Proceedings of the International Conference on Global Politics and Socio-Humanities
DOI: 10.54254/2753-7048/23/20230503

The Symptomatology and Psychosocial Risk Factors in Developing Callous-Unemotional Trait During Childhood and Adolescence

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Abstract: This paper reviews the current literature on the symptomatology and underlying psychosocial mechanisms for developing callous-unemotional (CU) traits across childhood and adolescence. CU traits include a lack of empathy, interpersonal callousness, and restricted affection. As much research has posited its crucial relatedness to multiple psychopathologies, including antisocial personality disorder, there is a pressing need for a more sophisticated understanding of the etiology, enabling the development of early interventions for CU traits. The current paper considers three aspects in its contribution to the etiology of CU traits: traumatic life events, parental influences, and interpersonal relationships. Current knowledge suggests that although the direct association between childhood maltreatment and CU traits is evident, many underlying mechanisms remain unknown. Additionally, parent influences may exert influence via insecure attachment relationships between infant and caregiver, affecting the internal working model, and via low childhood anxiety and harsh corporal punishment. The symptomatology of CU traits may also be consolidated by actively seeking to affiliate with deviant peers in school. These actions further reinforce their problematic belief in the social acceptance of aggressive behaviours to solve problems. This paper provides some reference for research in related fields. Future research should further elaborate on the potential implication of gender differences in literature; the psychosocial findings should incorporate the genetic-biological perspective in forming an integrated and coherent understanding of CU traits; and research should continue to address the potentiality in the clinical implication of research findings to develop valuable interventions for relevant psychopathologies.

Keywords: callous-unemotional traits, psychosocial perspective, adolescents

1. Introduction

Callous-unemotional (CU) traits have frequently been linked to multiple psychopathologies, including emotional problems (such as anxiety and depression), antisocial personality disorder (APD), and conduct disorder. Evidence has revealed the CU traits observed during childhood to be the precursors for psychopathic traits in adulthood [1]. Indeed, the mental health problem is never an individual battle; it also holds a broader effect on global societies. For instance, conduct disorder,

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defined as showing a consistent pattern of aggressive and disobedient behaviors, often cooccurs with delinquencies in children and teens and is related to antisocial behaviors, often bringing substantial financial burdens to society [2]. More concerning is that psychopathy is often considered as one of the most challenging psychopathologies due to a lack of efficient medication or therapies in the current era. Thus, there is a surge of research devoted to developing early interventions for psychopathy by understanding the complex constellation of CU traits.

In fact, research had focused mainly on the characterizing CU traits and probing into the association between CU traits and multiple psychopathologies, including aggression. A recent study has found consistent evidence for CU traits mediating sexual abuse and emotional neglect to predicting juvenile aggression-related delinquency [3]. In addition, it had been found that CU traits are associated with more severe form of aggression problem and adolescent often lack transgression guilt for their acts [4]. Indeed, much of the research sought to develop a better model to understand CU traits and their roles in various criminal offenses. At the same time, few studies in psychosocial domain have attempted to identify the potential etiological pathways for developing CU traits as predispositions for the onset of psychopathologies. In this review, the discussion will be made precisely on symptomatology and the psychosocial domain of risk factors contributing to the formation of CU traits before adulthood. This paper argues that while childhood maltreatment is directly associated with CU traits, it is less clear on the reasoning behind the effect of childhood trauma on the etiological pathway of CU traits. Secondly, parental influence is a significant risk factor in damaging the emotional competencies of children and impeding the internalization process of social norms for children. Thirdly, peers at school may exert more influence on adolescents than parents. As a tendency had been observed in children with CU traits to affiliate with deviant peers, this may further aid the maintenance of CU traits and associating aggressive behaviors.

