Implicit and explicit emotion regulation in adolescents with dispositional optimism

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ABSTRACT

The development of adaptive emotion regulation (ER) plays a pivotal role in adolescent mental health and socio-emotional adaptation. Dispositional optimism, as an important protective factor for adolescent adjustment, may affect adolescent ER and subsequently influence adaptive outcomes. In this review, the changes and challenges, the role of ER in socio-emotional adjustment, and the developmental characteristics of implicit and explicit ER during adolescence are described. Subsequently, by employing the top-down model of personality, coping, and emotion, how dispositional optimism may affect psychological adjustment from the perspective of ER is analyzed. Furthermore, how the differences in adolescents’ dispositional optimism may be reflected by the differences in implicit ER is discussed. Finally, recommendations for future research are outlined.

1 Introduction

Adolescence is a distinct period, which comprises extensive changes in multiple domains of functioning that are characterized by emotional instability, emotional dysregulation, and a heightened risk for psychopathology in comparison to childhood and adulthood. Psychopathology in adolescence may have adverse and prolonged effects on individuals’ health and psychological adjustment. Research has revealed that the onset of psychopathology in adolescence may predict poorer outcomes in adulthood significantly [1–3]. Therefore, the development of adaptive emotion regulation (ER) is assumed to play a key role in adolescents’ mental health and socio-emotional adaptation. ER comprises monitoring, evaluating, and modifying emotional responses in accordance with an individual’s goals [4, 5]. In relation to the degree of awareness and cognitive efforts involved in emotion-regulatory processes, ER processes can be placed on a continuum that...
ranges from implicit, that is, non-conscious and automatic, to explicit, namely, intentional and controlled, processes[4, 6]. Adolescence may be regarded as a pivotal period for the development of ER [7].

Segerstrom and Smith’s top-down model of personality, coping, and emotion [8] posits that personality may exert effects on specific ways in which individuals regulate and respond to emotions, thus affecting adaptation outcomes [9, 10]. Dispositional optimism, which may be defined as the tendency to have positive or negative expectations about the future, may be regarded as important positive psychological capital and thus, has been deemed to protect adolescents from associated psychopathology [11, 12]. Moreover, adolescents’ optimism is associated with enhanced socio-emotional and psychological adjustment in that optimistic adolescents tend to experience more positive emotions and fewer negative emotions, enjoy enhanced social and academic competence, and pursue higher goals and career opportunities [13–15]. From the perspective of Segerstrom and Smith [8], dispositional optimism may affect adolescents’ ER, and then influence adaptive outcomes. Although only a few studies have explored the relationship between dispositional optimism and ER directly, these studies have revealed similar findings. While higher levels of optimism are associated with a more habitual use of adaptive ER strategies, higher levels of pessimism are related to a more habitual use of maladaptive ER strategies [16–19]. As the habitual use of ER strategies prompts real-time ER unintentionally when confronted with emotional situations, the habitual use of specific regulatory strategies are considered to be a form of implicit ER [20, 21]. In this regard, optimists and pessimists’ different adaptation outcomes may result from differences in implicit ER. In addition, theoretical and empirical evidence from neurodevelopmental studies has shown that in adolescence, the development of the neural circuits involved in explicit ER, which relies on the development of cognitive control system, is immature and later than the development of those underlying implicit ER [22–24]. Therefore, it may be inferred that explicit ER that requires cognitive resources may not differ among optimistic and pessimistic adolescents. Rather, the differences may be due to the use of adaptive and maladaptive implicit ER. An understanding of the underlying mechanisms involved in differences in ER between optimistic and pessimistic adolescents could provide a basis for targeted interventions to promote adolescents’ mental health, particularly that of pessimistic adolescents.

Accordingly, we reviewed the implicit and explicit ER of adolescents with dispositional optimism integrating evidence of behavior, psychological processes, and neurodevelopment. This review comprises three sections. First, the changes and challenges, the role of ER in socio-emotional adjustment, and the developmental characteristics involved in implicit and explicit ER during adolescence are described. Second, by employing the top-down model of personality, coping, and emotion [8], how dispositional optimism may affect psychological adjustment from the perspective of ER is analyzed. Furthermore, how the differences in adolescents’ dispositional optimism are reflected by the differences in implicit ER in accordance with profiles of adolescents’ implicit and explicit ER are discussed. Finally, recommendations for future research are made.

