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The role of emotions in building new knowledge and developing young children's understanding

Abstract

This article considers the role of emotions in the creation of new knowledge and the development of young children's minds. Drawing on recent literature relating to emotions and emotional development and recent research into rhizomatic thinking, the authors argue that emotions are more important within cognitive development than is currently recognised. They challenge the traditional propensity for prioritising rationality and essentialism within the construction of new knowledge, claiming this merely promotes hegemonic, discursive and binary pedagogies within early education, leaving little room for originality, difference and diversity. The authors explore the possibility that these dominant discourses impoverish children's thinking and truncate their development. Furthermore, they suggest that emotions are political and strongly influential within issues pertaining to social justice and (in)equitable practice. They consider how the constant controlling, downplaying or disregarding of emotions can effectively impact on who is silenced and privileged within early years education. Having an awareness of the possible interplay between thinking, cognition, forming new knowledge and emotions, provides educators with opportunities to challenge and address issues of power and social justice within practice. The article encourages educators to (re)conceptualise children's thinking and accommodate alternative readings and multiple pathways to sense and meaning drawn from children's experiences.

Keywords

Thinking, cognition, emotions, power, rhizoanalysis, early childhood

Thinking...context...introduction...

The purpose behind this article is to consider in more depth the connection between thinking and emotions. The role that emotions play whilst children build new knowledge and develop their thinking emerged through previous research (Author and Author, 2016; Author, 2017); yet further

investigation highlighted that these connections are so often overlooked. As a society we prioritise knowledge and reason which leaves little room for emotion, feelings (the more rational response that we give to an emotion) and empathically-based encounters; yet without the influence of emotions, knowledge and thinking is sadly impoverished (Stenberg, 2011) in fact Damasio's (1995; 2000) research suggests emotions and feelings are both necessary for rationalising, decision-making and an individual's sense of identity, sense of self. In this article we consider the relevance of this to our responsibilities both as educators of the very young and mentors of students who are training to take on this role.

It is universally accepted that the early years in a child's life are both particularly impressionable and important in laying the foundation for future ways of thinking and being, for instance (Sylva et al., 2004) highlights the importance of quality early years provision on children's development, academic outcomes, including cognitive ability. Olsson et al. (2013) underpins the long term impacts of early years experiences to mental health, social connectedness and general well-being. Fraley, Roisman and Haltigan (2013) and Raby et al. (2015) chart impacts on social and cognitive outcomes from early experiences, strong attachments and relationships into adulthood. Further discussions on brain development and social and emotional resilience built through early interactions appear in works such as Gopnik (2009), Shonkoff and Levitt (2010), NCDC (2011), Gerhardt (2015) and Music (2017). Essentially, Gopnik (2009, 14-15) describes early impacts rather well stating "our brains are the brains that were shaped by experience, our lives are the lives that begin as babies our consciousness is the consciousness that reaches back into childhood". Therefore, for early years educators it is imperative that there is an understanding that the underpinning messages that children receive and that are enforced within their early lives, regarding thinking and emotions for example, will have long term implications as previously discussed. For early years educators however, the issues surrounding the topic of emotional expression is twofold. Firstly, without proper acknowledgement of the role emotions play with regard to cognitive development, to say nothing of personal, social, emotional and

communication development, how can educators effectively understand, plan for and facilitate appropriate provision to meet the needs of all children? However, a second consideration emerges through recent research, Hodgkins (2019) for example, who considers that early years educators need a developed or “advanced” sense of empathy and emotional understanding, in order to achieve a level of professionalisation that effectively meets the needs of the children in their care. Hodgkins suggests that empathy and the ability to (re)connect with others emotionally is a key factor in truly understanding behaviour and the feelings that drive the actions and reactions of others. When practitioners have a greater awareness of emotions and empathy this helps them to facilitate authentic reciprocal interactions between children, enabling them to build the foundations for present and future successful social relationships. An awareness of the importance of emotions in our current neo-liberal knowledge-based economy (Moss, 2014) is essential if we are to challenge and reconceptualise ‘thought’, to open up possibilities of what it is possible to think, and challenge the hegemony of dominant, discursive and dogmatic cognitive discourse (Deleuze, 1994).

