

**Crying Through the Ages:
A Developmental Perspective on Why Adolescents Cry**

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Notice 1

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General Declaration

Monash University

Declaration for thesis based or partially based on conjointly published or unpublished work

In accordance with Monash University Doctorate Regulation 17.2 Doctor of Philosophy and Research Master's regulations the following declarations are made:

I hereby declare that this thesis contains no material which has been accepted for the award of any other degree or diploma at any university or equivalent institution and that, to the best of my knowledge and belief, this thesis contains no material previously published or written by another person, except where due reference is made in the text of the thesis.

This thesis includes four unpublished papers. It is a study of crying behaviour with a particular focus on the developmental period of adolescence. It was designed to use the cognitive, hormonal and emotional changes occurring in adolescence to examine current crying conceptualizations and provide evidence to base new conceptualizations upon. The ideas, development and writing up of all the papers in the thesis were the principal responsibility of myself, the candidate, working within the School of Psychological Sciences under the supervision of Dr Glenn Melvin, Adjunct Associate Professor Eleonora Gullone and Dr Tom Whelan. The inclusion of co-authors reflects the fact that the work came from active collaboration between researchers and acknowledges input into team-based research.

In the case of chapters 3, 4, 5, and 6 my contribution to the work involved project conceptualisation and design, review of appropriate literature, securing ethics approval, data collection, data analysis and manuscript preparation. My supervisors contributed to the project conceptualisation and design, data analysis and manuscript preparation and

additional statistical advice was sought from Dr John Taffe, Centre for Developmental Psychology & Psychiatry, Monash University.

Thesis chapter	Publication title	Publication status	Journal	Candidate's contribution
3	Crying proneness through a developmental lens: late childhood to adolescence	Submitted	<i>Child Development</i>	As above
4	A Study of Crying Behaviour in Adolescence using a Daily Diary	Submitted	<i>Comprehensive Psychiatry</i>	As above
5	How emotion regulation and social support are associated with adolescent crying	Submitted	<i>Cognition and Emotion</i>	As above
6	A Typology of Adolescent Crying	Submitted	<i>Journal of Adolescence</i>	As above

Sections within submitted chapters have not been renumbered.

Signed:

Date:

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Abstract

The phenomenon of crying is of great interest to the non-scientific community and is implicated in very common and debilitating clinical disorders such as major depressive disorder and dysthymia (Rottenberg, Cevall & Vingerhoets, 2008). Several conceptualizations of crying have been proposed that include considering it a cathartic release of negative emotions (Rottenberg, Bylsma, & Vingerhoets, 2008), a core attachment behaviour (Bell & Ainsworth, 1972; Judith K Nelson, 1998) or a bi-product of cognitive processes (Labott & Martin, 1988; Miceli & Castelfranchi, 2003). In addition to the disparate and sometimes conflicting orientations of these conceptualizations, they each lack sufficient empirical support.

Adolescence is a period of great emotional and cognitive changes and the stage in human life in which individual identity (Cooper, Grotevant & Condon, 1983) and independence begin to be formed. To date, very little research has explored crying behaviour in this developmental period despite such investigations holding great promise for improving understanding of the mechanisms behind crying. The proposed course of research aims to address these gaps by operationalizing and evaluating proposed conceptualizations of crying while providing important data on crying behaviour in adolescence.

The first study examined crying proneness in children and adolescents utilising a sample of 773 females and 623 males aged between 9 and 16 years. The key finding from this study was the significant difference in crying behaviour between children aged 9 or 10 and adolescents aged 11 or older. Of note, a sex difference in crying proneness was only evident in participants aged 11 years and older.