2. Callous-unemotional Traits and Psychosocial Risk Factors for Its Development

2.1. Definition of Callous-unemotional (CU) Traits and Its Connection to Antisocial Personality Disorder (APD)

Callous-unemotional (CU) trait is defined as an individual with a temperament dimension expressing a lack of empathy for others' suffering, interpersonal callousness, and restricted affection. Much of the current research has revealed its close connection to the most severe and aggressive forms of antisocial behavior [4]. Extensive research suggests that CU trait and conduct disorder are two significant predictors for later diagnosis of antisocial personality disorder (APD) [5]. Arguably, two predictors for APD interact with each other in contributing to specific externalized behavior patterns. Children with high CU traits and conduct disorder exhibit higher instrumental and reactive aggression levels. In contrast, children with sole conduct problems demonstrate reactive aggression, which is highly limited in severity. Interestingly, only instrumental rather than reactive aggression in preadolescents predicts later delinquency and disruptive behavior in mid-adolescence. As the CU trait stabilizes across late adolescence to early adulthood, it seems reasonable that most adolescents with conduct disorder are diagnosed with APD after reaching adulthood [5]. It is also worth mentioning that APD occurs along a spectrum, which means it ranges in severity regarding committing crimes. Psychopathy is characterized as a severe subtype on the broad spectrum of APD, which the literature often associates with high CU traits. Nevertheless, antisocial, in general, varies in levels of CU traits.

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2.2. Symptomatic Expressions for CU Traits in Children and Adolescents

2.2.1. Deficit in Cognitive-affective Processes

Adolescents with CU traits exhibit heterogeneous behaviors suggesting deficits in socio-affiliative processes, including interpersonal indifference, lack of remorse, and low fearfulness. A recent study by Vasconcelos and colleagues asked participants to rate the guilt they would feel and the wrongness of demonstrated act if they were to perform it [6]. And they found a significant interaction between CU traits and anticipated guilt when judging wrongness, while there was a diverging trend between moral judgment and anticipated guilt with high CU traits in the adolescent sample. Specifically, they reported that adolescents felt less guilty and made fewer wrong judgments on the given scenarios. Plus, adolescents who obtained a higher score in self-report cease to exhibit an increase in wrongness rating, as the rating of anticipated guilt increases across scenarios. These results are consistent with other research which has revealed the lack of transgression guilt and moral dysfunction in adolescents with CU traits, and it has a potential implication in behavior regulations [5]. Moreover, as it is proposed that affection processing might be the problem behind the noncompliance of the moral norms often seen in high CU traits adolescents, Vasconcelos et al. added that participants higher in CU traits took longer to respond to a wrongness rating when anticipated guilt was high, compared to participants low in CU traits [7]. It infers and is well-supported by research that they may have employed a different route that requires less emotional loadings [6]. Subsequently, as the externalized representation of cognition, this different moral processing is expected to modify behaviors. Indeed, moral emotions, such as guilt, are hypothesized to be prominent in regulating appropriate social behaviours. For instance, the feeling of guilt provides on-the-spot and salient feedback on behaviors, either imagined or executed. It is this personal experience with moral emotions that helps individuals identify the moral insinuation of their judgment and behaviors.

Additionally, low empathy or disregard for others is exhibited consistently in children and adolescents with CU traits. Empathy comprises two components: affective and cognitive. Affective empathy refers the ability to resonate with others' emotions, while cognitive empathy is defined as the ability to model the emotional states of others (i.e., perspective-taking). Interestingly, as a large amount of empirical data supports the argument that both children and adolescents high in CU traits are expected to see deficits in affective empathy, the result is less consistent in cognitive empathy, with some found statistical significance for the competent cognitive empathy in older boys at the age of 12 [2, 5].

Another critical characteristic consistently seen in adolescents with CU traits is the fearless temperament or insensitivity to punishment cues. It may appear intuitive as it is reasonable to assume that someone who grew up in an abusive environment developed low fearfulness as a potential defensive mechanism [1]. Nevertheless, the study also revealed a strong genetic predisposition for preschoolers' temperamental fearfulness [4]. Additionally, a functional brain imaging study added that the low fearfulness may be due to the hypo-reactivity in the amygdala while encountering other's stress. A temperamental fear is the innate tendency to react with fear in threatening situations. Some studies also attempted to discern and identify the incapability between each process needed to induce fear response ultimately. Children high CU traits have demonstrated issues identifying fearful and sad facial expressions. Moreover, this temperament may contribute to the frequent thrill-seeking behaviours generally observed across adolescents with high CU traits [4].