This article, therefore, is an exploration of the important role emotions play in building new knowledge, developing and supporting young children’s thinking and consequently the impacts this has on their growing understanding of their world. It will further address ideas of power, and relevant issues of control and social justice to explore who is silenced and who is privileged within our current education systems. Drawing upon recent empirical research (Author and Author, 2016; Author, 2017), this article considers the possible interplay between thinking and cognitive development, the formation of new knowledge and the role of emotions and feelings. The article has been written as four rhizomatic plateaus; this means that you do not need to be confined to a linear approach to reading it. Start with any plateau, move to any plateau as your mind takes you. You decide the journey you take through the whole. It also (re)introduces rhizoanalysis as a potential way in which unexpected, or unpredictable connections and alternative readings and multiple pathways, might be acknowledged and accommodated within our understanding of our practice with young children.

Thinking...knowledge...emotions...

As a society we have become obsessed with the acquisition of knowledge and with the notion that this provides a form of both human and social capital and power, which can be employed to shore up socio-economic growth and security and allow the country to compete more effectively at global levels (Gillies, 2011; Biesta, 2013; Moss, 2010, 2014; Campbell-Barr and Nygard, 2014). Moss (2014) suggests that as a result of the current propensities of our knowledge-based economy, priority is given to western neo-liberal values based on rationality and essentialism in all areas of life. Within this social context Andrew (2015), Stenberg (2011), Osgood (2010) and Nodding (2013), all note that overly prioritising knowledge acquisition, intellectual capacities, rationality and logic, often results in overlooking the role of emotions and creative expression in the generation of new knowledge. Stenberg (2011) and Nodding (2013) explain how this leaves values founded on compassion, empathy and an ethics of caring, marginalised and undervalued; this then impacts on Early Childhood Education (ECE) policy and practice (and society in general). Furthermore, it positions some emotions as “outlawed” and irrational (Stenberg, 2011: 350). Stenberg (2011: 352) explores Aristotle’s suggestion that there was a connection between emotion, reason and relational experiences; that any new experience generates an emotional response which serves to create impressions and representations. These are then mediated, regulated and constrained within rational and logical thinking. However, Andrew (2015) argues that this binary reason over emotion way of thinking creates many misconceptions around emotion, one of which is that emotions are less reliable than rationality. Deleuze (1994: xiv) suggests that whilst this may be a “classic image” of thinking, if this image remains unproblematised then it may never be reconceptualised to accommodate otherness and may never offer a challenge to hegemonic and discursive discourse. Deleuze (1994: 217) further claims dogmatic thought “crushes thought under an image which is that of the same...profoundly betraying what it means to think”. This view offers neither a critique of thought nor a recognition that thinking itself is an encounter, where ideas occupy multiplicitous and often opposing spaces where new possibilities emerge. Furthermore, Damasio (1995; 2000) research suggests despite the propensity to separate

rationality and emotions, the two need to function together, with rationality greatly impaired without acknowledging the relationship between cognition, emotions and feelings.

Governments and International bodies such as the Organisation for Economic Cooperation and Development (OECD) and United Nations Educational, Scientific and Cultural Organisation (UNESCO), have become increasingly interested and involved with education policy and legislation at every level, including that of ECE. They serve to provide an officially sanctioned consensus for *what* children can think and *how* they should think it, alongside a universal vision for what 'normal childhood' and 'normal development' should entail. Fulfilling this predetermined and predefined universal vision of education, therefore, becomes the priority for the early educational practitioner. There emerges a right way to think, teach and learn and right ways to express thinking and learning, with right answers founded and reflecting the (neo-liberal) values priorities of these governing bodies. Anything that sits outside of these parameters, is undervalued, off-task or simply wrong, otherness is funneled into the same and learning is reduced to re-treading preexisting, predetermined pathways (Hargraves, 2014).