The second, third, and fourth data papers utilised a novel diary of crying behaviour that adolescent males and females completed on a daily basis. The papers

shared a sample of 215 crying episodes collected from 42 adolescents (69% female) aged between 12 and 18. In addition to providing detailed data on frequency and context of crying episodes in an adolescent sample, the diary allowed for an in-depth examination of individual crying episodes. Specifically, this study across three papers provided data on the relationship between emotions and crying, differences between males and females in their crying frequency, the emotional drivers of crying proneness, and the emotions driving adolescents to try not to cry. Using these data, these papers present an empirical evaluation of the role of catharsis and attachment in adolescent crying, and a factor analysis was used to develop a typology of crying.

Taken together, these three papers provide vital information as to how crying develops from infancy, at which point it is primarily a communication strategy to gain caregiver attention, to become the complex and multifaceted behaviour of adulthood. This research demonstrates the utility of the daily diary as a format for gathering information on infrequent, contained events and the difficulty of hindsight bias. The results of the two studies and four papers generate a basis for understanding crying through a developmental lens and provide a starting point for developing empirically based conceptualizations that are targeted at particular types of crying.

Chapter 1: Thesis Introduction

This thesis is a study of crying behaviour with a focus on the developmental period of adolescence. It comprises seven chapters and includes four papers incorporating data gathered from two samples of children and adolescents. This is a ‘thesis by publication’ so there is some unavoidable repetition across the chapters but, where possible, this has been kept to a minimum. This thesis has four aims: 1) to provide a summary of the crying literature with particular reference to developmental period and proposed reasons for crying; 2) to provide descriptions of adolescent crying behaviour, including associations with personal characteristics and common contextual factors; 3) to address the lack of empirical foundation for current conceptualizing on why humans cry; and 4) to inspire further research into crying by providing a more concrete basis for the future exploration of crying across developmental stages. To provide a thematic overview of the research course, the chapters relating to these aims are outlined below.

The first aim of this thesis is to provide a review of the current crying literature outlining its strengths and weaknesses, with a particular emphasis on developmental periods and conceptualizations. Chapter 2 provides a comprehensive and critical assessment of the current state of crying research.

The second aim of the thesis is to investigate the factors associated with adolescent crying. This is addressed in chapter 3 using retrospective survey data concerning the frequency of crying and personal characteristics. This aim is also explored in chapter 4 which presents results from a novel crying diary developed to provide detailed, proximal data on the crying behaviour of adolescent males and females.

The third aim is to address the lack of evidence about the contexts in which adolescents cry. This is approached in two ways. First, by using data collected through application of the crying diary and evaluating empirical support for the current

conceptualizations and second, by providing a foundation of information on which to develop new conceptualizations of crying. Chapter 5 is an empirical evaluation of two major conceptualizations of crying: emotion regulation and social conceptualizations, with reference to the meta-model developed in a review of crying conceptualizations by Vingerhoets and Rottenberg (2000).

Chapter 6 describes the identification of different ‘types’ of crying behaviour that can be used to drive targeted and analytically based theorising on crying in the future. In addition, several conceptualizations of crying which were not considered in chapter 5 are considered with respect to the developed typology.

The fourth and final aim of this thesis is to inspire further research into crying by integrating the original research contributions of this thesis with the established literature. In doing so, a basis for future research into crying behaviour is established. As such, a summary of the contributions of the thesis and a consideration of future directions for research into crying from a developmental perspective and investigation into why humans cry is presented in the general discussion, chapter 7.

At the commencement of the present thesis, the crying literature was scarce and many areas were unexplored. This made designing the research challenging, as theorising on crying remains in its infancy and few methods for systematically assessing crying existed. However, the dearth of data on crying in adolescence also provided extensive scope to explore the fundamental aspects of crying behaviour and the opportunity to contribute significantly to this important research area.