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2.2.2. Limited Prosocial Behaviours and Relative Interpersonal Deficits

Another crucial presentation of CU behaviors is the limited prosociality. CU behaviors often indicate a disrupted development of both empathy and prosociality in children. From a developmental perspective, well-developed children are expected to start displaying prosocial behaviors and empathic concern for others around the age of two. Prosociality refers to a response to another's need to offer assistance or comfort and often stems from empathy with either altruistically motivated or self-serving motivation. Regardless of the purpose for the action, a strong association between CU traits and low prosociality (i.e., callousness) across age, sex, and type of measurement has been observed [2]. The meta-analysis reveals that individual high in CU traits often demonstrate low prosociality in preschool years, thus has a potential clinical implication for early intervention. Furthermore, a study has investigated the association between CU traits and friendship; the result suggests that CU traits were notably related to lowered quality of friendship [7]. Consequently, empathy, guilt, and conflict resolution, the essential interpersonal and affiliation processes that contribute to maintaining healthy and high-quality adolescent friendships are largely diminished in the daily affiliation process of adolescents with CU traits. This indicates that the CU traits have a potential long-term effect in affecting the development of thriving adolescent socialization, and further exploiting adolescents' opportunities to cement their cooperation and perspective-taking skills. But does this make them incapable of making friends? On the contrary, antisocial adolescents with high CU traits are less likely to develop a deficit in verbal intelligence than CU-trait-absent antisocial adolescents, this put them at less disadvantaging place while making friends. Additionally, a study also revealed that adolescents high in both CU traits and high executive function are well-liked by peers [4]. Similar to these studies, researchers reported that school-age children with high "Machiavellianism" are also well-liked among peers [8]. Together, other mediators or variables should be accounted for when understanding the interpersonal/social life of an antisocial psychopath.

2.3. Different Approaches in Explaining the Etiology of CU Traits Across Adolescence

2.3.1. Traumatic Experiences

Few empirical and theoretical studies examined the potential association between childhood maltreatment and CU traits. Only recently, Joyner and Beaver added robust empirical evidence for the direct association of childhood maltreatment and the scores on the callous-unemotional traits scale [1]. Specifically, individuals who reported having experienced childhood maltreatment received higher scores on the callous-unemotional trait scale. Moreover, the result provides informative evidence that childhood maltreatment may predict future CU traits more accurately in males than females. It also appears that the perpetrator's identity does not inflict different results in predicting CU traits [1]. Joyner and Beaver also found inconsistent results on the involvement of genetic factors in mediating the effect between the two variables [1]. The indirect method of testing in the study reported that genetic factors could have played a less significant role in mediating the effect between the two. Unfortunately, the reasoning behind this direct association is poorly understood, except a possible explanation suggesting that the callous-unemotional trait is developed as an adaptive strategy to stressful life experiences [1].

2.3.2. Parental Influences

Extensive research argues that CU traits emerge as early as the infant years. Stern and Cassidy proposed that a secure parent-child relationship is the fundamental basis for inquiring about positive models of others, thus supporting empathy development within a child [9]. According to Stern and

DOI: 10.54254/2753-7048/23/20230503

Cassidy's work, these early patterns of interaction between infant and caregiver around the active management of infant distress instilled the mental representation of social relationships, enabling the gradual formation of Internal Working Models (IWM). The IWM was first introduced to address the influence of early attachment experiences on the later social functioning of individuals [9]. The model is designated to comprise the cognitive frameworks in processing social information, informing physiological and emotional responses to threats, and guiding corresponding social behaviors across development. It is informative in suggesting that painful experience with the caregiver for their inconsistent or rejecting responses contributes to children's distress and thus forms insecure models of relationship. The children then begin to categorize self and others as unworthy of care and love and develops a general view that negative emotion is unacceptable and overwhelming [9]. Thus, it is likely that children high in CU trait had failed to acquire more functional ways of regulating emotions (e.g., distress) during their early life stage. Moreover, their emotion competency (e.g., affective resonance, self-regulation) is somewhat compromised compared to their peers.

