OPEN ACCESS

GAVIN PUBLISHERS

International Journal of Autism & Related Disabilities

Matchett EA. Int J Autism & Relat Disabil: IJARD-138.

DOI: 10.29011/2642-3227.000038

Review Article

Emotion Regulation and Social Participation in Childhood and Adolescence: Systematic Review

Emily Ann Matchett, Mollie Ripple, Monica Militar, Hanan Khalil, Holly Scarborough, Karen Ratcliff, Claudia Hilton*

Occupational Therapy Department, University of Texas Medical Branch, USA

***Corresponding author:** Claudia Hilton, Occupational Therapy Department, University of Texas Medical Branch, USA

Citation: Matchett EA, Ripple M, Militar M, Khalil H, Scarborough H, et al. (2020) Emotion Regulation and Social Participation in Childhood and Adolescence: Systematic Review. Int J Autism & Relat Disabil: IJARD-138. DOI: 10.29011/2642-3227.000038

Received Date: 15 September, 2020; **Accepted Date:** 30 September, 2020; **Published Date:** 07 October, 2020

Abstract

Background: Social participation is important for quality of life and flourishing and is a problem for many children. It is not clear which skills, other than social skills, might support social participation. This review summarized the literature examining the relationship between emotion regulation and social participation in children and adolescents.

Method: An exhaustive literature search was performed using the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines. Records were identified through Google Scholar, PubMed, Scopus, Cochrane and PsychInfo databases. Inclusion criteria for this systematic review allowed for participants aged zero to 21 years old in articles published in the last 10 years. Typically, developing participants and those with a variety of diagnoses were included.

Results: Thirteen of the 14 reviewed studies found significant relationships between emotion regulation and social functioning. Nine found correlations between emotion regulation and social competence and four found emotion regulation to be a predictor of later social competence. Emotion regulation themes specifically related to social participation were: were general emotion regulation strategies, self-awareness, temperament, emotional control/lability, and use of specific emotion regulation strategies.

Conclusions: Emotion regulation skills are related to a child's social participation. Additionally, emotion regulation skills early in life may be predictive of later social competence. This systematic review found moderate evidence to support these relationships. Emotion regulation skill development in conjunction with social skills training for children and adolescents with social participation difficulty provides a more holistic strategy to address social participation challenges.

Keywords: Behavior regulation; Emotion regulation; Self-regulation; Social competence; Social skills

Introduction

Emotion regulation is defined as the process of managing and modifying one's internal state and/or outward behavior in different situations [1]. It is demonstrated when an individual remains in control when things do not happen as planned, when the individual remains calm during stress, and while the individual is navigating social interactions. The construct of emotion regulation has been developed from several psychological disciplines contributing to life experiences which include health, personality, cognitive, developmental, clinical, biological and social psychology.

Emotional regulation includes how people decide which emotions to express, when and how they are influenced by emotion, and the way they choose to express emotions. How an individual approaches emotions, acceptance, tolerance, and access to emotion regulation strategies is crucial to positive interaction with life circumstances and behaviorally adapting to meet one's needs [2]. Emotion regulation supports self-regulation which promotes changes of behaviour to obtain goals [3]. Emotion regulation is intricately intertwined with one's behavioral responses and implicated in difficulty navigating social interactions [4]. Social and emotional development are at the core of growth and development [4] and vital for social competence, quality of life, and ultimately, are important for one's ability to flourish [5]. Previous related reviews have focused on the relationship between emotion regulation and aggression [6], emotional intelligence and aggression [7], and measures of social and emotional skills in children [8]. Other reviews have evaluated different aspects of emotion regulation [9-11], but none have

explicitly examined the relationship between emotion regulation and social participation. Because of the importance of emotion regulation and social interaction for flourishing, the focus of this review is to examine the relationship between emotion regulation and social participation. Difficulty with emotion regulation negatively impacts an individual's coping skills and functioning, causing difficulties in cognitive flexibility, emotional transitions, and self- reflection [12]. Chronically, emotion dysregulation is associated with mental illness symptomatology. Adolescents with reduced emotion regulation experience increased symptoms of depression and problem behaviors [13]. Childhood dysregulation, even before early manifestation of a psychiatric disorder, increases the risk for adulthood substance use, suicidal ideation and behavior, and overall decline in functioning [14]. In contrast, mature and positive emotional and social skills are related to improved self-efficacy in adolescence [15].

The ability to regulate emotions is a critical factor for a child's classroom success [16,17]. Rydell, Thorell and Bohlin (2007) [18] found that children who were unsuccessful in managing their emotions adopted more aggressive behaviors in school settings, as well as in other specific social functioning contexts. Additionally, ineffective regulation of negative emotions, specifically fear, is linked to behavior problems and high social anxiety in young children [19]. Furthermore, emotional and social skills during the transition to kindergarten are foundationally predictive of future social and academic functioning in a school setting. Early school adjustment is influenced by the child's positive social experiences, with each positive social experience having a cumulative contribution [20]. These studies support the importance of children's social and emotional skill development because of their strong influence on school functioning. It is important to examine the relationship between the components of emotion regulation and social participation. For this paper, emotion regulation will be defined as the process of managing and modifying one's internal state and/or outward behavior to meet contextual demands and personal needs. The purpose of this systematic review was to better understand the constructs that comprise emotion regulation that are related to social participation. With this information, practitioners will be better prepared to develop interventions targeting specific emotion regulation skills in children.

