REVIEW ARTICLE

https://doi.org/10.1057/s41599-019-0259-0

OPEN

Reflecting on childhood and child agency in history

Ute Haring¹, Reesa Sorin¹ & Nerina J. Caltabiano²

ABSTRACT

In today's fast changing and unpredictable world we tend to rely upon children's agency to ensure their survival following traumatic events. Because of this, parents and teachers need to be conversant with ways of encouraging children's agency to support their health and efficacy throughout the lifespan. This paper takes the form of a literature review covering historical and recent developments in the field of childhood, child abuse and child agency. It offers the findings of a qualitative document study that aimed to explore how childhood and child agency have been conceptualized historically in the Western world. It begins with a summary of theories and typologies of childhood throughout history, exploring the unique social and historical concepts in which theories of childhood and child agency developed. Furthermore, a paradigm shift in Western society towards women achieving agency is revealed. With this came greater attention to the child, especially the abused child. Focusing on abuse to which children have been exposed, this study looks at child agency and how it can be actualized for children's wellbeing. Research findings make a strong case for the arts to provide valuable tools of resilience for the developing child. Arts-based activities have been increasingly appreciated as providing a voice for traumatized or abused children. Therefore, the findings of this study into agency and child abuse were distilled into a poem to demonstrate the potential impact on a child and to help adults better understand the historically perceived voiceless victim. The poem, as seen from the perspective of the child, offers a distinctive contribution to the literature on child abuse. Key findings of this study are discussed, including the importance of increasing understanding of children's agency. It is argued that a shift in childrearing, incorporated child protection laws and agentic experiences build children's confidence to challenge the traditional adult-child power relationship. The results of this research help to contribute to teacher knowledge about the intricate background to child abuse and child agency.

¹ College of Arts, Society, and Education, James Cook University, Cairns, QLD 4814, Australia. ² College of Healthcare Sciences, James Cook University, Cairns, QLD 4814, Australia. Correspondence and requests for materials should be addressed to N.J.C. (email: Nerina.Caltabiano@jcu.edu.au)

Introduction

"Seldom do written documents look toward children for [the] insights and answers" (St. Thomas and Johnson, 2007, p. 11)

e live in uncertain times. There are daily reports about human-made disasters like terrorism, wars, ethnic conflicts, forced relocation, and global natural disasters like earthquakes, cyclones, floods, mudslides and wild fires (Silverman and La Greca, 2002). "Disasters are more common and destructive than most people realize" (Shen and Sink, 2002, p. 322). St. Thomas and Johnson (2007) state that due to "the immediacy of news events from around the world, fear of death and loss has become the norm" (p. 11). Children are viewing these events day-to-day and might be more deeply affected than adults (Seideman et al., 1998). Correspondingly UNICEF (2017) has reported that worldwide around 535 million children live in terrifying conditions, exposed to violence, disease and hunger, being in a "constant state of fear" (St. Thomas and Johnson, 2007, p. 12). These experiences traumatize children (Danese and Baldwin, 2017; Dunn-Snow and D'Amelio, 2000), affecting them throughout their lifetime (Haring, Sorin and Caltabiano, 2018). Children are also the most vulnerable in any disaster, generally depending totally on adults, emotionally and materially (Balaban, 2006), therefore children's personal disasters like parent divorce or abuse are the most damaging to a child's psyche "since the abuse is a profound violation of a protective trust" (Sosteric, 2013, p. 3/4).

Traditionally, children had no voice and were not listened to; indeed they were silenced (Powell, Smith and Taylor, 2016). In recent years educational (National Quality Standard Professional Learning Program, 2013) and legal institutions (Macdonald, 2017), charity organizations (PLAN, 2017) and medical institutions (Dedding et al., 2014), as well as UNICEF (n. d.) have called for greater autonomy of children to survive in these challenging times.

Primarily, the Universal Declaration of Human Rights (1948) set the path for the discussion of agency for women and children. Over time, childrearing practices have changed from abuse of children and accepted infanticide to the theory of sensitive adult-child power sharing (Powell et al., 2016). 'Agency' has been defined by Bandura (2017) as "to intentionally produce certain effects by one's actions" (p. 130). Kumpulainen et al. (2014) explain further that agency is traditionally and culturally defined: it is a continuous process which can be "occasional, multifaceted, relational and transitory", can "manifest itself in various actions" and will "vary across space and time" (p. 213). Lancy (2012) warns that agency in children has to be further researched, carefully observed and monitored to avoid the "agentic child" turning into the "snowballing" or "out of control" child (Sorin and Galloway, 2006, p. 21), reversing what had been attempted.

Changing theories of childhood point to a shift in the relationship of adults to children (Dekker et al., 2012). Teachers too will have to acknowledge the agency of children, viewing them as "being extremely creative, possessing a great deal of insight and knowing" (St. Thomas and Johnson, 2007, p. 10). According to Sorin (2005) children undoubtedly need to be protected from harm in personal disasters like abuse. Due to their duty of care, teachers, staff and parents must know how to detect child abuse and how to listen to the child, protect and encourage agency (Walsh et al., 2011). It might be necessary for parents, teachers and child protection officers to become aware of the theories of childhood, childrearing and the typography of children throughout history, to be able to reflect on their own teaching or child rearing practices. Correspondingly, teachers and parents have to become mindful that 'art, play and imagination' are necessary for the cognitive development of children (Malchiodi, 1998). Equally, research findings make a convincing case for the Arts to provide valuable tools of learning for the developing child. Therefore educators have attempted to address education through Arts-based interventions.

Arts-based methods allow teachers to try new ways to enthusiastically involve their students. Ashton-Hay (2005) considers poetry, and drama in particular, to be valuable teaching tools (p. 1). Arts-based interventions (either in the classroom or in therapeutic sessions) have been found to have healing power, providing a window into the innermost psyche of a child, helping to recover the enjoyment of life, making sense of their world and 'the mystery of existence' (Allen, 1995; Binder, 2011; Binder and Kotsopoulos, 2011; Bone, 2008; Golomb, 2004; Haring, 2012; Malchiodi, 1998; McNiff, 1998; Rubin, 1984). Creating art, especially drawing their 'unspeakable experiences', encourages children's resilience and confidence. They can learn to speak up and not to remain helpless and voiceless victims (Haring and Sorin, 2016), as the child had been historically perceived.