On the other hand, low childhood anxiety in toddler years and high levels of corporal punishment are also associated with maintaining underdeveloped emotional empathy, limited behavioral expression of concern toward the suffering of others, and a low level of moral internalization. According to Kochanska, developmental theorists have reasoned that the development of moral socialization and internalization of societal norms in a child depends partially on negative feedback, like arousal [10]. The arousals following potential punishments after misbehaving are particularly important for a child to learn about anxiety and guilt [4, 10]. The anxiety then allows the development of empathic concerns for others, which is much diminished in individuals with high CU traits. Subsequently, high levels of corporal punishment act as a handicap in internalizing parents' prosocial messages and may lead to the misconception that punishment is an acceptable means of controlling others [4]. In fact, adolescents with CU traits share a similar social informational processing bias and cognition bias as adolescents with aggression. Particularly, adolescents anticipate more positive outcomes in aggressive situations and are more prone to consider aggression a valid strategy to solve difficult situations. Taken together, the deficits in guilt and empathy (e.g., emotion competency) and the presence of CU traits make the child more vulnerable to acting aggressively. Therefore, it is much more difficult to halt and manage aggressive behaviors and not be diagnosed with conduct disorder in adolescents.

2.3.3. Peer Rejection and Affiliation with Deviant Peers

When children reach school age, empirical evidence suggests that the impact of peers may have an even greater impact on children than parents, especially at a younger age in adolescence [7]. Researchers warned that as children high in CU traits are at a higher risk of making friends with delinquent peers and are much disliked by classmates at age 10, some problematic beliefs in the social acceptance of antisocial behavior may be positively reinforced by interacting with deviant peers [8]. Notably, this phenomenon of peer rejection extended into late adolescence. Adolescents have reported perceiving relatively high levels of peer rejection and feeling less connected to the school and classmates [11]. One of the possible reasons for the effect of peer rejection on the etiology of CU traits could be an identity crisis. Boduszek and colleagues proposed an integrated psychosocial criminal social identity model, arguing that it involves four psychosocial factors for an individual to form a criminal /antisocial social identity [12]. The first factor is the identity crisis, as an individual experiences peer rejection, poor supervision, and poor parental attachment. Essentially, these experiences weaken one's bond with society. The second factor posits the importance of environmental exposure to delinquencies through association with deviant friends. The third factor is the drive to identify with a delinquent group in preserving self-esteem. Finally, the fourth factor is

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the moderation of personality traits when interacting with an antisocial environment and developing an antisocial social identity [12]. Therefore, as an individual with an affiliation goal in mind, it increases mimicry in behaviors [13]. In this case, it is highly likely that adolescents are encouraged under the influence of peer rejection, poor parental attachment, and affiliation with deviant peers to develop antisocial social identity and thus reinforce relevant antisocial and CU behaviors.

3. Limitations and Suggestions for Future Research

Previous studies have also analysed the formation of CU traits from genetic and other perspectives. The genetic heritability is estimated to be between 36-67% across relevant research studies. This heritability increases the possibility that youth may inherit some genetic pre-acquisition from their parents and thus are more vulnerable in developing the CU traits. It seems evident that genetic predisposition accounts a large portion for the etiology of CU traits, while heritability explains 43.6% of the variance in the developmental course of the CU trait [14]. Further, brain-imaging studies reveal that dorsal and ventral prefrontal cortex, amygdala, and angular gyrus are either functionally or structurally impaired in psychopathic (a subgroup of antisocial individuals) individuals [15]. As these brain structures play central roles in functioning, moral cognition, and emotion, the symptoms of CU traits shall emerge with these relevant brain damages. Future studies should incorporate relevant approaches, such as developmental models and molecular genetic investigation of CU traits, to emerge new insights and elucidate the specific accountability of psychosocial risk factors in explaining variance for the etiology of CU traits. For now, a lack of study has attempted to bring the two approaches together.