Chapter 2: A Review of Crying, with Particular Reference to Adolescence

2.1. An Introduction to Crying

Despite all baby mammals displaying a ‘separation cry’ which maintains contact with caregivers (Vingerhoets, Rottenberg, Cevaal, & Nelson, 2007), emotional crying is believed to be a uniquely human behaviour (Vingerhoets, Cornelius, Van Heck, & Becht, 2000). It occurs in all life stages and is evident across all cultures (Rottenberg, Bylsma, Wolvin, & Vingerhoets, 2008). Emotional crying has been found to occur in a variety of contexts and in response to a wide range of stimuli. The phenomenon of crying is of great interest to the general population and is also implicated in common and debilitating clinical disorders such as major depressive disorder and dysthymia (Rottenberg, Cevaal, & Vingerhoets, 2008), though the exact relationship of crying with these disorders is not yet clear (Vingerhoets et al., 2007).

2.1.1. Defining crying

In order to discuss emotional crying, it must be distinguished from the physiological shedding of tears, designed to remove irritants such as dust or noxious fumes from affecting the eye, and basal tears, fluid which lubricates the eye and facilitates sight (Rottenberg & Vingerhoets, 2012). As such, for the purpose of this thesis, a definition of crying has been adapted from Patel (1993); crying constitutes a physical response characterised by emotional turbulence accompanied with an increase in tear production and/or vocalisations without any external physical cause such as irritation of the eye. The physical process of crying is primarily driven by the lacrimal gland, pictured in Figure 2.1.

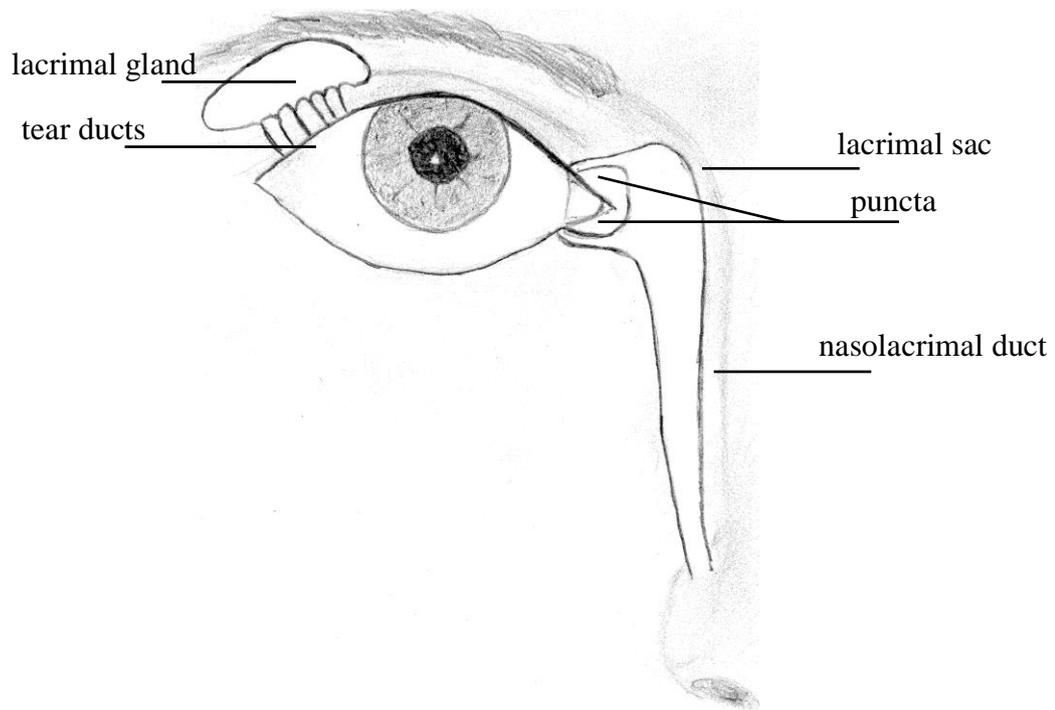


Figure 2.1. Diagram of the lacrimal system showing the tear producing (lacrimal) gland, tear ducts which transport tears to the eye, the puncta which drain excess moisture from the eye, the lacrimal sac into which tears drain and the nasolacrimal duct which vents tears into the nose.