Methods

This literature search was conducted by a research team using the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines from the American Occupational Therapy Association [21]. Searches were conducted in Google Scholar, PubMed, Scopus, Cochrane and PsychInfo databases. Search terms included the population and the variables. The population was defined using search terms such as <children OR child* OR pediatrics OR adolescence OR adolescents OR school aged>. The variables were emotion regulation and social skills impairment. Emotion regulation was searched using the key words, emotional regulation, self- regulation, dysregulation, emotion, or emotional intelligence. Social participation was searched using the key words, social skills, social participation, peer relations, social competence, social impairment, or social awareness. (Figure 1) presents the search flow with number of initial records identifies through searching using the above terms, the number of records screened and assessed for eligibility based on inclusion criteria. The searches were limited to the most recent 10 years, from 2009 or later to ensure its current relevance for the pediatric population. Other inclusion criteria were children and/or adolescents, children with attention deficit disorder/attention deficit hyperactivity disorder (ADD/ADHD), Down syndrome, learning disabilities, Oppositional Defiant Disorder (ODD) and autism spectrum disorder (ASD). Studies involving adults and publications 10 years or older, systematic reviews, and articles that were not relevant to the review were excluded. Levels of evidence were determined based on the PRISMA guidelines from the American Occupational Therapy Association [21]. See (Table 1) for details about levels of evidence and (Figure 1) for Search Flow Diagram.

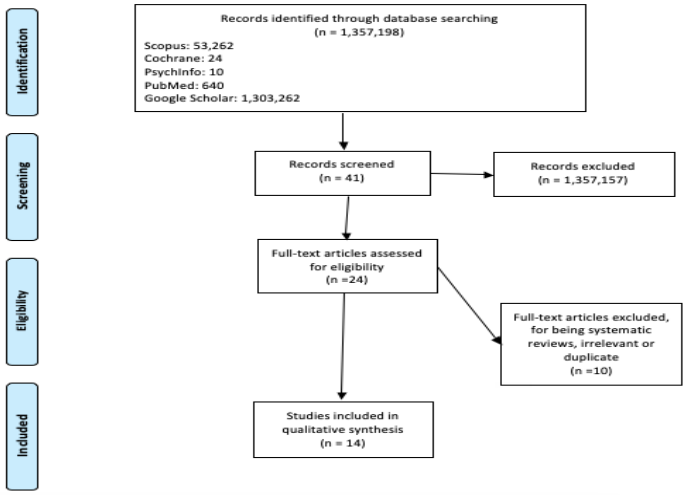

Figure 1: Search Flow Diagram.

From: Moher D, Liberati A, Tetzlaff J, Altman DG, The PRISMA Group (2009). Preferred Reporting Items for Systematic Reviews and *M*eta-*A*nalyses: The PRISMA Statement. PLoS Med 6(7): e1000097. doi:10.1371/journal.pmed1000097

Level of Evidence	Description
Level IA	Systematic review of homogeneous RCTs (similar population, intervention, etc.) with or without meta-analysis
Level IB	Well-designed individual RCT (Not a pilot or feasibility study with a small sample size)
Level 2A	Systematic review of cohort studies
Level 2B	Individual prospective cohort study, low-quality RCT (e.g., <80% follow-up or low number of participants; pilot and feasibility studies); ecological studies; and two-group, nonrandomized studies
Level 3A	Systematic review of case-control studies
Level 3B	Individual retrospective case-control study; one-group, nonrandomized pre-posttest study; cohort studies
Level 4	Case series (and low-quality cohort and case-control study)
Level 5	Expert opinion without explicit critical appraisal
Note. RCT = randomized controlled trial. From OCEBM Levels of Evidence Working Group. (2011). The Oxford Levels of Evidence 2. Oxford Centre for Evidence-Based Medicine. http://www.cebm.net/index.aspx?o=5653 See also https://www.cebm.net/2009/06/oxford-centre-evidence-based-medicine-levels-evidence-march-2009/	

Table 1: Levels of Evidence.

Results

Using Google Scholar, the initial search resulted in 1,303,262 articles and six articles were chosen for the review. An exhaustive search was done in the following databases. In PubMed, initial search results totalled 640 articles and two were chosen to review. In Scopus, 1071 articles were initially identified and three were chosen to review. The Cochrane search identified 24 initial articles and none were chosen to review because they were systematic reviews, irrelevant or duplicates. The PsychInfo search initially identified 10 articles and three were chosen. At the end of the search process, 14 articles met the inclusion criteria and were reviewed. Ten of the reviewed studies included participants who were exclusively from newborn to 12 years old [22-30]. Two of the studies examined exclusively adolescent participants from ages 12 to 21 years [31,32]. Two studies included participants who were both children and adolescents ranging from four to 14 years old [33] and five to 17 years old [34].

Levels of Evidence

Fourteen studies were included in the systematic review to examine the relationship between emotion regulation and social skills impairment among children and adolescents. Of the 14 reviewed articles, four were Level 2B [25,28,29,32] and 10 were Level 3B [22-24,26,27,30,31,33,34,], with no Level 1, 4 or 5 studies. Given that this systematic review is studying the relationship between two variables, Level 1 evidence would likely not be feasible because these studies cannot randomly assign emotion regulation ability or social participation.

Themes

The 14 articles collectively included 3,271 participants. Of the 14, 13 articles had results suggesting an association between emotion regulation skills and social skills and/or social participation. Nine of the studies found correlations between emotion regulation and social skills [22,24-26,28,32-34] and three studies found emotion regulation to be a predictor of social skills or indicators of social skills, such as peer acceptance or friendship quality [23,29,31] while one study found temperament soothability and shyness to predict peer relations rather than emotion regulation. The themes identified in the results of the studies were: use of general emotion regulation strategies, temperament, self-awareness, emotional control/lability and specific emotion regulation strategies. Table 1 displays more details about the articles reviewed. Following are descriptions of the themes, which are in order of the strength of evidence supporting them.