On the other hand, an emerging body of evidence highlights possible sex differences regarding CU trait-related studies. It seems problematic in generalizability as most previous studies used mainly male participants [3]. Similar findings are found that there is a sex difference in the variation of hemodynamic response within the insula when one views others being harmed [16]. Specifically, the bilateral anterior insula volume was found associating with level of CU traits in boys only, implying that sex is an essential factor to consider in future studies. Another aspect that needs to be considered is the ever-changing relationship between CU traits and different psychosocial factors across several developmental stages. Although extensive research explores different aspects of CU traits, it would be beneficial if different risk factors for each developmental stage could be categorized and reasoned into a single piece of work. Several aspects need to be addressed in advance, including the development of CU traits during the transitional stage between adolescence and adulthood, examining and developing models for explaining research result, such as child abuse and CU traits, and clarifying mixed results in the literature, such as the role of CU traits in cognitive empathy. The latter can be further dissected by separating perspective-taking skills from the relevant inventory of testing cognitive empathy to deepen the current understanding on the sociocognitive perspective.

Eventually, future study should elaborate empirical data into clinical implications. For instance, given that there is a tendency of children with CU traits to affiliate with delinquent peers, and the resulting environment also aid to form criminal identity. It holds the potential implication in intervening the etiology of externalizing behaviors in adolescents with CU traits, including impulsivity and aggression. Despite there is less direct evidence testing the association which requires further inquiry, research directs that improvement in adolescent environment or adolescents' interpersonal relationship quality is needed. Furthermore, as insecure relationship is hypothesized for forming the fundamental basis of future callous-unemotional traits in pre-schoolers and is characterized by low prosociality and limited empathy. Local organizations may offer emotional guidance and feedback as early as possible in attempt to minimize the damaging effect from child's primary family.

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4. Conclusion

In conclusion, this paper addressed the gap in literature by discussing three mainstream approaches in psychosocial domain explaining the possible etiological pathways of callous-unemotional (CU) traits, traumatic experiences, parental influences, and peer rejections/interpersonal relationships. It seems doubtful how exactly traumatic experiences interact with the development of CU traits, nonetheless, child maltreatment is associated with a higher risk of developing CU traits. Parental influences, however, are slightly better understood. The parent-child attachment theory is applied to explain the fundamental basis for developing CU traits in children. The insecure relationship is thought to disturb the normal internalisation of social norms and parent norms. Thus, researchers suggested this may have a long-term disturbing effect on the socio-affective dimension of children, as it leads to children acquiring compromised emotion competencies (e.g., affective empathy, emotion regulation). These deficits then predispose children to the development of CU traits. Additionally, low childhood anxiety and high corporal punishment, presumably from parents, are strong evidence for associating with the onset of CU traits. Finally, relevant research has highlighted the crucial influence of peer rejection and problematic interpersonal relationships with deviant peers in adolescence for strengthening and maintaining CU traits across adolescence. This paper can provide some reference for research in related fields.

Furthermore, the current review suggests future studies should focus on resolving inconsistent results in the literature, for instance, cognitive empathy and its relation to CU traits. Research is also needed in exploring the underlying mechanism for the direct effect of child maltreatment on CU trait onset. Meanwhile, investigating the role of sex differences and updating relevant findings in this field are equally important. Last but not least, it is essential to integrate relevant evidence in biological, genetic, and developmental models to give a more sophisticated model accounting for the etiology of CU traits across developmental stages. And finally, future studies should extend to real-life implications in clinical settings.

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