In attempting to fill a gap in the literature on childhood, and specifically child abuse, this study has taken an unconventional approach by reviewing research into childhood as viewed in the history of Western culture, and then creating a poem to alert educators to the predicament of the abused child. To add substance to this, the next section then examines how children were perceived historically in the Western world.

Childhood in history

"The history of childhood is a nightmare from which we have only recently begun to awaken" (deMause et al., 2005, p. 204).

The concept of childhood is an ever changing and complex one with varied interpretations. Viewed traditionally in connection with childrearing practices, 'childhood' is an adult social and cultural construction, developed in the Western world; or as Zhao (2011) states: "It is a reflection of the specific social, political, and cultural purposes of the unique time and space", in which children happen to grow to adulthood (p. 241). Social groups show different trends culturally due to variations in attitudes and beliefs which vary over time as behavior of people depends on vibrant interaction in daily life. These interactions can only be understood in terms of the "Zeitgeist" [Messinger (1988, p. 611) defines this as "Spirit of the Age"], in which these events happen (Chaffin, 2006).

Concerning childhood, Chaffin (2006) states that "Throughout history children have been raised, in ways ranging from nurturing to indifferent to savage" (p. 663). Infanticide for example, was practised in all cultures, depending on the tolerating attitude of a society (deMause, 1994; Tomison, 2001). Langer explains that for millions of years infanticide "has been an accepted procedure for disposing not only of deformed or sickly infants, but of all such newborns as might strain the resources of the individual family or the larger community" (as cited in Eisenberg, 1981, p. 300). Tort reports that "10-15% of all children ever been born have been killed by their parents: an astounding seven billion victims" (Milner as cited in Tort, 2008, p. 187). Yet, cultures which practiced infanticide could be otherwise highly supportive of children in care and warmth of upbringing (Milner as cited in Tort, 2008).

Psychogenic mode	Time in history	Description
1. Infanticidal	Pre-history to 4th Century C. E	An extremely high rate of child abuse and infanticide. Emotional abandonment by parents. Child sacrifice happened. Adults controlled the child. Children worked to support the family
2. Abandoning	4th Century to 13th Century	Characterized by the Christian ideal of Christ sacrificed, instead of child sacrificed; physical and sexual abuse of children continued; children revered people of authority so not to be totally abandoned (to monasteries, service to kings and nobilities)
3. Ambivalent	13th century to 17th century	Slowly laws were developed to protect children; schools were established. However the child is still seen as bad because of Eve's sin and their parents' intimacy. Shaming and blaming were tools to discipline the child. Love-hate relationships between parents and child developed in this period
4. Intrusive	18th century	Parents gave more love and care to their children, however severe punishment was handed out for bad behavior
5. Socialization	19th century -mid-20th century	Parents offered more respect to their children's wishes, even though beating and shaming discipline methods continued to socialize children
6. Helping	Mid-20th century to present	Parents began to help their children to achieve their own goals while growing into adult life
7. Emotional literate	Beginning early twenty-first century	Introduced by Simmons (2014). He suggests that in the modern era parents raise children who are aware of their own emotional reactions, becoming responsible for their own life and also for the society in which they live (p. 47)

Table 1 Table presents an interpretation of Child-rearing throughout history based on the previously mentioned sources

Researchers into the history of childhood and education have attempted to categorize the information found according to their discipline area. Smith (2011), a researcher in Sociology, explains that for centuries governments favored the Dionysian model to effectively govern society, defining the child as evil (Zhao, 2011, p. 248); or as Smith (2011) states, imbued with 'original sin', to produce submissive and productive individuals. The later Apollonian approach viewed the child as innocent or "intrinsically good" (Jenks, 2005, pp. 64–65). Smith (2011) added a third, democratic approach to the image of childhood: the Athenian child, to give children growing up in modern times a "voice and choice" (p. 31).

deMause, an investigator in psychohistories, has extensively researched traditions of childrearing in different times and cultures (Juan and Stevens, 2009), theorizing that certain epochs in history show general characteristics in the development of a society. He views childhood through the lens of the "evolution of childrearing" (Juan and Stevens, 2009), reflecting about the way children were treated in history. deMause surmised that due to changes in childrearing practices from an insensitive attitude to children to an ethical consideration of valuing human life, society slowly changed over the centuries. He discerns between six psychogenic modes of which the first one describes childrearing in pre-history (Juan and Stevens, 2009). deMause states that these six modes have never been definite but rather have overlapped, regressed or been advanced, depending on the society which accepted changes in the ideology of how children were treated. The overall rather negative view of humanity's development has been positively advanced by Simmons (2014), who has added a 7th mode to deMause's six modes (Table 1).

Typology of children

Sorin and Galloway (2006) explored childhood from various angles in a more detailed way. They developed a construct of ten different concepts of how children have been defined throughout history up to modern times; how they have been viewed or "used for different social, cultural, economic, and political purposes" (Zhao, 2011, p. 242). According to 'postmodern, constructivist theory' relationships of adult to child are at the core of all childhood constructions (Sorin and Galloway, 2006). It is assumed, that when educating children, "multiple definitional perspectives" are involved. The following typology of children is an attempt to classify the contested definitions of childhood in history (Ibid, p. 13). (See Table 2).

It became obvious from this research that, unlike the deMause perspective, Sorin and Galloway (2006) present a more balanced view of the child in history. It must be acknowledged, however, that the historical resources deMause accessed, supported his negative outlook which is at odds with the current view of children and childrearing practices. Women's rights in the Western world have been instrumental in providing recognition for the role that women contribute to family, childrearing and society (Rubio-Marin, 2014). As mentioned previously the role of women had been defined historically as the oppressed or "forgotten women" (due to gender and marriage), but the advancement of suffragettes and feminism (Haug, 2007, p. 34) changed society's perception. According to Coady (2017) education of the young was most important to feminists, as well as "a change to women's social condition" (p. 16). This in turn affected society's view of children and children's rights, enabling a trend towards children's agency. However, there may be times and places where children's agency has been thwarted. One such example is child abuse. A perspective on child abuse is presented next.

Child abuse

"In the attic of his childhood was an old trunk, and even though he couldn't pry it open, the muffled sobs coming from inside told him more than he wanted to remember" (-E9art (n. d.))

As the notion of child abuse varied in times, cultures and places, as well as in social and political ideologies, religions and systems (Tilbury et al., 2007), it became necessary in the Western world for child abuse to be defined. Women and children historically had been powerless within society and marriage due to financial dependency and society's norms. This led inevitably to maltreatment and abuse (Ibid). However, a description could only be established by "societies that [were] willing to sanction societal intrusion into childrearing" (Chaffin, 2006, p. 663). This happened only in the latter half of the 20th century but enabled professionals to intervene, to develop and implement laws to protect and ensure a safe future for children (Tomison, 2001).