Author/Year	Level of Evidence Study Design Theme(s)	Participants Inclusion Criteria	Outcome Measures	Results
Spritz et al. (2010) [26]	3B Cohort study Emotional Control/ Lability General Emotion Regulation Strategies	44 participants 3.5 - 5.5 years old (43 - 67 months old)	*C-TRF* *SB:IV-4* *ERC* *STRS* *SSRS* Standard sociometric interview protocol developed by Denham & McKinley (1993)	Emotional lability and general emotion regulation scores were related to the child's social skills as rated by teachers. General emotional regulation was associated with student-teacher closeness and emotional lability was associated with student-teacher conflict.
Berkovits et al. (2016) [27]	3B Descriptive study General Emotion Regulation Strategies	108 participants 4 – 7 years old Diagnosis of ASD	ERC CBCL SSIS WPPSI-III CASL-2 SRS ADOS-2	Emotion dysregulation predicted increased social and behavioral difficulties across time whereas higher emotional regulation scores predicted improved social skills one year later.
Berkovits & Baker (2014) [28]	2B (longitudinal two groups) General Emotion Regulation Strategies	174 participants 113 typically developing 61 with developmental delay 7, 8 and 9 years old	SB:IV ERC CBCL	Emotional dysregulation was significantly correlated with teacher-rated and mother-rated social problems across ages 7 to 8 and 8 to 9 in the typically developing group alone. Overall a stronger relationship between emotional regulation and social outcomes were found in the typically developing group than in the developmentally delayed group.
Blair et al. (2015) [29]	2B (longitudinal cohort study) General Emotion Regulation Strategies	356 participants 5, 7 and 10 years old Children at risk for developing behavioral problems in the future	ERC SSRS Friendship Quality Questionnaire Sociometric nomination procedure created by the authors	Emotional regulation was predictive of social participation outcomes of peer acceptance and self-rated friendship quality.
McKown et al. (2009) [34]	3B 2 cohort studies General Emotion Regulation Strategies	284 participants 5 – 17 years old Study 1: 158 typically developing children between ages 4 to 14 Study 2: 126 clinic-referenced children between ages 5 to 17	CATS MEPEF Posture and gait recognition (Heberlein, Gla¨escher, & Adolphs, 2004, 2007) Strange Stories NEPSY II ToM Empathetic self-report scale adapted by Spinrad et al. (1999) CASL SSRS DAVNA TOPS BASC	Self-regulation via parent and teacher report was associated with social competence. Furthermore, self-regulation was a predictor of social competence.

Miller et al. (2010) [30]	3B Nonrandomized cohort study General Emotion Regulation Strategies	60 participants 3.4 - 5.2 years old 45% Caucasian, 17%	"The Observer" Emotional displays/ dysregulation codes (adapted from Miller & Olson, 2000) Social engagement codes (Fantuzzo, Coolahan, Mendez, McDermott, & Sutton-Smith, 1998) ERC SSRS CBS PBQ CAS	Observed dysregulated behavior in the classroom was associated with more social conflict behaviors.
Jankowski & Rękosiewicz (2013) [32]	2B 3 groups non-randomized study Self-Awareness	1151 participants 15 – 21 years old	DERS SPQ-S1	The study found that there is a relationship between social participation and emotion regulation by presenting the association between marginalization and segregation and lower emotional awareness. Conversely, higher levels of awareness were associated with assimilation.
Bunford, Evans & Langberg (2018) [31]	3B Cohort study Self-Awareness Emotional Control/ Lability	180 participants 12 – 16 years old Diagnosis of a subtype of ADHD Academic or social impairment IQ of 80 or above Do not meet criteria for diagnosis of pervasive developmental disorder, bipolar disorder, psychosis, substance dependence other than tobacco, or obsessive-compulsive disorder	P-ChIPS DBD IRS DERS ERICA CBCL SSIS-RS	In adolescents with ADHD, self-awareness was a significant predictor of self-rated and parent-rated social skills. Moreover, emotional control was a significant predictor of parent-rated social skills.
Seguin & MacDonald (2016) [35]	3B Cohort study Temperament	31 first grade students	ERC The Colorado Child Temperament Inventory The School Social Behavior Scale Second Edition	The study did not find a relationship between ERC emotion regulation constructs and social behavior. However, the emotionality was associated with social behaviors, in agreement with the findings of Garner and Waajid (2012)
Garner & Waajid (2012) [25]	2B 2-group cohort study Temperament	74 participants 3 – 5 years old Mean age 48.93 months old	DIAL-R CBCL SCBE TOCA-R Expressive labelling based on Iannotti (1985) 10 emotion vignettes developed by Michalson & Lewis (1985) Play assessment developed by Martin & Fabes (2001)	The positive emotionality aspect of self-regulation was associated with social competence both at home and in the classroom.

Goldsmith & Kelley (2018) [33]	3B One group, non-randomized Use of Specific Emotion Regulation Strategies	145 participants 5-17 years old Diagnosed with ASD	ERQ AQ	The demonstration of better emotion regulation through use of the strategy "reappraisal" was associated with less severe ASD symptoms and social impairments.
Trentacosta & Shaw (2009) [22]	3B Cohort study Use of Specific Emotion Regulation Strategies	122 males 8.2 - 10.7 years old	CBCL Delay of gratification cookie task (Marvin, 1977) Peer sociometric interview/ nomination procedure (adapted from Coie, Dodge, & Coppotelli, 1982)	Findings showed an association between emotion self-regulation strategy of active distraction and peer rejection and antisocial behavior. Peer rejection was associated with later antisocial behaviors.
Ogelman & Fetihi (2019) [23]	3B Randomly sampled cohort study Use of Specific Emotion Regulation Strategies	95 participants Mean age 5 years, 6 months old	SERS SSES Picture Sociometry Scale Child Behavior Scale	Emotion regulation strategies had predictive effect on coping with peer pressure, aggressiveness and social preference
Penela et al. (2015) [24]	3B Longitudinal study Use of Specific Emotion Regulation Strategies	257 participants Behavioral inhibition and temperament assessed at age 2 and 3 years old Emotional regulation strategies assessed at 5 years old Social competence assessed at 7 years old	Behavioral observations of the children's temperament, social competence and strategy use Play Observation Scale (modified) Disappointment Paradigm TBAQ	More active emotion regulation strategies (such as problem solving and cognitive restructuring) are associated with higher levels of social competence, specifically in children who are highly behaviorally inhibited.