The Early Years Foundation Stage (EYFS) (Department for Education (DFE) 2017) recognises social and emotional development as a prime area of importance in ECE. However, early years practitioners and educators regularly experience top-down pressure via Ofsted inspections, regulatory policies and surveillance practices which serve to remind them of the importance society places on cognitive skills and related intellectual capacities, such as competencies within maths and literacy. Moss (2010) refers to this as the *schoolification* approach to ECE. Murray and Palaiologou (2018) point out that this causes a potential dichotomy. Neo-liberal and binary concepts of rationality, essentialism and knowledge acquisition, (and how this relates to human capital and the social power needed to compete within the global market) occupies one stance, whereas, the importance of emotional responses on thinking, knowledge, sense and meaning occupies another. Therefore, publications such as OECD (2015) and The National and Scientific Council for the Developing Child (NSCDC) (2011), which place

importance on a balance of both emotional and cognitive development; seeing the skills of both as of equal importance for children and young people in reaching their full potential and making a positive contribution to society, are much needed. Therefore, the NSCDCs (2011) argument on the centrality of emotions and emotional experiences in developing thinking, cognition and children's overall wellbeing, during times where there are interrelated developments physically, cognitively and within communication, is timely indeed.

The NSCDC (2011: 2) states that "For some children the preschool years mark the beginning of enduring emotional difficulties and mental health problems that may become more severe than earlier generation of parents and clinicians ever suspected". Unfortunately the paper goes on to argue that this potential risk is consistently downplayed, disregarded and ignored by governments in ECE policy and legislation. This is reminiscent of Stenberg (2011: 351) who claimed the value of emotions within encounters was imperative lest we "impoverish our own understanding of how we come to orient ourselves to one another in the world around us". Winans (2012) argue that there is a causal relationship between thinking and emotion which suggests it makes little logical sense to consider them in isolation from each other. Therefore, the question remains whether considering the concepts of thinking, reason, rationality and emotion as separate encourages an incomplete and insufficient picture of the complex phenomenon that is children's thinking, and how they create sense and meaning from their experiences of the world around them. Lindon and Brodie (2016, p.4) observe that children are naturally more holistic in the way they approach their learning, they have no innate inclination to separate out skills and capacities, however, they will quickly discern the priority and value that others place upon certain skills and ways of learning. Their reaction is an emotional one that seeks approbation. Educators need to be aware that their responses to children's connections and ideas will convey subtle cues and judgements about the 'rightness' of their thoughts and actions, which can serve to silence rather than support the emergence of other interpretations within learning.

Socio-cultural theorists such as Vygotsky (1978, 2004), Bruner (1986) and Hedegaard (2012) argue that nothing and no-one can be considered in isolation, we are all the sum of our interrelated experiences. Rhizomal analysis is a philosophical tool founded by Deleuze and Guattari (1987) that encourages educators and researchers to travel nomadically through plateaus of intensity, exploring conceptual pathways and territories that may not at first appear connected, in order to reconceptualise the effects of interrelated encounters in more complex and multiplicitous ways. This offers greater credence to using rhizomatic approaches as a credible lens for children's experiences; viewing them as interconnected webs, with sense and meaning emerging within the relationships between each experience (Deleuze and Guattari 1987). The fact that educators are expected to assess children's learning and development individually leads to a certain degree of separation from contextual factors such as families and communities. In contrast, rhizomatic perspectives focus on a Deleuzio-Guattarian (1987) sense of 'becoming' in relationship to contextual factors and the learning and development that emerges within and because of these experiences and encounters. Just as Deleuzio-Guattarian assemblages connect a multitude of "decoded fragments", produced by and within the fabric of life (Deleuze and Guattari's 1987: 586) (meaning that if one thing was to be taken away the affect would encompass the whole) the reverse may be true. If we do not consider emotions and their impact on cognition, sense and meaning within relational encounters, then, potentially, the assemblage is not complete, and the impact of this will encompass the whole child.

Denham, Bassett and Zinsser (2012: 138) argue that early years educators have a greater responsibility in the emotional socialisation, not only due to the potential, lifelong impact that NCSL (2011) warn of during this phase, but also due to the increased time young children spend in educative settings in our current economic climate. Galligane and Han (2015) suggest that young children who can apply emotional knowledge have more sophisticated inter and intrapersonal skills implying a correlation between developing an emotional maturity (through socialisation) and the present and future development of academic skills and capacities.