As Briggs (2012) explains, Australian legislation slowly developed into a "complex system" (p. 26). She gave the example of the Criminal Law Act of 1845 which made sexual intercourse with an under-10-year-old girl a criminal offense. The age limit of girls was then elevated to 12-years in 1876, and in 1975 to18 years of age (Briggs, 2012). Briggs found that these laws only protected

Concept	Description
The innocent child The child is born pure and innocent (Froebel)	This concept denies the child agency but asks for the care and protection of adults
The evil child The child seen as evil due to original sin (Sorin and Galloway, 2006, p. 14/15)	This construct permitted infanticide and physical abuse: deMause (1994) reports that i was thought severe beatings would put a child on the right path to maturity and would lead to a responsible attitude to life and society
The snowballing child	Here the child takes power from the adult in an uneven relationship where tired parents give in again and again to the demands of the child
The out-of-control child	These children have lost control over themselves (e.g., anorexia nervosa), the adult feels powerless to express agency
The noble/savior child	Similar to Harry Potter, who takes on responsibility to protect others. Adults might be depending on this child because of illness or substance abuse
The miniature adult	This construct sees the child as a small adult (depicted in paintings with adult face and adult clothes but much smaller in size) with no distinction between childhood and adulthood. This concept permits society to use children as laborers, soldiers and othe adult occupations
Adult in training	The adult in training is seen in advertisements as "human becomings", not as "human beings". This view is favored by developmental psychologists like Piaget, Erikson and Freud
The commodified child	The child has no voice, is open to exploitation by adults (e.g., the four-year old beauty queen)
The child as victim	This child is living in war times and crime, is powerless and often not noticed as adults around them can only appeal to charities for help
The agentic child	These children have the support of loving adults to guide them to achieve their goals their voices are respected and considered, which empowers the child to act participatory and collaboratively with adults

girls, "there being a mistaken assumption that either boys were not vulnerable or alternatively, that an early introduction to sex was harmless" (Ibid, p. 26). "Child rescue" procedures had been voluntarily set up by missions and also by the state governments of Australia as early as the mid-1800s (Liddell as cited in Tomison, 2001) to institutionalize neglected children. The increasing population of Australia made it necessary to regulate child welfare in Victoria, which led to the establishment in 1894 of the "Victorian Society for the Prevention of Cruelty to Children" (Ibid, p. 49). Other states soon followed. This positively impacted on family support systems but regrettably led to the "Child Rescue Movement". Later this concept resulted in the removal and institutionalizing of thousands of Aboriginal children of mixed parental heritage; lasting from 1920 to 1970, [now termed the "Stolen Generation" (Liddell as cited in Tomison, p. 50)].

When a professional team in the USA in the 1960s [piloted by Kempe], published an article on the "Battered Babies Syndrome" [physical and psychological injuries inflicted on a baby...by a caretaker, Colman, 2003, p. 81] (Briggs, 2012, p. 29; Tilbury et al., p. 9), the general public and governments around the world caught up on the severity of abuse of children in families and care institutions. It seems that the "Zeitgeist" of the Industrial Revolution and of the Colonization period which had engulfed people and nations from the 1700s on, prevented them from noticing the individual suffering of women and children in their own societies. Not only had doctors in emergency rooms of hospitals not reported injuries, obviously not received due to falls out of trees or from 'bumping into things' (Legano et al. 2009; Potter, 2000) but doctors might have been hesitant to get engaged in drawing attention to the incidents due to confidentiality and the belief that parents would not harm their own children (Herman, 1995; Briggs, 2012).

After the 'medicalising' of child maltreatment by Kempe (1962), the focus of society was finally on the parents and the abused child. Unfortunately, "blame on the parents diverted

attention from family needs and potential interventions" (Parton, 1985, p. 15). It was hoped that parent education would prevent child maltreatment. Critical professionals, who realized that childhood was a special phase of the life-span, researched and then catalogued child abuse into the four categories of: physical, psychological, sexual abuse and neglect (Tilbury et al., 2007).

Physical abuse

Physical abuse is defined as generally including "non-accidental injury-often associated with inappropriate punishment administered by an angry, frustrated carer, parent or [their] partner" (Briggs, 2012, p. 153). The effect of family violence traumatizes children. Coleman (2012) defined trauma as "deep human suffering caused by overwhelming life experience that persistently interferes with one's quality of life or wellbeing" (p.7).

Emotional (psychological) abuse

The lack of a clear definition of emotional abuse has often failed children. Child protection organizations have not intervened in cases of emotional abuse because this kind of abuse is difficult to detect and may often be the underlying core problem of physical and sexual abuse or neglect. Most often the term: 'emotional abuse' has been employed by researchers. Inquiry has shown that a child, exposed to emotional abuse, is scarred for life, feeling worthless and unloved (Briggs, 2012).

Sexual abuse

Child sexual abuse has been defined by the World Health Organisation as involving a child in "sexual activity that he or she does not fully comprehend, is unable to give informed consent to, or for which the child is not developmentally prepared and cannot give consent, or that violates the laws or social taboos of society" (as cited in Legano et al., 2009, p. 274).

Neglect

It can be argued that neglect is at the core of abuse. 'Neglect' is seen as "chronic inattention given to the children by their parents or caretakers in the areas of medical, educational, stimulative, environmental, nutritional, physical or emotional needs" (Swann as cited in UKIP-Using Knowledge in Practice (2014), p. 1). Neglected children are at risk of deterioration in their developing health and emotional wellbeing (Lutzker, van Hasselt et al., 1998). In short, child abuse can take many guises. Such personal disasters can limit children's agency unless they can be assisted by caring adults. The next paragraph discusses children's feelings of helplessness in challenging times.

Children's personal disasters and children's fears

"A child's fear is a world whose dark corners are quite unknown to grownup people" (Green, J. Quotes. (n. d.))