Emotional Regulation Questionnaire (ERQ; Gross and John, 2003), Autism Quotient (AQ; Auyeung et al. 2008; Baron‐Cohen et al. 2006), Self-Reported Delinquency (SRD; Elliot, Huizinga, & Ageton, 1985), Social Skills Evaluation Scale (SSES; Avcıoğlu, 2007), Scale of Emotion Regulation Strategies (SERS; Gust, 2014), Toddler Behavior Assessment Questionnaire (TBAQ; Goldsmith, 1996), Developmental Indicators for the Assessment of Learning (DIAL-R; (Mardell-Czudnowski & Goldenberg, 1990), Social Competence and Behavior Evaluation (SCBE; (SCBE; LaFreniere & Dumas, 1996), Teacher Observation of Classroom Adaptation-Revised (TOCA-R; Werthamer-Larsson, Kellam & Wheeler, 1991), Emotion Regulation Index for Children and Adolescents (ERICA; MacDermott, Gullone, & Allen, 2010), Difficulties in Emotional Regulation Scale (DERS; Gratz & Roemer, 2004), P-ChIPS (Weller, Weller, Rooney, & Fristad, 1999), DBD (Pelham, Gnagy, Greenslade, & Milich, 1992), IRS (Fabiano et al., 2006), Social Participation Questionnaire - short version 1 (SPQ-S 1; Rękosiewicz, Brzezińska and Hejmanowski, 2013), Caregiver–Teacher Report Form for Ages 2–5 (C-TRF; Achenbach, 1997), Student–Teacher Relationship Scale (STRS; Pianta, 2001), Emotional Regulation Checklist (ERC; Shields and Cicchetti, 1995, 1997 & 2001), Child Behavior Checklist (CBCL; Achenbach and Rescorla, 2000 & 2001), Social Skills Improvement System (SSIS; Gresham and Elliott, 2008), Wechsler Preschool and Primary Scales of Intelligence, 3rd Edition (WPPSI-III; Wechsler 2002), Comprehensive Assessment of Spoken Language (CASL-2; Carrow-Woolfolk 1999), Social Responsiveness Scale (SRS; Constantino 2002), Autism Diagnostic Observation Schedule (ADOS-2; Lord et al. 2012), Social Skills Rating Scale (SSRS; Gresham & Elliott, 1990), Friendship Quality Questionnaire (Parker & Asher, 1993), Comprehensive Affect Testing System (CATS; Weiner, Gregory, Froming, Levy, & Ekman, 2006), Match Emotional Prosody to Emotional Face (MEPEF; Weiner, Gregory, Froming, Levy, & Ekman, 2006), Strange Stories (Happe´, 1994), NEPSY-II Theory of Mind (NEPSY; Korkman, Kirk, & Kemp, 2007), DAVNA (DAVNA; Nowicki & Duke, 1994), Test of Problem Solving (TOPS; Bowers, Barrett, Huisingh, Orman, & LoGiudice, 1991; Zachman et al., 1994), Behavioral Assessment System for Children (BASC; Reynolds & Kamphaus, 1992), Child Behavior Scale (CBS; Ladd & Profilet, 1996), Preschool Behavior Questionnaire (PBQ; Behar & Stringfield, 1974), Classroom Adjustment Scale (CAS; Shields et al., 2001)

Table 2: Evidence Table.

General Emotion Regulation and Social Participation

Three level 2B studies [24,25,29] and four level 3B studies [26,27,30,34] used emotion regulation as a variable relating to social participation. These studies examined the participants' overall emotion regulation scores, while other studies separated subcomponents of emotion regulation to study its relationship with social participation. All studies found a relationship between emotion regulation constructs and participation socially for children. Spritz et al. (2010) [26] studied the relationship between emotion regulation and social outcomes among preschool Head Start students aged 3.5 to 5.5 years and found that emotion regulation scores on the ERC correlated with student-teacher closeness on the Student-Teacher Relationship Scale (STRS).

Emotion regulation was also a predictor of social participation in the classroom, including initiating interactions, following instructions, and exhibiting positive conflict resolution with peers. A study of Head Start students, ages 3.4 to 5.2 years old, demonstrated that teacher observed dysregulation correlated with greater peer conflict and antagonism and less cooperation in the classroom [30]. Dysregulation was defined as either emotionally negative behavior or hyperactive behavior. The children who exhibited higher levels of dysregulation also expressed more anger and negative affect than the children with low levels of dysregulation. The study found that displays of dysregulation in the classroom were brief, overall, but the individual differences correlated with significantly different social participation outcomes. In a similar age group [25], found that positive emotionality was a significant predictor of social competence. Positive emotionality was described as an aspect of emotion-related self-regulation. The term, positive emotionality, was used to describe the ability to maintain positive feelings when faced with challenging academic and social situations. The study concluded that positive emotionality was related to social participation outcomes in preschool children both in the classroom and at home. In a longitudinal study that tested children at age five, seven and ten, emotion regulation scores on the ERC were predictive of social outcomes (Blair et al., 2015) [29]. The social outcomes were peer acceptance and friendship quality. Peer acceptance, specifically within the school setting, was measured by rankings made by classmates and friendship quality was measured using a self-report questionnaire. Through these assessments, the study examined both self-perceived and peer-perceived social participation, which were both predicted by emotion regulation.