The main lacrimal gland is located between the eyeball and the frontal bone of the skull, but there are numerous other, smaller glands located around each eye. Tears generated in response to physical irritants as well as emotional tears are generated by the main lacrimal gland and released through tear ducts located at the top of the eye (Rottenberg & Vingerhoets, 2012). The smaller glands are responsible for producing the constant flow of tears, or ‘basal tears’, which coat the eyeball and are refreshed by blinking (Rottenberg & Vingerhoets, 2012; van Haeringen, 2001). Normally, fluid that does not evaporate when the eye is open is drained back into the body via the puncta, located at the inner corner of each eye, and into the lacrimal sack before ultimately being drained into the nose. However, when so much fluid is released that it cannot all be drained away, as is the case when a powerful irritant enters the eye or when an individual

exhibits emotional crying, the tears flow over the lower eyelid and down onto the face (van Haeringen, 2001). When this overflow of tears is not driven by a physiological irritant, it is often accompanied by facial expressions, vocalizations and full body movements like sobbing (Patel, 1993). Of note is the experience of excess fluid building up, sometimes referred to as ‘tearing up’, without the fluid overrunning the eyelid and running down the face. This occurs when the volume of tear fluid released is not great enough to overwhelm the draining of the puncta and flows down onto the face. At present, ‘tearing up’ is considered to be lower intensity than shedding tears but is on the spectrum of crying behaviour (Bylsma, Croon, Vingerhoets, & Rottenberg, 2011). In contrast, infant crying involves the same facial expressions, vocalisations and full body movements but is not accompanied by an increase in production of tears (Rottenberg & Vingerhoets, 2012).

2.1.2. Measuring crying

Measuring the spectrum of crying behaviour has predominantly been attempted using two indices, “frequency” and “propensity” (Vingerhoets & Rottenberg, 2000), along with auxiliary spectrums, “intensity” and “length” (Vingerhoets et al., 2000). Frequency refers to the number of crying instances that have occurred while propensity, also known as ‘proneness’, is the likelihood of an individual crying or the threshold intensity that a stimulus must exceed to induce crying (Denckla, Fiori, & Vingerhoets, 2014). While the two constructs, frequency and propensity, are related, the distinction between them is important. For example, an individual may have a low propensity to cry but have been exposed to a variety of emotionally potent situations and events and thus have a high recorded frequency of crying. Conversely, an individual may have a very high propensity to cry but report a low frequency of crying episodes because they avoid cry-inducing situations in their everyday life. Furthermore, the impact and meaning behind an instance

of crying in an individual who has a very high propensity to cry may be different to the importance and implications for someone who has a very low proneness to cry (Vingerhoets & Rottenberg, 2000).

To measure an individual's propensity to cry and the frequency at which they have cried, researchers have predominantly employed retrospective questionnaires (Vingerhoets et al., 2007). The main benefit of the survey method is that it is readily possible to obtain large sample sizes. The main disadvantages are that it provides coarse evidence and is strongly influenced by hindsight bias. A Crying Proneness Scale has recently been developed which provides a method for collecting more detailed data using a single survey. This method accounts for hindsight bias by asking questions about the present such as: "How likely is it that you are touched to tears when you see/read/hear the following events while you read a book or see a documentary/movie?" (Denckla et al., 2014, p. 631). Even so, some studies have used a diary to record specific instances of crying (Bylsma et al., 2011) and there are several advantages to using a diary of crying behaviour.

Essentially a crying diary comprises questionnaires which are answered daily, rather than requiring reflection over a longer period. Of particular importance, the use of a crying diary limits the effect of hindsight bias as it relates to the number of times an individual has cried over a briefer period. It is expected that participants may forget crying episodes that occurred a longer time ago and place more emphasis on recent crying episodes when responding to a retrospective survey which considers time periods of weeks or months (Bylsma et al., 2011). Additionally, it is possible to gain a greater depth of knowledge about each individual crying episode and a greater wealth of qualitative information about the antecedents and consequences of a given episode of crying when

using a diary as compared with a retrospective questionnaire or with the Crying Proneness Scale (Denckla et al., 2014).