Personal disasters like physical abuse, experiencing domestic violence or the divorce of parents can have a devastating effect on children. According to Nicastro and Velasco-Whetsell (1999) these events traumatize children deeply, even more than any major community disaster would. Personal disasters destabilize a child's normal development, produce fear and threaten a child's future survival. Although fear is a part of childhood's psychological growth, research has shown that fear is different in individual children and can negatively influence the development of positive resilience to disasters (Leppma et al., 2015). Fear has been defined as "a distressing emotion resulting from real or perceived threat" (Ibid, p. 261). Reactions of children to fear involve their "thoughts, emotions, and physical sensations" (Ibid, p. 263). These fear-induced reactions might lead to anxiety, anxiety disorders and further adult psychopathology (Ibid). Becoming aware of negative and positive emotions might then help the child to develop a sense of control over their fears and further resilience.

However, fear in children can escalate; especially in young children, who might misinterpret a situation while they are exposed to domestic violence. Kitzmann, Gaylord, Holt and Kenny (2003) report that "children in violent homes commonly see, hear, and intervene in episodes of marital violence" (p. 339). It has been reported in the media that in the USA most probably 50% of marriages will be divorced (Øverland et al., 2012). Increasingly children will witness interparental conflicts, domestic violence, divorce and resettling with mother or father. Atkinson et al., (2009) confirm that being tangled in domestic conflict "is universally threatening for children" (p. 290).

Age and gender might influence children's reactions. However, fear for personal and mother's safety is paramount. Further "fear of escalation, being drawn in, family breakdown and attachments threats" (Atkinson et al., 2009, p. 283), can all potentially produce trauma (Holt et al., 2008). Another result of domestic violence is the physical abuse a child might experience while trying to intervene to protect a mother or father (Hannan, 2012). It is estimated that 1500 children die annually in USA from physical abuse (Simon et al., 2018). Most cases of injury are not reported. Hospital data are incomplete as denial of the abuse and shame prevent the perpetrator to bring attention to the child's critical situation. Øverland, Thorson and Størksen (2012) indicate that teachers can support children, acting as catalysts to encourage resilience by listening, by developing a warm and concerned relationship, by becoming aware of potential risks for the child and by stimulating well-being. Correspondingly it has been suggested that teachers need to assume a much wider role than previously expected (Bojuwoye and Akpan, 2009) as personal disasters for children (e.g., divorce of parents) have dramatically increased in recent years (Øverland et al., 2012). In the following

poem the first author has tried to demonstrate the potential impact abuse has on a child, to help us, as adults, to better recognize the suffering of the voiceless victim.

Translating research into poetry

"Children are like sponges, they hear, see and feel everything especially when it comes to domestic violence" (Hubbard, 2010).

Knowledge gained from this review has been translated into a poem. In this shape-poem the first author tried to express how a young child reflects on the family violence he/she observed and was involved in. (shape-poem = calligram, definition: "a poem whose words form a shape...related to the poem", Moustaki, 2001, p. 316).

Can't anyone help me? He hits mum, he hits me -He hits mum, he hits He hits mum, he He hits mum He hits He He hits mum He hits mum, he He hits mum, he hits He hits mum, he hits He hits mum, he hits Me hits mum, he hits He hits mum, he hits He hits mum, he hits me I hid -And I cried – (Haring, 2014).

Deconstructing the poem

The poem has been shaped like a hand hitting the child or like a symbolic cut into the child's personality, to illustrate the child's despair and conflicting emotions. As traditionally and culturally children were not allowed to 'have a voice' (Powell et al., 2016), especially young children have been unable to talk about their feelings of isolation, shame, guilt, and confusion. Having to take abuse from a person, who ideally should love and protect, is utter defeat for the child as children have no power in a violent situation. This kind of abuse may 'kill the soul' (Miller, 1987), produce trauma and influence the development throughout the lifespan. In the poem the child is mumbling to him/herself over and over again: "I am helpless; dad hits mum; I want to protect her; he hits me too." In the child's mind there is no solution to the problem, the mind is blank. The same words would continue into an endless continuing verse because the child feels that there is no one to listen or help Therefore the child hides away in a dark corner and cries. As educators think about and imagine the desperate situation the child finds itself in, they desire to make learning for resilience 'childlike' to offset the distressing abuse. One way to achieve this is by employing poetry in their research findings and teachings.

Research into child abuse has informed the above poem, demonstrating to adults, the emotional impact abuse has on the voiceless victim. As Aultman (2009) states: "Poetic representation can, indeed, better represent the speaker" (p. 1189). By reading poetry we join "the world of the story-teller" (Faulkner, 2007, p. 222). Poets want us to view our surroundings with different eyes, echoing Hirschfeld:..."each time we enter its [poems] wordwoven and musical intonation, we give ourselves over to a different kind of knowing: to poetry's knowing" (as cited in Faulkner, 2007, p. 218). Although poetry is "becoming the neglected genre", making way for "informational texts" in the classroom according to Seale (2015, p. 12), the value of poetry lies in the fact that poets "contribute to the

cultural, spiritual, and political health of society" (Faulkner, 2007, p. 222). Thoughts and feelings expressed in poetry "resonate" especially with children (Aultman, 2009, p. 1189), as it delights the imagination. The door to poetry must be unlocked for the developing child, for as Hopkins states: "Poetry...opens up a world of feeling for children they never thought possible; it is a source of love and hope that children carry with them the rest of their lives" (as cited in Danielson and Dauer 1990, p. 138). These thoughts and feelings of hope and 'knowing' can help to generate resilience and add to agency in a child.

Child agency

"Every child has the right to be listened to and to have their opinions taken seriously when decisions are being made about their lives" (UNICEF, n.d.)

Recently we have experienced a paradigm shift in the development of theories concerning childhood. Since recorded history it was alleged that children had 'no own voice' but were under the dominance and power of adults (Briggs, 2012, deMause, 1994, Sorin and Galloway, 2006). Children were considered a 'blank slate' which needed to be filled with knowledge (St.Thomas and Johnson, 2007) and skills to become an efficient part of society (Smith, 2011).

A considerable change in society began in the 1830s and became noticeable in changing ideologies of childhood after World War Two. Instrumental in this transformational paradigm was the publication by Goldstein, Freud and Solnit (1973): "Beyond the best Interests of the Child" (Spinak, 2007). This generated a plethora of research into social protection laws for children, the proclamation of children's rights, psychological research into mother-child relationships, parenting books, distinctive children's books and school texts, and finally antiauthoritarian education to establish a 'happy childhood' (Dekker et al., 2012). Theories of childhood development and learning advanced. The classic theories of child cognitive development in stages were proposed by Erikson, Piaget, and Vygotsky (Kail and Cavanaugh, 2019). Bronfenbrenner theorized about the influence of the environment on children and Gardner on the existence of multiple intelligences (Kail and Cavanaugh, 2019). These theories of childhood development and human intelligence have provided guidelines for teachers and parents. Similar to the changing relationship of child to adult, the discovery of 'self' emerged (Frijhoff as cited in Dekker et al., 2012). With this insight came the realization, that rather than projecting the adult's wishes, or society's or cultural expectations onto the child, it is imperative to help children develop their inborn potential. Modern philosophies suggest giving the child agency modeled to their ability and stage of development.