Berkovits et al. (2016) [27], found that a mother's report of emotion regulation on the ERC in four to seven-year-olds was predictive of fewer externalizing and internalizing behaviors, and greater social skills one year later. Change in social skills, measured by the Social Skills Improvement System (SSIS), indicated that emotion regulation had a positive impact on the chances for a child to succeed in social participation attempts. The study also found that emotion dysregulation longitudinally related to a decline in social skills. This study included children with ASD as they aged from age four to seven. In another study, seven to nine year-old typically developing children were compared to children with developmental delays using mother and teacher reports to study the relationship between social competence and emotional dysregulation (Berkovits & Baker, 2014) [28]. The study assessed how deficits in emotion regulation were related to social development and whether there was a differential relationship between the two developmental groups. Mother-reported measures showed a significant correlation between emotion dysregulation and social problems in both control groups. However, within teacher-reported measures, there was a significant correlation between emotion dysregulation and social problems only within the developmentally delayed group. In the typically developing group, emotion dysregulation was a predictor of change in social problems from age seven to eight and eight to nine. Through parent and teacher reports using the Behavioral Assessment System for Children (BASC), McKown et al. (2009) [34] measured self-regulation, revealing it to be associated with social competence in children aged five to 17 years. Social competence indicators included polite manners, eye contact, empathy and other desirable social behaviors as described by the BASC. Children in the study were selected through a clinic where parental concerns about behavioral, social, academic and emotional functioning were addressed. Most of the children had diagnoses of ASD, ADHD, learning disorders and/or anxiety and mood disorders.

Specific Emotion Regulation Strategies and Social Participation

Use of specific emotion regulation strategies was examined in four level 3B studies [22-24,33]. Goldsmith and Kelley (2018) [33], in their study of male participants, ages five to 14 years with a diagnosis of ASD, found that greater use of reappraisal as an emotion regulation strategy predicted lower scores on the social skills subscale of the Autism Quotient (AQ), indicating less social impairment. Reappraisal was defined as modification of one's cognitive and emotional experience to an event/situation. The social skills subscale of the AQ specifically measures the person's ability to form and maintain friendships, their desire for social interaction and their enjoyment of social occasions. Suppression,

or masking and concealing an emotional experience, which are other emotion regulation strategies, did not significantly predict social functioning.

In another study, the use of less active distraction during a frustrating task predicted greater peer rejection in later middle school years [22]. The study included only male participants from families of low socioeconomic status, ages 8.2-10.7 years old. Active distraction was defined as the ability to shift one's attention away from a frustrating object or task. Furthermore, higher rates of peer rejection experienced in middle childhood related to more antisocial behavior in early adolescence, so specific strategy use was indirectly related to adolescent social behaviors. Ogelman and Fetihi (2019) [23] examined the relationship between emotion regulation strategies and peer relationships in 95 typically developing five-year-old children. The findings indicated a predictive relationship between emotion regulation strategies and social preference scores and the ability to cope with peer pressure.

They also found a significant negative relationship between emotion regulation strategies and aggressiveness scores. Subsequently the authors concluded that effective emotion regulation strategies may enable more positive social participation and less aggression/peer pressure during social participation. The measure used to score a child's emotion regulation strategies examined both their ability to recognize strategies and the ability to generate effective strategies. High levels of active strategies and lower levels of passive strategies for emotion re-evaluation in five year-olds predicted greater social competence two years later when interacting with an unfamiliar peer [24]. Active strategies were those seeking to change the environment to reduce distress, such as seeking social support or problem solving. Passive strategies were those that disengaged one from their environment to cope with distress, such as self- soothing techniques or passive tolerance. The ability to actively engage with one's environment to reduce negative consequences was associated with higher levels of social competence in novel situations later in life.

Temperament and Social Participation

A relationship between temperament and social participation was found in one level 2B study [25] and one level 3B study [35]. Positive emotionality was found to be a significant predictor of social competence in a study of typically developing preschool students ages three to five years old [25]. It was described as an aspect of emotion-related self-regulation. The term, positive emotionality, was used to describe the ability to maintain positive feelings when faced with challenging academic and social situations. The study concluded that positive emotionality was related to social participation outcomes in preschool children both in the classroom and at home. Séguin and MacDonald (2018) [35] described temperament to be an influential factor related to a child's overall emotion regulation in first grade. The study assessed the relationships between temperament, emotion regulation, and peer relations. Temperament soothability and shyness were found to predict peer relations whereas emotion regulation did not predict peer relations.

Self- Awareness and Social Participation

One level 3B study found self-awareness, a component of emotion regulation, to be correlated to social impairment [31]. The findings were based on adolescent participants with ADHD, aged 12 to 16 years old. Greater self- awareness related to less social impairment during social participation. Similarly in another level 2B study of adolescents aged 15 to 21 years, higher emotional awareness was associated with an assimilated type of social participation, while lower emotional awareness was associated with segregated and marginalized social participation types [32].

Emotional Control/Lability and Social Participation

In their level 3B study, [31] determined the emotional regulation subscale of emotional control, in addition to self-awareness, is associated with parent and teacher reports of social impairments. This study indicates a lack of emotional control relates to greater impairment in social participation in adolescents aged 12 to 16 with ADHD. A lack of emotional control was defined as having a low threshold to reach emotional excitability followed by a slow return to baseline. Measures were based on a checklist of observed behaviors. A level 3B study involving Head Start preschool students, aged 3.5 to 5.5 years old, analyzed the relationship between emotion regulation and social participation [26]. The authors found a correlation between preschoolers' emotional lability, measured by the Emotional Regulation Checklist (ERC), and teacher ratings of the student's social skills. Specifically, greater emotional lability was associated with lower peer-rated likability and greater teacher-student conflict.