2.2 A Developmental Perspective on Crying Behaviour

Crying is a behaviour that occurs throughout the lifespan and yet has only received significant scientific attention in two broad developmental periods: infancy and adulthood. Very little is currently known about how crying changes from infancy, at which time it is believed to primarily be used to communicate to caregivers (Barr, Hopkins, & Green, 2000; Nelson, 2005), to become the complex and multifaceted behaviour of adulthood. Further study regarding the prevalence and purpose of crying at different ages is needed in order to create a complete picture of crying behaviour.

In particular, adolescence is a period of great hormonal, emotional and cognitive development where individual identity and independence begin to be formed (Rice, 1990). However, very little research has explored crying behaviour in this developmental period. Given the reported differences in the purpose, complexity and triggers of crying behaviour between infancy and adulthood as described below, adolescence must be an important period of crying behaviour development.

Following is a brief review of the current literature on crying behaviour in infancy, childhood, adolescence, adulthood and older adulthood and a discussion of some currently unanswered questions. For the purpose of the following review, infancy will be considered to begin at birth, childhood at 1 year of age (Bell & Ainsworth, 1972), adolescence at 11, adulthood at 18 and older adulthood at 65 years (Gurland, 1976; Tsai, Levenson, & Carstensen, 2000).

2.2.1 Infancy

Basal tears are present in humans even before birth but the shedding of tears does not begin until the first reflex tears (sometime from a few days until a few weeks after birth);

tears from emotional crying are not seen until 3 or 4 months after birth (Rottenberg & Vingerhoets, 2012). The ability of an infant to cry is important, even necessary, for survival although it also sometimes endangers an infant by engendering abuse (Barr et al., 2000; Oldbury & Adams, 2015; Soltis, 2004; Zeifman, 2001a, 2001b).

Crying is by far most prevalent in infancy, where infants cry as their primary means of communication. Over the first year of an infant's life, they cry approximately four times an hour but, during the course of their first year, the duration of these crying episodes decreases (Bell & Ainsworth, 1972; Van Ijzendoorn & Hubbard, 2010). Kopp (1992) found that the number of crying episodes then peaks between 15 and 24 months before dropping off again towards 30 months. Unfortunately, no information on the time period over which crying episodes were counted was presented so a comparable measure of frequency was not able to be derived. Other sources suggest that infant crying is reliably at its highest level at 6 weeks (Zeifman, 2001a, 2001b). The similarity in crying frequencies of infants regardless of their location or situation could be interpreted as evidence that there is an ubiquitous internal cause of crying in early infancy (Zeifman, 2001a, 2001b).

Infants use crying to gain the attention and assistance of caregivers when they require basic needs to be met, such as sustenance and hygiene, as well as to gain assistance when a goal drive is frustrated (Barr et al., 2000; Soltis, 2004; Zeifman, 2001a). An infant who could not cry would be unable to wake their parent to indicate feeding is necessary during the night or that they have compromised hygiene, endangering their health. As an infant grows, its ability to communicate in other ways develops (Bell & Ainsworth, 1972).

Bell and Ainsworth (1972) studied the frequency and length of infant crying in the context of the mother-infant relationship by observing the mother-infant interaction of 26 families in the familial home. In a recent replication of this study, Van Ijzendoorn and

Hubbard (2010) investigated 50 families. They recorded the number of times an infant cried and for how long, as well as how often the mother ignored infant crying, how quickly she responded to infant crying, and the infant's response. Both studies found that crying frequency remained the same across the first year but that the duration of each crying episode was substantially reduced by the end of the first year of life. Bell and Ainsworth (1972) reported that the duration of crying decreased from 7.7 minutes to 4.4 minutes and Van Ijzendoorn and Hubbard (2010) found that it decreased from 6.6 minutes to 3 minutes, remarkably consistent results. This same pattern has also been found to be evident across both western and non-western cultures (St James-Roberts, Bowyer, Varghese, & Sawdon, 1994).