Previously research had concentrated on individual agency (Bandura, 2001). Bandura (2017) extended this concept further to include 'proxy agency' [if no direct control can be exercised, then others can be engaged to achieve a certain goal] and 'collective agency' [a group effort can bring the desired results for a 'common purpose'] (Bandura, 2001; Bandura, 2017). In agreement with Bandura (2017) Kumpalainen, Lipponen, Hilppö, and Mikkola (2014) state that agency is socio-culturally conditioned. This could mean that children in a certain environment might be more restricted in the way they are permitted to show agency. Research has found that children have limited agency in educational settings to "express, reflect and develop their own perspectives" (Hilppö et al. (2016). However, a variety of efforts are made to encourage children to make decisions or handle problems, individually or in groups. The National Quality Standard Professional Learning Program (2013), promotes independence and agency, while listening respectfully to children and implementing their ideas into daily activities. Dynamic action between children and adults is encouraged. In clinical settings the child is seen, not as a 'passive recipient' of treatment, but as a competent social actor who shows resourcefulness and understanding of treatments (Dedding et al., 2014). Brummert-Lennings and Bussey (2017) echo St. Thomas and Johnson's (2007) statement that "children have an uncanny ability to draw directly from the unconscious content of their life" (p. 10). They are "extremely creative, possessing a great deal of insight and knowing" (Ibid, p. 10). Therefore children's perspectives are taken into account, when the focus is, for example on domestic violence children have witnessed. Not only have abused children supported the abused mother but they have also encouraged mothers to leave the abuser (Katz, 2015). They have taken action, and shown confidence and self-esteem (Brummert-Lennings and Bussey, 2017; Houghton, 2015). In Family Court procedures, children's voices may be heard as there is "inherent value in the contributions children make to assessment and decision-making" (Macdonald, 2017, p. 3). The following poem continues to address this issue.

Poem continued

In the following shape-poem the concept of "no voice" of children, is moved to children having agency. The child becomes aware of the possibility of change. The child says: "I can, I can make a difference".

I I can

- I can speak I can speak up I can draw a picture I can make a vital choice I can have a voice I can heal me
- I can love
- I can
- Ι

Poem completed

The child has experienced that someone listened and helpfully reacted.

He hits mum, he hits me - I He hits mum, he hits - I can He hits mum, he - I can speak He hits mum - I can speak up He hits - I can draw a picture He - I can make a vital choice He hits - I can have a voice He hits mum - I can heal me He hits mum, he - I can love He hits mum, he hits - I can He hits mum, he hits me - I (Haring, 2014).

The above poem suggests that a perception of complete wholeness can be experienced when the child is given agency to develop self-esteem, a practice that can produce hope and happiness. This experience can be transformative as discussed in the next section.

Child abuse transformed

"Children who are victims of neglect, abuse, or abandonment must not also be victims of bureaucracy. They deserve our devoted attention, not our divided attention" (Guinn, K. Quotes (n. d.))

There are millions of children abused worldwide (300 million in 2009), as cited in Briggs, 2012, p. 1) and one way of understanding and dealing with abuse is through art. Child art promises insight into the impacts of abuse on children because children might avoid talking about the abuse or to name the abuser. Peterson and Hardin (1997) developed a "Guide for Screening Children's Art", titled "Children in Distress", to help clinicians become aware of symbolic expressions of early child trauma when children cry out for help. Briggs urges teachers to identify these drawings, re-assuring the child and asking open or indirect questions (samples, p. 226); also to notify a child protection officer immediately if abuse is suspected. She advises teachers to discuss findings with a professional who had had training in reading drawings of abused children. Di Leo, a clinician and pediatrician (1983), equally speaks of his experiences with children whose "anger, void and unhappiness" was expressed in their drawings. He warns of over-interpretation of children's drawings, noting these as "but one item in a comprehensive evaluative procedure" (Di Leo, 1983, p. 202).

In this connection the latest development in the statutory child protection review is of definite importance: this states that the child and family must have the right to be heard (Fotheringham et al., 2013) when intervention is considered as it is not sufficient for case workers to only rely on theory, experience and the legal system in understanding the situation (Trotter as cited in Tilbury et al., 2007). Equally, advance has been made in childrearing practices. Research has attested that mothers who can 'mentalize' their children's state of mind are able to provide the care and support young children need to find secure attachment (Ensink et al., 2017) ['Mentalizing' is the ability of the human mind to imagine and interpret the mind of others, their thoughts and feelings or reasons for their behavior and one's own reactions to it (Katznelson, 2014)]. The mother-child relationship is based on the biological need of the child to be protected and cared for. If the child is securely attached to the carer as attachment theory states (Bowlby, 1980), then this secure attachment positively influences relationships in later life (Zilberstein, 2014). To increase the mother's sensitive reactions to the child as in reflective parenting, secure attachment can be achieved by psychosocial treatments termed: 'The Circle of Security' (Mercer, 2015), enabling the child to trust in its own abilities to take an agentic stance in life. This again is a positive outlook as a parent/ child interactive approach should provide the best care society is able to offer for the future by drawing on and implementing knowledge from the experiences of the past (Coholic and Eys, 2016; Fotheringham et al., 2013; Lee, 2017). Arts-based interventions may be a beneficial way for teachers to encourage children's agency.

The importance of arts-based interventions

"The processes which by art-based interventions are implemented vary greatly, but all are unified by the intent to promote healing in the individual" (Meyer, 2012).