Risk of Bias

All of the reviewed articles presented a high risk of selection bias because of non-random selection of participants [22,24-29,30,32-35]. One study had a high risk for performance bias because participants were not blinded and were aware of their group allocations [28]. No studies had a high risk of detection bias since none of the studies required detection of outcomes after an intervention was administered. In most cases, it would not be reasonable to have the subjects/assessors blinded because the subjects were grouped by the presence of a condition. Two articles had a high risk of attrition bias due to missing data from participants who either dropped out or provided incomplete data [24,29]. A high risk of reporting bias was noted in thirteen articles due to the use of questionnaires or parent/teacher report [22,23,25-35]. Table 3 summarizes the risks of bias.

Reference	Selection Bias	Performance Bias	Detection Bias	Attrition Bias	Reporting Bias
Berkovits, & Baker (2014) [28]	-	+	+	+	-
Berkovits, Eisenhower & Blacher (2016) [27]	-	+	+	+	?
Blair, Perry, Obrien, Calkins, Keane, & Shanahan (2015) [29]	-	+	+	+	-
Bunford, Evans, Langberg, (2018) [31]	+	+	+	+	-
Goertz-Dorten, Benesch, Berk-Pawlitzek, Faber, Hautmann, Hellmich,., . . . Doepfner (2018)	-	-	+	+	+
Goldsmith & Kelley (2018) [33]	-	+	+	+	+
Jankowski, Paweł & Rękosiewicz, Małgorzata. (2013) [32]	-	-	+	+	-
McKown, Gumbiner, Russo & Lipton (2009) [34]	-	-	-	+	-
Miller, Gouley, Seifer, Dickstein & Shields (2010) [30]	-	+	-	+	-
Penela, Walker, Degnan, Fox& Henderson, (2015) [24]	+	-	-	+	+
Salavera, Usán, & Jarie, (2017) [17]	-	-	+	+	-
Séguin & MacDonald (2016) [35]	+	-	-	-	+
Siregar, Rachmadtullah & Pohan, (2018) [36]	-	-	+	+	-
Spritz, Sandberg, Maher& Zajdel (2010) [26]	-	+	-	-	?
Trentacosta & Shaw (2009) [22]	-	-	-	+	-
Note: - = high risk of bias; + = low risk of bias; ? = unclear risk of bias					

Table 3: Risk of Bias Table.

Discussion

Among 13 of the 14 studies in this review, emotion regulation and social participation variables were found to be significantly related, which generated a moderate strength of evidence. The study that did not support this relationship separated temperament from emotion regulation variables, rather than identifying temperament as a component of emotion regulation [35]. The results indicated that soothability and shyness were the predominant predictors of peer relationships. Of note, soothability included in its construct the behaviors of calming down quickly, being soothed by caregivers, and tolerating frustration well [37], which are outcomes of emotion regulation processes that include modification of the situation and modulation of responses [38]. Another reviewed study also found a relationship between emotionality and social outcomes but included emotionality as a component of emotion regulation [25]. So, although Séguin and MacDonald (2016) [35] did not find a relationship between their emotion regulation constructs and social participation, they did find a relationship between soothability and social participation, which has components of the emotion regulation process inherent in the

construct. This suggests that the study actually supports aspects of emotion regulation as being predictors of social outcomes.

Ten of the studies found relationships between emotion regulation skills in childhood and later social competence [22-25,27-29,33,35]. This suggests that emotion regulation skills may be necessary for success in social participation. Understanding how emotion regulation and social skills are related can help guide treatment plans by encouraging practitioners to adopt a holistic view when habilitating emotional dysregulation and poor social participation. Practitioners can utilize these findings by incorporating emotion regulation interventions into social skills training or prior to social skills training in order to maximize improvements in social participation among children and adolescents. Specific components of emotion regulation that were found to predominantly relate to social participation were use of emotion regulation strategies, temperament, emotionality, self- awareness, emotional control, emotional lability, and observed emotion regulation. Although the studies used a variety of constructs and assessments to measure and define emotion regulation, all used constructs that fit the above common themes.

General Emotion Regulation Strategies

With two level 2B and four level 3B studies, the theme of general emotion regulation strategies had the strongest evidence supporting its relationship with social participation [26-30,34].

The studies examining this theme suggest that parents and teachers who spend a significant amount of time with the children have valuable insight into the child or adolescent's behaviors and can identify behaviors that most significantly impact the child or adolescent's social participation. Practitioners can use this knowledge by targeting specific dysregulated behaviors of concern as reported by teachers and/or parents in order to impact the child's social participation.

Self-Awareness

Self- awareness was the next strongest theme because it was supported by one level 2B [32] and one level 3B [31] study, with a collective total of 1,331 participants. The studies included participants, aged 12 to 21 years, suggesting that self-awareness is related most to the social participation of adolescents; Sebastian, Burnett and Blakemore (2008) described how neuroanatomical changes during adolescence contribute to the development of self-awareness. The development of the prefrontal cortex in adolescence supports that self-awareness requires a higher level of executive functioning specific to older children. Practitioners may implement self-awareness interventions for adolescents with social impairments to improve their social participation.

Temperament

Temperament was supported by a level 2B [25] and a level 3B [35] study, with a total of 105 participants between the two studies. Emotionality, as a factor of temperament, was found to be specifically applicable in preschool to first grade. Because this theme was generalizable only to younger children, it is possible that it is a more foundational component of emotion regulation that is the basis of other emotion regulation skills, such as self-awareness and the use of specific strategies. Temperament was found to be a strong predictor in aspects of social functioning including relationships with others and managing positive behaviours. Practitioners can utilize interventions that promote positive emotionality, equated to temperament in several articles, and soothability during challenging situations, particularly for the age range of preschool to first grade, in order to improve the child's social competence [35].