2 Adolescent development and emotion regulation

Adolescence is often referred to as a period of storm and stress [25] because of the extensive
changes in their physiological features, psychological development, and social interactions. These changes include puberty-related hormonal changes that lead to the development of secondary gender characteristics, considerable body size and composition changes, rapid brain development, an increased drive for independence, and heightened salience of social and peer interactions [26–28]. These changes may expose adolescents to emotionally challenging situations more frequently. Furthermore, they may react to emotional-eliciting stimuli more intensely and experience acute and negative emotions more frequently [29, 30]. Adolescents’ intensification of emotional experiences has been proposed to be the basis of psychopathology associated with the dysregulation of emotions [31, 32]. Therefore, one may deduce that learning to regulate emotions effectively may play a core role during the maintenance of well-being and social adaptation in adolescence [28, 33].

Individuals can choose various ER strategies to regulate their emotions. These strategies may be classified as adaptive and maladaptive. While the former include cognitive reappraisal, acceptance, and positive refocusing, the latter comprise rumination, catastrophizing, self-blaming, and withdrawal in accordance with their effects on emotional indicators and psychological adjustment. Individuals can implement ER strategies implicitly as well as explicitly [4]. Implicit ER is a goal-driven process in which individuals adjust their emotions unconsciously or automatically. Research in adults has revealed that in comparison to the explicit use of adaptive ER strategies, employing implicit ER with the same strategies can also reduce subjective experiences or physiological indicators of negative emotions without the substantial involvement of subjective endeavors and consumption of cognitive resources [34–37]. In contrast, because the processes of explicit ER are associated with greater cognitive and physiological costs than those of implicit ER, the implementation of explicit ER may not always be successful and realize positive effects in regulating emotions [20]. Although only a paucity of research has compared the regulatory effects of implicit and explicit ER among adolescents, by combining the convergent results from adult samples, one can infer that employing adaptive ER strategies to regulate emotions implicitly without consuming cognitive resources may be an important way for adolescents to maintain mental health.

Neurodevelopmental research provides a beneficial mechanistic perspective on adolescents’ increased vulnerability to psychopathology and portrays the developmental characteristics of implicit and explicit ER during this period. The dual system model is a prominent theory of the development of the brain during adolescence. This model posits that in the process of adolescents’ brain development, there is a mismatch related to the maturity between the subcortical limbic systems responsible for emotional reactivity and prefrontal regions responsible for top-down regulatory control in comparison to that of adults and children [22, 23, 38]. Although the development of subcortical limbic systems peaks during adolescence, their prefrontal regions are still maturing [22, 23, 38]. Thus, one may deduce that adolescents’ intense emotional experiences and high emotional reactivity may result from the peak development of the subcortical limbic systems. On the contrary, emotional dysregulation may be associated with the differential pace between the peak development of subcortical limbic systems and underdevelopment of prefrontal regions related to cognitive control. Research has supported this view [24, 39].

The difference between cortical and subcortical maturation could explain the heightened
vulnerability to psychopathology during adolescence. Furthermore, it is thought that this should be present in other typical age changes related to self-regulation [40]. ER is an important aspect of self-regulation. Implicit ER is an unconscious self-regulation process, which is conducted by the functional connectivity of the medial prefrontal (mPFC)-subcortical limbic regions. Explicit ER, on the other hand, is a demanding self-regulation process that is served mainly by the lateral prefrontal cortex [7, 24, 28, 41]. Theoretical and empirical evidence has shown that the development of neural circuits that advance implicit ER occurs before that of those underlying explicit ER [7, 23, 24, 42]. From a developmental perspective, in comparison to children, adolescents’ ER processes become more internalized and automatic. Unlike that of children, adolescents’ ER no longer depends on the assistance and guidance of parents or others [7, 43]. Moreover, due to the immature development of the top-down cognitive control systems in adolescence and cognitively demanding nature of explicit ER, adolescents may experience difficulty implementing explicit ER continuously, as that of adults [6]. Therefore, implicit ER, which is implemented by the developed neural circuit without the mandatory involvement of the inhibitory control system, may play a prominent role in adolescents’ ER in general.