Teachers who are equipped with knowledge about child development can use arts-based approaches that may illicit child trauma. These allow the child to express that trauma, thus giving the child agency, as reality is transformed through art. Malchiodi (1998), an art therapist, encourages teachers, parents, social workers and psychologists to use arts-based interventions in their work. Creating Art is not only an expressive exercise for children but also a healing one (Alter-Muri, 2017). Research has found that art activities are a necessity for children's cognitive

development, equally giving them the opportunity to express their traumatic experiences (Alter-Muri, 2017; Haring et al., 2018). As children communicate their fear, frustration, distress, resilience and hope for the future, they explore the reality they were living in or imagined. Arts-based intervention programs have been developed for professionals who work with traumatized children. Coholic and Eys (2016) report from their social work research that the arts-based mindfulness group program HAP (Holistic Arts-Based Program) has the potential to help vulnerable children develop emotion regulation, coping skills and further self-esteem. Equally, play-based and arts-based activities have been found to help children who experience domestic violence. The program "My Happy Ending", with a focus on multicultural diversity, includes storytelling, clay-work, drama and finally drawing/ painting (Lee, 2017). As many children are unable to communicate their experiences verbally, they might open up in a respectful, non-threatening situation that arts-based interventions offer.

Research has revealed that rather than talking or writing about their experiences, drawing is especially beneficial as it completely engages children (Haring, 2012). Drawing involves concentration, imagination and creativity. The healing effect of drawing helps traumatized children, due to entering a time and space of liminality (Haring et al., 2018). Comparable to the flow state or the mindfulness meditation experience, time, space and the Self seem to dissolve. A common denominator, researchers have found, is the 'fun' aspect that all children naturally enjoy (Coholic, 2011; Haring et al., 2018; Lee, 2017). Emotions, frozen in trauma, are released when children forget time and space while in the flow state during joyful arts-based activities (Vago and Zeidan, 2016). A sensation of complete wholeness can be experienced (Vago and Zeidan, 2016).

Conclusion

In this review the road of child-rearing throughout history, from infanticide to the acknowledgment of children's rights and to their agency, has been explored. It was found that the attitude to childhood and children as voiceless and powerless has been changed in recent times. Therefore it is important to add to teacher knowledge as teachers have additional responsibility in our challenging times. Due to their increased duty of care, teachers need to be aware of the wellness of their students, able to detect child abuse, trauma, and depression besides their teaching a subject and administering discipline. Teachers have to be aware of the significance and the consequences of child abuse for the future life of a child. When they are handed disturbing drawings by children in their care, they must be informed on how to respond, listen to and encourage children; whom to report to and contact for professional help.

When teachers, parents, and society respect the rights of children, a positive direction will be taken toward child agency. The full potential of the child can then be developed. Children's voices can be encouraged to be heard when arts-based interventions are validated in teaching programs. Effective undergraduate teacher training with emphasis on arts-based interventions aimed at stimulating child agency need to be implemented in training courses at universities.

Future research might concentrate on the evaluation of innovative programs helping children become aware of possibilities of having agency in distressing situations. A longitudinal study could explore the effects that arts-based interventions have had on children subjected to trauma in their early years. This may provide evidence for its effectiveness and the wellbeing of these individuals in their later lives. Further, as this review has primarily taken a Western stance, additional research could investigate other cultures' practices into childhood, child rearing, and child agency.

Data availability

No data were generated for this paper.

Received: 28 November 2018 Accepted: 11 April 2019 Published online: 14 May 2019

References

- Allen PB (1995) Art is a way of knowing. A guide to self-knowledge and spiritual fulfillment through creativity. Shambhala Publishers, Boston
- Alter-Muri SB (2017) Art education and art therapy strategies for autism spectrum disorder students. Art Educ 70(5):20–25

Ashton-Hay S (2005) Drama: engaging all learning styles. http://eprints.qut.edu.au.

- Atkinson ER, Dadds MR, Chipuer H, Dawe S (2009) Threat is a multidimensional construct: exploring the role of children's threat appraisals in the relationship between interparental conflict and child adjustment. J Abnorm Child Psychol 37:281–292. https://doi.org/10.1007/s10802-008-292
- Aultman LP (2009) A story of transition: using poetry to express liminality. Qualitative 15(7):1189–1198. https://doi.org/10.1177/1077800409338034
- Balaban V (2006) Psychological assessment of children in disasters and emergencies. Disasters 30(2):178–198
- Bandura A (2001) Social cognitive theory: an agentic perspective. Annu Rev Psychol 52:1-26
- Bandura A (2017) Toward a psychology of human agency: pathways and reflections. Perspect Psychol Sci 13(2):130–136
- Binder MJ (2011) I saw the universe and I saw the world: exploring spiritual literacy with young children in a primary classroom. Int J Children's Spiritual 16(1):19–35
- Binder MJ, Kotsopoulos S (2011) Multimodal literacy narratives: weaving the threads of young children's identity through the arts. J Res Child Educ 25 (4):339–363
- Bone J (2008) Exploring trauma, loss and healing: spirituality, Te Whariki and early childhood education. Int J Children's Spiritual 13(3):265-276

Bojuwoye O, Akpan O (2009) Children's reactions to divorce of parents. Open Fam Stud J 2:75–81

- Bowlby J (1980) Attachment and loss. Vol. 3: Loss, sadness, and depression. Basic Books, New York
- Briggs F (2012) Child protection. The essential guide for teachers and other professionals whose work involves children. JoJo Publishing, Australia, Docklands, Victoria
- Brummert-Lennings HI, Bussey K (2017) Personal agency in children: assessing children's coping self-efficacy in the context of parental conflict. Int J Behav Dev 41(3):432-443
- Chaffin M (2006) The changing focus of child maltreatment research and practice within psychology. J Soc Issues 62(4), 663–684
- Coady M (2017) Feminism and the development of early childhood education in Australia. In: Smith K, Alexander K & Campbell D (eds). Feminism(s) in Early Childhood: Using Feminist Theories in Research and Practice. Perspectives on Childhood and Young People Series, Vol 4, Singapore: Springer, (pp. 11–24). https://doi.org/10.1007/978-981-10-3057-4_2
- Coholic DA (2011) Exploring the feasibility and benefits of arts-based mindfulnessbased practices with young people in need: aiming to improve aspects of selfawareness and resilience. Child Youth Care Forum 40:303–317. https://doi. org/10.1007/s10566-010-9139-x
- Coholic DA, Eys M (2016) Benefits of an arts-based mindfulness group intervention for vulnerable children. Child Adolesc Soc Work J 33(1):1–13. https://doi.org/10.1007/s10560-015-0431-3
- Coleman K (2012) Coping with childhood trauma: art as a policy strategy. https:// www.mcgill.ca/isid/files/isid/pb_2012_05_coleman.pdf

Colman AM (2003) Oxford dictionary of psychology. Oxford: Oxford University Press Danese A, Baldwin JR (2017) Hidden wounds? Inflammatory links between childhood trauma and psychopathology. Annu Rev Psychol 68:517-544.