With all infants, Bell and Ainsworth (1972) found that crying in the first three months was most likely to occur when the infant had no proximity to their mother while it occurred most often between 9 and 12 months when the infant had proximity to their mother but no contact with her. Taken with the most effective response to infant crying, physical contact, it appears that, initially, infants cry when they are alone in order to gain the attention of anyone nearby that can help with their needs. By the end of the first year, however, it appears that infant crying may be more nuanced and more likely to be directed specifically towards the mother (Bell & Ainsworth, 1972).

The speed and frequency of parental responsiveness to infant crying has been found to be a predictor of subsequent infant crying though there is dispute about the directionality of this relationship. Bell and Ainsworth (1972) found that more reliable parental responses resulted in reduced crying frequency in subsequent months, but in the Van Ijzendoorn and Hubbard (2010) replication they found the opposite result. Similarly, there is dispute regarding the role of temperament in infant crying with Bell and Ainsworth (1972) indicating that it did not influence crying behaviour substantially and Van

Ijzendoorn and Hubbard (2010) finding that individuals differed in their crying behaviour and that these differences were relatively stable. The differences between these two studies may be due to the larger sample size used by Van Ijzendoorn and Hubbard (2010) and their more advanced data collection techniques. Interestingly, Van Ijzendoorn and Hubbard (2010) also found that levels of maternal responsiveness differed substantially within the sample indicating that temperament or personality may influence both parent and infant attachment behaviour. This is further substantiated by a recent study which found that young people who were insecurely attached to their parents responded differently to infant crying than those who were securely attached (Schoenmaker et al., 2015). Regardless of the exact nature of these relationships, it is evident that both infant temperament and parental responsiveness are important concerns when trying to understand infant crying.

Parents adopt wide ranging responses to their infants. Some parents are over-facilitative of infants, some are unresponsive, and others are aggressive towards their child. In his consideration of colicky crying, Barr (2006) proposed that the way parents respond to this type of crying can have a significant impact upon a child's development. In particular, Barr (2006) has highlighted the dangers of parental stress related to hyper-frequent crying (colic), as stress can lead some parents to try to physically stop the baby from crying which can lead to shaken baby syndrome. Nonetheless, crying predominantly evokes a caring, nurturing response from parents. Indeed, crying has been considered by several authors, including the early proponents of attachment theory, John Bowlby (1969) and Mary Ainsworth (1972), to be one in the key repertoire of behaviours that facilitates attachment between child and mother (Nelson, 2005; Zeifman, 2001b).

Soltis (2004), however, has argued that the parental relationship may provide a different function for infant crying than identified by the attachment theorists. He argued

that the signalling function suggested by Bell and Ainsworth (1972) only represents the theoretical situation in which a mother and her child have exactly the same goal: to meet the needs of the infant through the investment of the mother's resources. This is not always the case, as the infant and mother sometimes have different survival interests. For example, when a mother has two children, she may attempt to maximise the survival of her genetic offspring by splitting her resources equally between each child, while each child will aim to maximise their own genetic survival by gaining a larger than equal share of the mother's resources. As such, when an infant and mother have differing interests, the infant's behaviour may be used to influence the caregiver to pursue the infant's needs (Soltis, 2004).