3 Dispositional optimism and emotion regulation

Dispositional optimism is a historical and vital topic that has been rooted in both folk wisdom and expectancy-incentive motive theories for more than a century [44]. Research on dispositional optimism was first conducted in the 1980s and with the rise of positive psychology, enjoyed more scientific focus [45]. The personality dimension of optimism versus pessimism is defined as one’s general positive or negative future expectations. Although dispositional optimism is a cognitive trait, it has an encompassing effect on individuals’ emotions, motivation, and behavior [44]. With the exception of openness to experience, dispositional optimism was thought to overlap with the other four factors of the Big Five personality factors, namely, extraversion, neuroticism, agreeableness, and conscientiousness [46, 47]. However, research revealed that in comparison to the Big Five personality traits, dispositional optimism has a more unique predictive effect on individuals’ adjustment outcomes [48, 49]. The connotations and unique predictive effect of dispositional optimism cannot be replaced by other personality traits [44, 50]. Therefore, the study of dispositional optimism is significant. The sustained vitality of dispositional optimism research is also inseparable from the extensive impact thereof on individuals’ adaptive outcomes. A variety of studies have revealed that optimists whom researchers regard as perceiving the world with rose-colored glasses experience more positive emotions, less depression, higher subjective well-being and relationship satisfaction, and lower mortality [11, 12, 51–53]. Optimism is regarded as an important psychological capital for individuals to maintain positive emotions, physical and mental health, and subjective well-being as well as realize growth from disasters and uncertainties, especially during times of uncertainty such as the COVID-19 pandemic [54, 55]. During this period of storm and stress [25], dispositional optimism has special significance for adolescents’ socio-emotional adaptation. The rapid and immense changes in multiple domains of functioning during adolescence inevitably leads adolescents to suffer much pressure. As an important positive psychological capital, dispositional
optimism can serve as a buffer against the adverse effects of pressure. Studies have found that adolescents’ higher level of optimism may result in less depression and anxiety as well as higher life satisfaction [12, 52, 53, 56].

Research has found that optimism may be associated with enhanced physical and psychological well-being for individuals across nations and life stages [11, 12, 51–53, 57, 58]. However, one may ask how dispositional optimism affects psychological adjustment. The top-down model of personality, coping, and emotion [8] provides a useful framework for understanding the underlying mechanisms related to the relationship between dispositional optimism and adaptive outcomes. This model posits that dispositional optimism, as an important personality trait, may exert effects on specific ways in which individuals regulate and respond to emotions, thus affecting adaptive outcomes. Optimists believe in positive outcomes in the future, so they are more inclined to adopt adaptive ER strategies such as acceptance and positive cognitive reappraisal when they encounter stressful situations or negative emotions in an endeavor to reduce negative emotions, and promote problem-solving and socio-emotional adaptation. In contrast, as pessimists hold negative expectations for the future, they do not believe that their future will have positive outcomes. Therefore, when they encounter pressure or negative emotions, they are more inclined to adopt maladaptive strategies such as avoidance and catastrophizing to cope with pressures or negative emotions. Not only can maladaptive strategies not eliminate threats and pressures from a long-term perspective, but they may aggravate negative emotions such as intense anxiety, which is not conducive to individuals’ socio-emotional adaptation [50].

A number of empirical studies have found that while higher levels of optimism are linked to the more habitual use of adaptive ER strategies, higher levels of pessimism are related to the more habitual use of maladaptive ER strategies [16–19]. This habitual use of ER strategies is regarded as a form of implicit ER [20]. Thus, one may deduce that optimists and pessimists may experience differences in implicit ER. As noted previously, since implicit ER may play a prominent role in adolescents’ ER in general, one may infer that these differences in ER may be mainly reflected in implicit ER, which may lead to differences in adaptive outcomes between these two groups.

4 Conclusions and prospect

In the first section of this review, developmental characteristics of adolescence and adolescents’ implicit and explicit ER were described. Subsequently, theoretical and empirical evidence related to how dispositional optimism affects adolescents’ psychological adjustment from the perspective of ER was presented. It was further inferred that differences in adolescents’ dispositional optimism were reflected by their differences in the use of implicit ER. An understanding of the underlying mechanisms of differences in ER between optimistic and pessimistic adolescents could benefit future potential interventions in order to maintain and promote adolescents’ mental health, especially those who suffer pessimism.

There are several recommendations for future research. First, it is necessary to explore the effectivity and adaptability of implicit and explicit ER systematically in optimistic and pessimistic adolescents from behavioral, psychological, and neurobiological perspectives. This is important in relation to the maintenance, cultivation, and development of adolescents’ socio-emotional adaptation and positive personality. Second, it is recommended that the differences of ER between
optimistic and pessimistic adolescents be explored by employing the model of emotion regulation processes [5] in order to realize a comprehensive picture of adolescent ER characteristics along the optimistic and pessimistic continuum. Third, the developmental mechanisms underlying the implicit and explicit ER of adolescents with dispositional optimism should be examined by combining longitudinal behavioral and neuroimaging studies. This line of studies will facilitate the design of interventions to promote well-being and cultivation of positive personality during adolescence.

**Conflict of interests**

The authors declare no conflict of interests in this work.

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