Specific Emotion Regulation Strategies

The use of specific emotion regulation strategies was related to social participation in four level 3B studies, making it the fourth strongest theme [23,24,33]. The specific strategies having a positive impact on social participation were reappraisal and active distraction/active strategies. Alternatively, passive strategies, where the child disengages from the environment, such as self- soothing behaviors and passive tolerance, were found to relate negatively to social participation [24]. Suppression did not predict social functioning outcomes. These findings suggest that practitioners should focus on teaching their pediatric clients to reappraise situations assessed as negative and to actively engage in the environment in order to regulate their emotions. One of the studies examining this theme also found that at age five, peer relationships were related to the child's ability to recognize emotional regulation strategies. Therefore, practitioners can use strategies to practice recognizing and identifying emotional regulation strategies with younger children, while teaching them to generate adaptive emotional regulation strategies themselves. According to the studies examining emotional regulation strategies, it is generalizable for ages four to ten.

Emotional Control and Emotional Lability

Helping the child develop emotional control may also have an impact on social participation. This theme included studies with participants from the age of 12 years and older, so evidence suggests its appropriateness for adolescents, similar to the skill of self-awareness. This may indicate that emotional control and self-awareness are more developmentally advanced skills than those that were generalizable only to young children, such as emotionality and emotional lability because of the requirement for

requisite skills such as cognitive flexibility, which is dependent on frontal lobe development [39]. This theme has a lower strength of evidence to support it, with one level 3B study [31] with 180 participants. A child's ability to reduce emotional lability may also have a positive impact on social participation, particularly within the preschool population. Emotional lability was the least supported theme, with one supporting level 3B article including 44 participants [26]. The study definition of emotional lability was involuntary manifestations of emotional arousal, which were measurable through mood swings, angry reactivity, and emotional intensity.

The authors discussed how children's control over their emotional lability was a key factor in determining likability by peers and future conflict between the student and the teacher. For a child to be successful during social participation among peers, it is important for them to develop control over their emotional lability through emotional regulation.

Strengths and Limitations

A strength of the articles reviewed was that data were obtained through a variety of assessment tools, such as: interviews of peers, teachers or parents, questionnaires, standardized assessments, self-report, and observations, providing a range of perspectives to support the validity of the findings. The studies included in the review also covered a wide age range from early childhood through late adolescence. In addition, consistent results were found in the articles reviewed with 13 out of the 14 indicating a relationship between social participation and emotional regulation. A limitation of this study was the lack of consensus on emotional regulation components. The theme of emotional lability was not a strong theme, with only one study with 44 participants. However, with a more consistent definition of emotional regulation, the themes might have been better supported and streamlined.

Recommendations for Future Research

This review examined emotion regulation as a construct combining managing and modifying one's internal state and/or outward behavior in different situations [1]. Several theorists have separated the constructs of emotional, cognitive and behavioral self-regulation [40-42]. Further research is needed to contribute to the strength of clinical evidence regarding these developing constructs describing aspects of self-regulation. Randomized control trials are needed to examine the importance of interventions addressing these factors for increasing social participation. Further studies are needed to examine and differentiate these factors in children and adolescents with specific conditions who may be prone to emotional dysregulation or lack of social participation such as ASD, ADHD, learning disorders and/or anxiety and mood disorders. Longitudinal research would provide more information about associations and predictive patterns between emotional regulation and social competence at different points of development in response to a combined emotional regulation training and social skills training program.

Conclusions

Emotion regulation was found to have a significant relationship with social participation among children and adolescents who were typically developing or who had diagnoses of ASD, ADHD, learning disorders and/or anxiety and mood disorders. General emotion regulation strategies, self-awareness, temperament, emotional control, and use of specific regulation strategies were the studied themes that demonstrated relationships with social participation in recent literature. In practice, clinicians/practitioners and educators can utilize these components of emotion regulation to focus remediation strategies to support social participation and facilitate social skill development in children and adolescents. To address their clients' social participation, it is important for practitioners to facilitate development of emotion regulation skills. These skills are significant predictors of mental health and school functioning [18] and ultimately the ability to flourish in life [5]. Practitioners can provide strategies to cultivate positive emotional regulation responses or prevent dysregulation. Emotion regulation education in conjunction with social skills training for children and adolescents provides a more holistic strategy to address social participation challenges.

References

1. Compas BE, Jaser SS, Dunbar JP, Watson KH, Bettis AH, et al. (2014) Coping and emotion regulation from childhood to early adulthood: Points of convergence and divergence. Aust J Psychol 6: 71-81.
2. Tull MT, Aldoa A (2015) New directions in the science of emotion regulation Current Opinion in Psychology 1: iv-x.
3. Heatherton TF (2011) Neuroscience of self and self-regulation. Annual Review of Psychology 62: 363-390.
4. Malti T, Noam GG (2016) Social-emotional development: From theory to practice. European Journal of Developmental Psychology 13: 652-665.
5. Hilton C, Ratcliff K, Collins D, Flanagan J, Hong I (2019) Flourishing in Children with Autism Spectrum Disorders. Autism Research 12: 952-966.
6. Röll J, Koglin U, Petermann F (2012) Emotion regulation and childhood aggression:Longitudinal associations. Child Psychiatry and Human Development 43: 909-923.
7. García-Sancho E, Salguero JM, Fernández-Berrocal P (2014) Relationship between emotional intelligence and aggression: A systematic review. Aggression and Violent Behavior 19: 584-591.
8. Humphrey N, Kalambouka A, Wigelsworth M, Lendrum A, Deighton J, et al. (2011) Measures of social and emotional skills for children and young people: A systematic review. Educational and Psychological Measurement 71: 617-637.
9. Leehr EJ, Krohmer K, Schag K, Dresler T, Zipfel S, et al. (2015) Emotion regulation model in binge eating disorder and obesity: A systematic review. Neuroscience and Biobehavioral Reviews 49: 125-134.

10. Malik S, Wells A, Wittkowski A (2015) Emotion regulation as a mediator in the relationship between attachment and depressive symptomatology: A systematic review. Journal of Affective Disorder 172: 428-444.