However, the OECD (2015) maintains that emotional socialisation is not an easy undertaking, as was touched upon at the conclusion of the previous plateau. Nationally and internationally there is no real consensus on how best to achieve emotional socialisation as cultures vary so significantly. The OECD (2015: 15) claim that whilst cognitive skills may predict children's academic trajectories and "labour market outcomes" their socio-emotional skills play a vital role in health and "subjective wellbeing". As a result, they determine that when viewed together, cognition and socio-emotional skills "crossfertilise and further enhance positive outcomes later in life". The OECD argue that viewing either in isolation is no longer coherent and that to continue to do so may result in attainment gaps appearing that would have a significant impact upon social and economic disadvantage.

It is important to move beyond rationalism, essentialism and market-based ideals to what Ritchie (2017: 288) refers to as "new approaches to learning for greater justice, social equity and global solidarity". The propensity to focus on technicist and hegemonic practices, rationalism, essentialism and developmental psychology has, in fact, privileged knowledge and reason, with practices that alienate otherness, narrow possibilities or alternative 'truths' and lessen respect for the surprising or unusual relational encounters. Rhizoanalysis, as defined through a Deleuzio-Guattarian (1987) lens, allows educators to reconceptualise the ways in which thinking and emotions are considered, and take account of the interconnectedness and more complex picture represented. It embraces sense and meaning differently which opens up pathways of possibility that might have been previously disregarded. Thinking, theorising and working within rhizomes opens the potential for new possibilities to emerge, which sometimes requires a suspension of disbelief, a comfortableness with uncomfortableness, and a (re)negotiation of the many lines of flight to sense and meaning. As early years educators this means nurturing, rather than suppressing, what is rationally considered as children's 'flights of fancy' and carefully considering the powerful and often suppressing role that educators play. Consider, for example, Hargraves' (2014: 325) reports of a boy whose rhizomatic thinking connected earthquakes with "sharks and monsters punching up through the ground". This overlaying of fact and fantasy could be potentially judged off-task or nonsense by practitioners with a

particular teaching point to communicate, nevertheless when viewed rhizomatically or through Deleuzo-Guattarian (1987) lens of non-sense, the account 'becomes' an emotionally resonant and cognitively viable thinking process.

As May (2005: 172) suggests, rhizoanalysis embraces an "ontology of difference" where the unpredictable, the random, the remarkable 'otherness' in all its forms, can be accommodated and acknowledged in authentic, socially just encounters. Embracing otherness rather than grasping and funnelling encounters into versions of sameness, offers a proactive step in responding authentically to children's diversity, uniqueness and difference, but it can be an uncomfortable process. It is hard to ignore that sameness and conformity offers a sense of safety that can be a powerful and understandable inducement for perpetuating thinking and practices that codify thinking into binary positions and rational, logical conclusions, whereas originality and difference have no real place or importance. Emotional responses inject a level of unpredictability and subjectivity into educational encounters that may not be comfortable and may not appear rational or logical, however, there is the possibility of a greater authenticity and richness to these encounters that may normally be disregarded or missed. Conformity can silence the voice of and in so doing prevent children from mapping new worlds, creating new knowledge and envisaging new possibilities that may change their future world (Gopnik, 2009: 21).

Much like Piaget (1950, 1951) who posited the concept of cognitive conflict as a driving force behind development and learning, educators may have to more confidently embrace feelings of discomfort in order to reimagine and reconceptualise personal and professional encounters allowing greater space for emotion. Deleuze and Guattari (1987) suggest that by continually asking "and...and...and" rhizoanalysis does not simply replace one dominant regime with another but accommodates all approaches, allowing sense and meaning to emerge within the process. Essentially, rhizoanalysis encompasses many pathways to knowledge, allowing them to function simultaneously as truths. The importance is placed on relational encounters or assemblages, where emotions along with many other

seemingly disparate elements of life (human and non-human), combine and interweave, connecting and reconnecting in a multiplicity of meaning (Deleuze and Guattari, 1987: 299-304; O'Riley, 2003; Cummings, 2015). Author and Author (2016) and Author (2017) for example, consider potential implications of a journey into and within rhizomes in order to offer a (re)conception of young children's thinking, cognitive development and the ways in which they construct sense and meaning.

Outlaw emotions...irrationality...social justice...oppression...