- https://doi.org/10.1146/annurev-psych-010416-044208 Danielson KE, Dauer SC (1990) Celebrate poetry through creative drama. Read
- Horiz 31(2):138-148 Dedding C, Reis R, Wolf B, Hardon A (2014) Revealing the hidden agency of
- children in a clinical setting, Health Expect 18:2121-2128 Dekker JJH, Kruithof B, Simon F, Vanobbergen B (2012) Discoveries of childhood
- in history: an introduction. Paedagog Hist 48(1):1–9. https://doi.org/10.1080/ 00309230.2012.644988

deMause L (1994) The history of child abuse, sexual addiction and compulsivity. J Treat Prev 1(1):77-91. https://doi.org/10.1080/10720169408400029

deMause L, Fraad H, Kind MH (2005) The childhood origins of the Holocaust/ comment/comment. J Psychohist 33(3):204-231

- Di Leo JH (1983) Interpreting children's drawings. Brunner-Routledge, New York Dunn-Snow P, D'Amelio G (2000) How art teachers can enhance artmaking as a
- therapeutic experience: art therapy and art education. Art Educ 53(3):46-53 Eisenberg L (1981) Cross-cultural and historical perspectives on child abuse and neglect. Child Abus Negl 5:299-308
- Ensink K, Bégin M, Normandin L, Fonagy P (2017) Parental reflective functioning as a moderator of child internalizing difficulties in the context of child sexual abuse. Psychiatry Res 257:361–366

E9art (n. d.) https://hellopoetry.com/katherine-dury/

- Faulkner SL (2007) Concern with craft. Using Ars Poetica as criteria for reading research poetry. Qual Inq 13(2):218–234. https://doi.org/10.1177/ 107780406295636
- Fotheringham S, Dunbar J, Hensley D (2013) Speaking for themselves: hope for children caught in high conflict custody and access disputes involving domestic violence. J Fam violence 28:311–324. https://doi.org/10.1007/ s10896-013-9511-3
- Goldstein J, Freud A, Solnit AJ (1973) Beyond the best interest of the child. The Free Press MacMillan Publishing Co, New York
- Golomb C (2004) The child's creation of a pictorial world, 2nd edn. Lawrence Erlbaum Associates, Inc, USA
- Green J Quotes (n. d.) BrainyQuote.com. https://www.brainyquote.com/quotes/ julien_green_192101

Guinn K Quotes (n. d.) https://foreignpolicyblogs.com/2009/05/22/giving-victimsof-abuse-our-undivided-attention/

- Hannan J (2012) Child protection in family law services : how much do we choose to know? J Fam Stud 18(1):90–95. https://search-informit-com-au.elibrary. jcu.edu.au/documentSummary;dn=740855178965381;res=IELHSS
- Haring U (2012) Exploring content, interpretation and development: making sense of children's drawings. (Unpublished Dissertation). James Cook University, Cairns
- Haring U, Sorin R (2016) The cyclone as catalyst. etropic 15.1 (2016): tropics of the imagination 2015 Proceedings | 89.
- Haring U, Sorin R, Caltabiano N (2018) Letting go in the flow: reflecting on children's liminality and trauma. Art/Research International: A Transdisciplinary Journal (in review)
- Haug F (2007) Towards a theory of gender relations. Social Democr 16(1):33-46. https://doi.org/10.1080/08854300208428303

Herman NJ (ed) (1995) Deviance: a symbolic interactionist approach. General Hall, Dix Hills

- Hilppö J, Lipponen L, Kumpulainen K, Ranio A (2016) Children's sense of agency in preschool: a sociocultural investigation. Int J Early Years Educ 24 (2):157–171. https://doi.org/10.1080/09669760.1167676
- Holt S, Buckley H, Whelan S (2008) The impact of exposure to domestic violence on children and young people: a review of the literature. Child Abus Negl 32:797–810
- Houghton C (2015) Young people's perspectives on participatory ethics: agency, power and impact in domestic abuse research and policy-making. Child Abus Rev 24:235–248
- Hubbard House (2010) Peace begins at home. https://hubbardhouse.wordpress. com/2010/09/10/peace-begins-at-home/

Jenks C (2005) Childhood 2nd edn. Routledge, London

- Juan S, Stevens I (2009) Evolution of childrearing and deMause's helping mode: an Australian case study. J Psychohist 37(1):27–32
- Kail RV, Cavanaugh JC (2019) Human development. A life-span view, 8th edn. Cengage Learning, Boston
- Katz E (2015) Domestic violence, children's agency and mother-child relationships: towards a more advanced model. Child Soc 29:69–79

Katznelson H (2014) Reflective functioning: a review. Clin Psychol Rev 34:107-117 Kitzmann KM, Gaylord NK, Holt AR, Kenny ED (2003) Child witness to domestic

violence: a meta-analytic review. J Consult Clin Psychol 71(2):339–352. https://doi.org/10.1037/0022-006x71.2.339

- Kumpulainen K, Lipponen LHilppö, Mikkola A (2014) Building on the positive in children's lives: a co-participatory study on the social construction of children's sense of agency. Early Child Dev Care 184(2):211–2298. https://doi. org/10.1080/03004430.2013.778253
- Lancy, DF (2012) Unmasking children's agency. SSWA Faculty Publications. Paper 277. http://digitalcommons.usu.edu/sswa_facpubs/277
- Lee J (2017) Responding to children in situations of family violence: narrative therapy group work with children. Int J Narrat Ther Community Work 1:57–70
- Legano L, McHugh MT, Palusci V (2009) Child abuse and neglect. Curr Probl Pediatr Adolesc Health Care 39(31):e1-31.e26
- Leppma M, Szente J, Brosch MJ (2015) Advancements in addressing children's fears: a review and recommendations. Prof Couns 5(2):261–272. https://doi. org/10.15241/ml.5.2.261