11. Weiss JA, Thomson K, Chan L (2014) Emotion regulation measurement in individuals with ASD. Autism Research 7: 629-648.

12. Cole PM, Michel MK, Teti LO (1994) The development of emotion regulation and dysregulation: A clinical perspective. Monographs of the Society for Research in Child Development 59: 73-100.

13. Silk JS, Steinberg L, Morris AS (2003) Adolescents' emotion regulation in daily life: Links to depressive symptoms and problem behavior. Child Development 74: 1869-1880.

14. Holtmann M, Buchmann AF, Esser G, Schmidt MH, Banaschewski T, et al. (2011) The child behavior checklist□dysregulation profile predicts substance use, suicidality, and functional impairment: A longitudinal analysis. Journal of Child Psychology and Psychiatry 52: 139-147.

15. Salavera C, Usán P, Jarie L (2017) Emotional intelligence and social skills on self-efficacy in secondary education students. Are there gender differences? Journal of Adolescence 60: 39-46.

16. Blair C (2002) School readiness: Integrating cognition and emotion in a neurobiological conceptualization of children's functioning at school entry. American Psychologist 57: 111-127.

17. Raver C (2002) Emotions matter: Making the case for the role of young children's emotional development for early school readiness. Social Policy Report 16: 3-18.

18. Rydell AM, Thorell LB, Bohlin G (2007) Emotion regulation in relation to social functioning: an investigation of child self- reports. European Journal of. Developmental Psychology 4: 293-313.

19. Keane SP, Calkins SD (2004) Predicting kindergarten peer social status from toddler and preschool problem behavior. Journal of Abnormal Child Psychology 32: 409-423.

20. Ladd G, Burgess K (2001) Do relational risk and protective factors moderate the links between childhood aggression and early psychological and school adjustment? Child Development 72: 1579-1601.

21. American Occupational Therapy Association (AOTA). (2020). Guidelines for systematic reviews.

22. Trentacosta CJ, Shaw DS (2009) Emotional regulation, peer rejection, and antisocial behavior: Developmental associations from early childhood to early adolescence. Journal of Applied Developmental Psychology 30: 356-365.

23. Ogelman HG, Fetihi L (2019) Examination of the relationship between emotional regulation strategies of 5-year-old children and their peer relationships. Early Child Development and Care 1-9.

24. Penela EC, Walker OL, Degnan KA, Fox NA, Henderson HA (2015) Early behavioral inhibition and emotion regulation: Pathways toward social competence in middle childhood. Child Development 86: 1227-1240.

25. Garner PW, Waajid B (2012) Emotion knowledge and self- regulation as predictors of preschoolers' cognitive ability, classroom behavior, and social competence. Journal of Psychoeducational Assessment 30: 330-343.

26. Spritz BL, Sandberg EH, Maher E, Zajdel RT (2010) Models of emotion skills andsocial competence in the head start classroom. Early Education and Development 21: 495-516.

27. Berkovits L, Eisenhower A, Blacher J (2016) Emotion regulation in young children with autism spectrum disorders. Journal of Autism and Developmental Disorders 47: 68-79.

28. Berkovits LD, Baker BL (2014) Emotion dysregulation and social competence: Stability, change and predictive power. Journal of Intellectual Disability Research 58: 765-776.

29. Blair BL, Perry NB, Obrien M, Calkins SD, Keane SP, et al. (2015) Identifying developmental cascades among differentiated dimensions of social competence and emotion regulation. Developmental Psychology 51: 1062-1073.

30. Miller AL, Gouley KK, Seifer R, Dickstein S, Shields A (2010) Emotions and behaviors in the head start classroom: Associations among observed dysregulation, social competence, and preschool adjustment. Early Education and Development 15: 147-166.

31. Bunford N, Evans SW, Langberg JM (2018) Emotion dysregulation is associated with social impairment among young adolescents with ADHD. Journal of Attention Disorders 22: 66-82.

32. Jankowski P, Rękosiewicz M (2013) Type of social participation and emotional regulation among upper secondary school students. Polish Psychological Bulletin 44: 322-330.

33. Goldsmith SF, Kelley E (2018) Associations between emotion regulation and social impairment in children and adolescents with autism spectrum disorder. Journal of Autism and Developmental Disorders 48: 2164-2173.

34. McKown C, Gumbiner LM, Russo NM, Lipton M (2009) Social-emotional learning skill, self-regulation, and social competence in typically developing and clinic-referred children. Journal of Clinical Child and Adolescent Psychology 38: 858-871.

35. Séguin DG, MacDonald B (2016) The role of emotion regulation and temperament in the prediction of the quality of social relationships in early childhood. Early Child Development and Care 188: 1147-1163.

36. Siregar Y, Zulela M, Prayuningtyas A, Rachmadtullah R (2018) Self regulation, Emotional Intelligence With Character Building In Elementary School.

37. Rowe DC, Plomin R (1977) Temperament in early childhood. Journal of Personality Assessment 41: 150-156.

38. Gross JJ (1998) The emerging field of emotion regulation: An integrative review. Sage Journals 2: 271-299.

39. Koch SBJ, Mars RB, Toni I, Roelofs K (2018) Emotional control, reappraised. Neuroscience and Biobehavioral Reviews 95: 528-534.

40. Edossa AK, Schroeders U, Weinert S, Artelt C (2018) The development of emotional and behavioral self-regulation and their effects on academic achievement in childhood. International Journal of Behavioral Development 42: 192-202.

41. Gioia GA, Isquith PK, Guy SC, Kenworthy L (2000) Behavior rating inventory of executive function. Odessa, FL: Psychological Assessment Resources.

42. Muñoz MP, Filippetti VA (2019) Confirmatory Factor Analysis of the BRIEF-2 Parent and Teacher Form: Relationship to Performance-Based Measures of Executive Functions and Academic Achievement, Applied Neuropsychology: Child.