Emotions are political and in many respects sites of social justice. For example, in Western society there is a hierarchy to emotions, we are more comfortable with happiness, excitement and joy and less comfortable with anger and sadness. Stenberg (2011) claims that many emotions are written off and/or reduced to 'irrational displays' that are attributed to those of inferior rationality, which, Stenberg notes, are most usually marginalised groups such as women and children. Such is the power balance seen in the classroom, where the teacher assumes the voice of authority and reason. Undesirable emotions are considered "outlawed" and become "sites of oppression", regulated and controlled by the more rationally competent in line with social norms (Stenberg, 2011: 350). From a Freirean (1994) perspective the questions of who gets to decide what constitutes acceptable emotional responses, who is privileged and who is silenced within this, is more than relevant and has serious implications for social justice. For instance educator responses to what might be perceived as potentially inappropriate emotional behaviour, such as found in Stratigos (2015) where a young child's desire to affect their world though what could be misunderstood or misinterpreted as subversive behaviour, impacting on the way educator's might view, interact and therefore provide for this child in the future.

Outlaw emotions can provide opportunities for "political resistance" and social justice (Stenberg, 2011: 350) and Winans (2012: 151) argues that it is emotion that allows individuals to challenge entrenched beliefs, moving from states of "mindlessness regarding difference and diversity to greater mindfulness". This implies that the influence of emotions, including outlaw emotions, on thought and thinking is more significant to relational encounters than expected or credited. Furthermore, both

Winans (2012) and Andrew (2015) argue that emotions play a prevailing role in the potential to renegotiate power and understand and embrace difference within authentic embodied experiences, as further seen in Stratiogs (2015) study. When viewed through a Freirean (1994) lens, educators need to support children in renegotiating power and challenging inequitable or imbalanced perspectives otherwise children will merely perpetuate the silence and privilege.

Young children can and do use outlaw emotions as sites of social justice and as a means to powerfully affect their world and the sense and meaning that they draw from relational encounters. The impact of this can be seen in a previous paper by the authors (Author and Author, 2016), where there is reference to a child expressing resistance and rebellion at being left at pre-school through the emotions of sadness and anger. Alongside this was the work of Stratigos (2015) who relays the story of a child using sadness and anger at being denied access to a bear cave the other children were playing in. If mismanaged or misunderstood these powerful expressions in children are 'written off' within the deficit child image (Rinaldi, 2006: 13) rather than being viewed as children using powerful mediums to rebel, resist and regain a measure of control and power in situations where they feel this is threatened. This 'writing off' can potentially silence children in ways that truncate their development and limit their self-expression. Displays of sadness, anger and frustration that carry physical expressions can leave educators feeling under-confident and ill-equipped to deal with where the child and their subversive behaviour may take them. Additionally, this can be an uncomfortable and threatening space for educators to embrace as they may not be comfortable with their own negative emotions. The energy expended in dealing with such conduct is considered emotional labour and well documented elsewhere (Tronto, 2011, Taggart, 2011; Elfer, 2012; Noddings, 2013; Andrew, 2015), as is the stress and perceived challenges of advanced empathic working (Hodgkins, 2019). Consequently, as Stenberg (2011) suggests, people revert to binary right/wrong judgements to apply reason in ways which will restore order and mitigate feelings of discomfort and/or inadequacy and this can apply to both educator and child within the same situation. This reflects Barad's (2007) notions

on diffraction and the resulting power relations that can emerge within relational encounters, as each party tries to (de/re)territorialise the reality of a situation into a more preferable one. On the surface this appears to reflect Stenberg's (2011: 352) observations of an Aristotelean approach where experiences generate emotions, which are then required to be mediated and constrained within logical rational thought. While Noddings (2013: 30) suggests that authentic, empathically-based encounters do not reason with or make 'other' function as the 'same', they "feel with other", this is a kind of "engrossment" that enables a different kind of communication that notes what is received and what has already been received within the exchange. Arguably, this could support Hodgkin's (2019) notions of advanced empathic working and Deluzes and Guattari's (1987: 301) notions of being and becoming in assemblage. However, Tronto (2013, 2015) argues that within Noddings' perspectives there is a danger for power imbalances and hierarchical relationships to emerge; a situation that would be counterintuitive to the purpose of honouring emotional encounters with children.