The notion of manipulative communication proposed by Soltis (2004) may be useful in understanding colic. Colic is often defined using Wessel's rule which states that colic can be diagnosed when an infant's crying exceeds the rule of three, that is, when an infant has cried for more than 3 hours a day for more than 3 days in a week despite being physically healthy and well-fed (Barr, Rotman, Yaremko, Leduc, & Emmet-Francoeur, 1992; Soltis, 2004; Wessel, Cobb, Jackson, Harris, & Detwiler, 1954). The majority of research into infant crying relates to colic (Asnes & Mones, 1982; Garrison & Christakis, 2000; Lucassen et al., 1998, 2001; Taubman, 1984, 1988) and despite this long term investigation, there is ongoing discussion about whether colic is a condition warranting treatment or the extreme end of natural infant development (Garrison & Christakis, 2000). In summarising recent literature on colic and, more broadly, high levels of inconsolable crying, Barr (2006) stated that the last 30 years of research into infant crying behaviour indicated that in 95% of cases, this behaviour is not indicative of a disorder in the child. Similarly, Soltis (2004) argued that colic really just represents the upper bound of the normal crying spectrum. Soltis (2004) noted that excessive, inconsolable crying, often

called colic, has acoustic properties that indicate it can be understood both as a genuine signal of vigour and as a false signal designed to manipulate. In the longer term, it has been found that infants who initially cry most often and for the longest periods will tend towards the same average at one year of age as those who cried less frequently in the initial stages of infancy (Bell & Ainsworth, 1972).

The final area of note in infant crying concerns the possible sex difference in crying among infants. Though it has long been reported that male infants cry more frequently than female infants (Landreth, 1941), it has been suggested that this may be due to the greater activity levels of male infants that expose them more often to cry-inducing stimuli (Campbell & Eaton, 1999). In this way, male infants may have the same or even a lower crying propensity than female infants despite crying more often. Support for this notion has come from a study which found that female infants may have a greater propensity to cry than males as evidenced by their tendency to cry more quickly when having their arms restrained (Camras et al., 1998). Complicating matters further, some studies have found no difference in crying frequency between male and female infants (e.g., Van Ijzendoorn & Hubbard, 2010).

2.2.2 Childhood

Unlike infancy, crying has been little studied in childhood. Studies suggest that crying is greatly impacted by the cognitive development that occurs rapidly in the early years of life, but the exact timing or mechanism of such development is poorly understood. In particular, language development seems to have a substantial impact on the frequency, purpose and meaning of crying (Kopp, 1992), but the particular aspects of language development that have the greatest impact and the reasons why remain largely speculative.

The importance of crying as a form of communication certainly changes at the advent of language development (Kopp, 1992). Between the ages of 15 and 24 months there is a

peak in crying behaviour which corresponds to the difficult developmental stage characterised by irritability and sometimes referred to as the ‘terrible twos’ (Kopp, 1992). Children begin to acquire language at around this time and it is suggested that frustration around an inability to communicate effectively may increase the incidence of frustrated crying. This peak may represent a period where the cognitive development of the child outstrips their development of language, thwarting attempts at communication and frustrating the child (Kopp, 1992).

Aside from in studies of language acquisition, there are no published data on developmental transitions in crying behaviour into childhood. Whether and when humans begin to cry in response to positive events, cry for aesthetic reasons (such as when listening to especially moving music), or cry for deliberately manipulative reasons remains unclear. However, we attribute the capacity for each of these to adults and not to infants. There has been a small amount of research conducted into the reasons that children cry and how this might differ between the sexes.

Though it is established that adult crying behaviour differs between the sexes (Lombardo, Cretser, & Roesch, 2002; Peter, Vingerhoets, & Van Heck, 2001), if sex differences do exist in the way that pre-adolescents cry, they are much more subtle (Camras et al., 1998; Landreth, 1941). Initially, it was posited that the sex difference did not begin until adolescence (Frey & Langseth, 1985) but a more recent study by Jellesma and Vingerhoets (2012) has found that a sex difference in crying may be established in children as young as 9 years old. Indeed, despite a substantial floor effect in their data, gathered from 186 9-13 year olds, a significant sex effect emerged with girls crying once every 7.4 days and boys cried once every 9.6 days. Another study investigated the crying frequency of children between the ages of 11 and 16 and found that girls cry approximately once every 7 days and boys once every 14 days (Van Tilburg, Unterberg,

& Vingerhoets, 2002). According to Jellesma and Vingerhoets (2012), the explanations for this early difference were parental socialisation, a difference in sexed peer pressure and differing experience of the strength of internalising emotions. Unfortunately, the study design meant that it was not possible to discount any of these hypotheses. Furthermore, there are indications of an earlier sex difference.