- Lutzker JR, van Hasselt VB, Bigelow KM, Greene BF, Kessler ML (1998) Child abuse and neglect: behavioural research, treatment, and theory. Aggress Violent Behav 3(2):181–196
- Macdonald GS (2017) Hearing children's voices? Including children's perspectives on their experiences of domestic violence in welfare reports prepared for the English courts in private family law proceedings. Child Abus Negl 65:1-13
- Malchiodi CA (1998) Understanding children's drawings. The Guilford Press, New York
- McNiff S (1998) Art-Based Research. Jessica Kingsley Publishers, London
- Mercer J (2015) Examining circle of security: a review of research and theory. Res Soc Work Pract 25(3):382–392. https://doi.org/10.1177/1049731514536620
- Messinger H (ed) (1988) Langenscheidt new college dictionary. Langenscheidt, New York
- Meyer AA (2012) Perceived benefits of art-based interventions and nursing implications: a systematic review. Antonian Scholars Honors Program. 18. https://sophia.stkate.edu/shas_honors/18
- Miller A (1987) The feeling child. https://www.alice-miller.com/en/the-feelingchild/
- Moustaki N (2001) The complete idiot's guide to writing poetry. A Pearson Education Company. alpha books, USA
- National Quality Standard Professional Learning Program (2013) Promoting independence and agency. National Quality Standard Professional Learning Program e-newsletter 64
- Nicastro EA, Velasco-Whetsell M (1999) Children's fear. J Pediatr Nurs 14 (6):392-402
- Øverland K, Thorson AA, Størksen I (2012) The beliefs of teachers and day-care staff regarding children of divorce: a Q methodological study. Teach Teach Educ 28:312–323
- Parton N (1985) The Politics of Child Abuse. Macmillan, London
- Peterson LW, Hardin ME (1997) Children in distress. A guide for screening children's art. Norton and Company, New York
- PLAN International (2017) International day of the girls. https://planinternational.org/because-i-am-a-girl/international-day-of-the-girl#
- Potter CN (2000) He just bumps into things: recognizing and reporting signs of child abuse. PT 8(4):52-62
- Powell MN, Smith AB, Taylor N (2016) Rural childhood in New Zealand: a unique site of children's agency and social participation. Child Aust 41(4):275–284. https://doi.org/10.1017/cha.2016.32
- Rubin JÂ (1984) Child Art Therapy. Understanding and helping children grow through art, 2nd edn. Jan Nostrand Reinhold Company, New York

Rubio-Marin R (2014) The achievement of female suffrage in Europe: on women's citizenship. Int J Const L 12(1):4–34. https://doi.org/10.1093/icon/mot067

- Seale T (2015) Why teach poetry? Engl J, High Sch Ed; Urbana 104(4):12-14
- Seideman RY, Hutchinson B, Buckner SK, Myers ST, Miller-Noyle D, Macrobert M, Heath S (1998) The response of children to disaster: do children have a greater depth of response to tragedy than we realize? Am J Matern/Child Nurs Issue, 23(1):37–44
- Shen Y-J, Sink CA (2002) Helping elementary-age children cope with disasters. Prof Sch Couns 5(5):322–330
- Silverman W, La Greca A (2002) Children experiencing disasters: definitions, and predictors of outcomes. https://www.researchgate.net/profile/Annette_La_Greca/ publication/232450979_Children_experiencing_disasters_Definitions_reactions_ and_predictors_of_outcomes/links/55c89b6e08aea2d9bdc906a1.pdf. https://doi. org/10.1037/10454-001
- Simmons RH (2014) The emergence of psychogenic mode # 7: emotionally literate. An addition to deMause's psychogenic theory of history. J Psychohist 42 (1):44–54
- Simon TR, Shattuck A, Kacha-Ochana A, David-Ferdon CF, Hamby S, Henley. M, Finkelhor D (2018) Injuries from physical abuse: national survey of children's exposure to violence I-III. Brief report. Am J Prev Med 54(1):129–132
- Smith K (2011) Producing governable subjects: images of childhood old and new. Childhood 19(1):24–37. https://doi.org/10.1177/09075682114012434

- Sorin R (2005) Changing images of childhood-reconceptualising early childhood practice. Int J Trans Childhood 1:12-21
- Sorin R, Galloway G (2006) Constructs of childhood: constructs of self. Child Aust 31(2):12-21
- Sosteric M (2013) Sociology versus psychology-the social context of psychological pathology and child abuse. https://www.sociology.org/sociology-versus-psychology-the-social-context-of-psychological-pathology-and-child-abuse/
- Spinak J (2007) When did lawyers for children stop reading Goldstein, Freud and Solnit? Lessons from the twentieth century on best interests and the role of the child advocate. American Bar Association. Fam Law Q 41:393-411
- St. Thomas B, Johnson P (2007) Empowering children through art and expression. Culturally sensitive ways of healing trauma and grief. Jessica Kingsley Publishers, Philadelphia
- Tilbury C, Osmond J, Wilson S, Clark J (2007) Good practice in child protection. Frenchs Forest, Pearson Education Australia, NSW
- Tomison AM (2001) A history of child protection: back to the future. Fam Matter: Aust Inst Fam Stud 60:46-57
- Tort C (2008) A schizophrenic yet useful monograph on infanticide. J Psychohist 36(2):186–189
- UNICEF Australia (n. d). Child's rights for children. https://www.unicef.org.au/ our-work/information-for-children
- UNICEF Humanitarian Action for Children (2017). Overview. https://www.unicef. org/publications/files/HAC_2017_Overview_ENG.pdf
- UKIP-Using Knowledge in Practice (2014) The emotional impact of child abuse and neglect. www.uq.edu.au.
- Vago DR, Zeidan F (2016) The brain on silent: mind wandering, mindful awareness, and states of mental tranquillity. Ann Acad Sci Issue 1373:96–113. https://doi.org/10.1111/nyas.13171
- Walsh K, Laskey L, McInnes E, Farrell A, Mathews B, Briggs F (2011) Locating child protection in preservice teacher education. Aust J Teach Educ 36 (7):31–57. https://doi.org/10.14221/ajte.2011v36n7.1
- Zhao G (2011) The modern construction of childhood: what does it do to the paradox of modernity? Stud Philos Educ 30:241–256. https://doi.org/10.1007/ s11217-010-9213-8
- Zilberstein K (2014) The use and limitations of attachment theory in child psychotherapy. Psychotherapy 51:93–103. https://doi.org/10.1037/a0030930

Additional information

Competing interests: The authors declare no competing interests.

Reprints and permission information is available online at http://www.nature.com/ reprints

Publisher's note: Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.

Open Access This article is licensed under a Creative Commons Attribution 4.0 International License, which permits use, sharing, adaptation, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons license, and indicate if changes were made. The images or other third party material in this article are included in the article's Creative Commons license, unless indicated otherwise in a credit line to the material. If material is not included in the article's Creative Commons license and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder. To view a copy of this license, visit http://creativecommons.org/ licenses/by/4.0/.

© The Author(s) 2019