Tensions remain concerning *how* educators maintain a delicate power balance within reciprocal encounters with children both through emotional labour as previously discussed and ubiquitous impacts of child-centred approaches. Essentially, Langdon (2010) maintains the empowerment of one (child or teacher) can lead to the oppression of the other (child or teacher) and that is to say nothing of who gets to decide in each and every moment. Whilst the responsibility remains with educators concerning how they respond in day-to-day practice, critiquing and reframing their image of the child (Rinaldi 2006) and children's actions, however emotionally charged (Author and Author, 2016; Stratigos, 2015), may offer a coherent way forward. Addressing their own emotional labour and monitoring their own emotional responses remains a challenge, although developing Hodgkins (2019) advanced empathic working may support educator's authentic reciprocal encounters. However, the need to take account of children and educator emotions alongside other development areas is clear. Toronto (2013, 2015) calls for more ethically caring encounters that encompass emotion and empathy, believing that people are essentially "homines curans-caring people" (Tronto, 2017: 31) and

that to imagine a morally just world where actions and decisions are not informed by emotions and empathy is impossible.

The EYFS (DFE, 2017) takes account of social and emotional development within the prime areas of the framework and there have, historically, been many social and emotional initiatives that have been implemented to support practice, such as SEAL (DCSF, 2005) and SEAD (DCSF, 2008). However, such approaches fail to apply to the full spectrum of emotions and the vital impacts they might have upon cognition and tend to be tokenistic in their approach. This is similar to the way that Langford (2010) identified child-centred pedagogy as control disguised as choice, instead of the child freedom, choice and agency it was purported to be. If emotions are curtailed in this way it could reduce practice to merely attempting to teach children *how* and *what* to feel and what emotions are worthwhile to cultivate, in the same way bodies such as the OECD, UNESCO and NSCDC form the consensus on what is relevant to *know* and *how* this should be expressed. It may be that despite the overwhelming evidence to support the importance of emotions in the generation of new knowledge, the healthy development of the brain and children's wellbeing in general, it will remain an espoused belief that is enforced within subtle but powerfully oppressive parameters. This concern is legitimized by the OECD's (2015) outline of which emotional skills are needed for the future labour market and its attempt to reach a consensus on the best way to facilitate this. The OECD (2015: 130) clearly states that "not all social and emotional skills exhibit positive social outcomes". Similarly, Wood's (2018) research suggests that current social and emotional programmes and interventions, such as SEAL and SEAD within primary schools, have the potential to curtail difference and may even become exploitive, with inequitable (re)distributions of power as they seek to 'guide' children's emotional responses through Foucauldian concepts of 'normalisation' and 'disciplinary power' (Wood, 2018: 887). This raises issues of social justice and inequitable practice.

As we observe society around us, we observe that it is not just outlaw emotions that are problematic, even the sanctioning of emotions that are viewed more positively is slowly emerging. In western

classrooms children are actively discouraged from expressing too much of any form of emotion that might potentially overwhelm, or any perceived heightened state or behaviour. Yet Ecclestone and Hayes (2019: vii) argue that the rise of the “snowflake generation” is due to the fact that children in the twenty first century have less emotional capacity and require more emotional support than any other generation. They add that with anxiety in childhood on the increase this will, inevitably, further impact upon emotional development.

Wood (2018) suggests that social and emotional learning and interventions are open to exploitation and emotional appropriation. This argument echoes Stenberg’s (2011) concerns with outlaw emotions, in that emotions and emotional responses are being codified, potentially leading to marginalisation within children’s experiences and the silencing of their voices. Stepping away from the obvious social justice ramifications, when viewed alongside research such as Damasio (1995, 2000, 2004), who claims emotions and feelings are essential components within cognition, rationality and decision-making, the impacts are clearly troubling. Continually marginalising emotions and behaviour policies that support an even keel and temperament, or an emotional blandness in our responses, encourages emotional atrophy. As Damasio’s research implies this has implications for thought development, decision-making and general cognitive function.

Damasio (2004) infers Platonian discourses of representation and recognition are so much at the forefront of thinking and education practices that there is little space to notice pain or pleasure; despite the fact that they are emotional bedrocks and how we draw meaning within our encounters, Damasio suggests that feelings are the least understood phenomena. Deleuze (1994: 172) mused that current educational systems promoted dogmatic thought; “thought which harms no one, neither thinkers nor anyone else” and the same dogmatic approach now applies within emotional discourse and how we link this to the development of thinking and thought. Conversely, Damasio would argue that it is both pain and pleasure which drives development behaviour and therefore governs our actions.

Gallingane and Han (2015) suggest that young children need to be able to express both positive and negative emotions for strong relationship building. They go on to argue that whilst children as young as three can understand and “distinguish between primary emotions” and their causes, as children grow and develop, more complex emotional responses become more challenging to decipher (Gallingane and Han, 2015: 353). Author (2017) argues that not only are children’s thinking and connections potentially different to adults, but children’s thinking may be more complex and expressed in more increasingly diverse ways than are recognised. Therefore, it calls into question whether children find complex emotions difficult to interpret or whether the level of complexity of their thinking leads to adults missing the ‘otherness’ in the way they express their understanding. This echoes Deleuze’s (1994) observation that non-sense or off-task thinking is simply a misunderstanding or misinterpretation which could be applied to the unique connections made by children.

A further complication is highlighted by Damasio (2004) who suggests that the issue is not merely with the differences between thinking and emotions but with the difference between feeling and emotion. Damasio (2004: 29) states “feelings are mental representations of events whereas emotions are the observable behaviour in response to events”, or emotions are apparent, whereas feelings remain internal. The link between emotions, feelings and thinking emerges as sensory information causes an emotive reaction, which is a necessary component in the assimilation and accommodation of new information, triggering a neurological response (pattern) in the brain which produces feelings and mental representations (Damasio, 2004: 58). This implies that the assimilation and accommodation of new knowledge requires the information garnered from the emotive responses (emotions) to sensory information within its formulation. Without this emotive response, the information collated from experiences may not be adequately processed and full understanding may be stunted. By downplaying the role of emotions within this process it is possible that cognitive development is truncated or opened-up to the potential for misinterpretation.

This view of the interplay between sensory information, experiences and emotive responses reflects the rhizomatic concept of haecceity as highlighted by Gale (2007) and St Pierre (2011). They explain this as where sense and meaning become drawn from the 'thisness' or the resonance within encounters that 'feel' the same or similar. Sense is often drawn from more than logic or reason, with non-sense becoming a different kind of sense from a Deleuzio-Guattarian (1987) perspective. Having an awareness of this both allows educators to nomadically follow children's lead in wherever their thinking is taking both child and educator, and the importance of emotion within the negotiated sense and meaning that is generated.

Current issues...emotional...language...eco-literacy...

The OECD (2015) claims that children and young people are facing challenges that previous generations have not had to contend with in order to face strong, socio-economically sound futures. Environmental pressure is one such issue and carries unexpected emotional overtones in terms of understanding the emotional 'fall-out' and the emotional language used when discussing the implications. If children are not supported in making strong connections between their thinking and their emotions (including 'outlaw' emotions) they may not possess the flexibility of thinking required to bring about the changes needed for an uncertain, "sustainability orientated future" (Richie, 2017: 289).

Jo McAndrews (2018) Facebook podcast expressed concern about how we are supporting children through climate change, in that the language used may in fact induce unhelpful stress, anxiety and disquiet for very young children. This relates to the current fascination with politics, which constantly streams into their lives warning about climate change, Brexit, racism, more recently covid 19 and other serious situations. The rhetoric that is emerging speaks of anger, insecurity, rage and other 'outlaw' emotions, bringing to mind the concerns raised by Dachyshy (2015: 32), who suggests language that is meant to challenge and (re/de)territorialize is often "hard", "strident" and even "violent". Whilst it is true that such language may inadvertently generate unhelpful imagery or connections that impact on the thinking of our children, it is important that strong emotions are

explained and explored 'with' children so that they have the opportunity to fully understand them in relation to their own emotional wellbeing. McAndrews (2018) suggests the answers lie in building communities, interconnectedness and relational encounters, where merely obeying is no longer a viable option. Children should be allowed space to use their voice and agency to 'manage' not only what is to come but what is happening now within this moment. Ritchie (2017: 289) claims that whilst some political world leaders may still prefer to bury their heads in the sand, claiming global concerns are mere myth, others agree that we are "entering the age of Anthropocene...where human activity is endangering the planet". Therefore, if we have not sufficiently supported children to employ both reason and emotion, intellect and feeling, then the kind of thinking that encourages the political resistance needed to readdress issues of power and social justice previously discussed by Stenberg (2011), Winans (2012) and Andrews (2015), may not be nurtured and the ability to challenge entrenched beliefs not present. Essentially, the silenced and the privileged will remain unchanged and unchallenged (Freire 1994). Without attention being paid to how emotions impact on thought, we cannot be sure what brain architecture is forming and who is silenced and privileged within this process. Furthermore, without understanding the connections children may be making that are the results of both rationality and emotion, we cannot truly appreciate the complexity of the phenomena that is children's thinking and meaning making.

The principles underpinning the Deleuzio-Guattarian (1987) rhizomatic concept are useful when (re)conceptualising how educators may accommodate the complexity of reason and emotion within children's thinking and negotiate the sense and meaning that emerges within relational encounters. Deleuze and Guattari (1987) suggest that by continually asking "and...and...and" all approaches and possibilities for sense and meaning can emerge and be embraced within the process. As a result children will be empowered to use desire and emotion to affect their reality (Author and Author 2016; Author 2017; Stratigos, 2015) and this then may impact on the sense and meaning they draw from their experiences and act upon in their encounters. The flexibility of the rhizomatic approach encourages educators to no longer curtail children's thinking within traditional parameters but also to

not abandon these, instead to allow for the interconnectedness of both. Deleuze and Guatari (1987: 299) suggest that “children’s questions are poorly understood if they are not seen as questioning machines”. We believe that children’s thoughts, thinking, feelings and emotions are poorly understood if they are not seen as thought-thinking-feeling-emotional beings. Rhizoanalysis allows us to acknowledge that children (in fact people in general) are made of an infinite number of assemblages, evolving from thought-thinking-feeling-emotional encounters, assemblages that all function individually and together and impact on how children powerfully affect, interact and relate to and with their world. We do not suggest that rhizoanalytical approaches to learning must replace all other approaches; if that were the case then we would simply be advocating one hegemonic pedagogy in place of another; in addition we would be attempting to introduce a totally foreign perspective upon power relations into the existing hierarchy of the early years classroom. However we do believe that rhizoanalysis and rhizome-thought could and should be considered as an alternative approach that may be able to encompass many of the current approaches in a multiplicitous “and...and...and” array of possibilities. At the very least we suggest that we, as educators, should be more open to the role that feelings and emotions can play in developing children’s thinking and more encouraging of them. Whilst acknowledging that this may, initially, add to the “emotion work” (Taggart, 2011) of early childhood, it also has the potential of eventually reducing it, as children become better able to understand, own and manage their own emotions.

Emotion and reason must be reunited in order for holistic development of young children's minds to occur and to prepare them for the future that has yet to be imagined. From a Deleuzo-Guattarian (1987) perspective children are in a constant state of ‘becoming’ in relationship with everything around them. It is from these spaces that children’s thinking and understanding of their world emerges. These are felt experiences and educators need to support children in honouring the rational and the full spectrum of emotional underpinnings within the development of new knowledge and the subsequent sense and meaning children draw from their experiences. The potential for power and social justice issues cannot be ignored in terms of emotional labour (Tronto, 2011, Taggart, 2011; Elfer,

2012) and potential hierarchical tensions on the educator (Langford, 2010; Noddings, 2013; Tronto, 2013, 2015). Furthermore, Wood (2018) and Eccelstone and Hayes (2019) highlight the potential for emotion appropriation and exploitation for children within developmental provisions. However, rhizoanalysis can offer a coherent way forward, the ability to (re)consider and (de/re)territorialize understandings of encounters so that many lines of flight and many functioning assemblages can be uncovered (Deleuze and Guattari, 1987). If educators could allow their own thoughts and process to be more nomadic and less mired in fixed and binary positions and neoliberal ideals, they could then follow children more equitably in their nomadic rhizome-thinking journeys. Together, educator and child could work the thinking-feeling-emotional rhizomes to more adventurous and truly transformative encounters (Massumi, 1992; Bachanan, 2000), where the impossible is possible, the as yet unthinkable is open for possibility and otherness is embraced in all its forms.

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