Research by Zeman and Shipman (1996) provides a clue about possible sex differences in children under the age of 9 years. Zeman and Shipman (1996) presented children with stories in which they were told how the protagonist was feeling and asked how they would express those feelings, to whom and why. Children reported that they expected to receive a positive interpersonal reaction when they expressed sadness. They reported that they expressed sadness by passively behaving in a way that communicates sadness as well as actively, such as by crying. Zeman and Shipman (1996) noted that younger children reported crying more commonly than older children. Children also reported that they would cry in scenarios where they experienced physical pain. This study did not explicitly investigate sex differences in crying behaviour but did note that girls were more comfortable expressing their feelings than boys, indicating a possible sex difference in crying behaviour. Despite these insights into the crying behaviour of children, it remains a critically understudied developmental phase, as is also the case for adolescence.

2.2.3 Adolescence

Adolescence is an emotionally tumultuous period that links the dependent behaviour of childhood with the independence of adulthood (Hare et al., 2008; Yurgelun-Todd, 2007). Given the proposed role of strong emotions in crying (Miceli & Castelfranchi, 2003; Vingerhoets & Rottenberg, 2000), it seems that this developmental period may be particularly valuable for understanding crying behaviour and how factors such as

emotional experience impact upon the incidence of crying. Further, it may provide insight into when and why the expressions of crying in childhood (Nash, Morris, & Goodman, 2008) gain the greater complexity found in adulthood (Becht & Vingerhoets, 2002; Peter et al., 2001; Rottenberg, Bylsma, Wolvin, et al., 2008; Rottenberg, Cevaal, et al., 2008). Despite this, adolescence has been among the least studied developmental periods in relation to crying (Van Tilburg et al., 2002).

It has long been believed that sex differences in crying are the result of menarche (Frey & Langseth, 1985; Jellesma & Vingerhoets, 2012). In order to investigate this, Van Tilburg et al. (2002) examined the role of the onset of menarche during adolescence as well as an alternative hypothesis about the influence of empathy on crying behaviour. The sample consisted of 11-16 year old Dutch students who completed the Questionnaire Measure of Emotional Empathy (Mehrabian & Epstein, 1972) and a shortened version of the Adult Crying Inventory (ACI) adapted for adolescents (Van Tilburg et al., 2002). In addition, participants were asked about personal characteristics and, if female, their age of first menstruation. It was found that increases in empathy were more pronounced in females as they aged through the adolescent period and crying behaviour also increased in frequency throughout this period disproportionately compared with boys. There was, however, no effect of the onset of menarche on any index of crying, suggesting that the long held belief that women cry more than men due to hormonal changes during their menstrual cycle is, at least, not the sole determinant of a sex difference in crying.

A more recent study on crying using a sample of adolescents was conducted by Ardana, Whelan, and Melvin (unpublished manuscript) into the relationship between crying behaviour and emotion regulation with an Australian sample. Participants aged between 11 and 18 years completed the short form of the ACI adapted for adolescents by the researchers (Ardana et al., unpublished manuscript), the Reynolds Adolescent

Depression Scale-2 (Reynolds, 2002) and the Emotion Regulation Questionnaire (Gross & John, 2003). Results indicated that, in this sample, sex differences were relatively established and that both depressive symptomatology and use of suppression as an emotion regulator were associated with higher crying frequency. In addition, use of cognitive reappraisal as an emotion regulation strategy was found to be related to an increase in mood improvement, or ‘catharsis’, after crying.

At present, emotions such as anxiety, anger, guilt and positive affect, as well as a variety of personal variables, such as personality, style of parenting experienced and self-esteem, are yet to be considered in relation to adolescent crying behaviour. Considering that some of these constructs have been implicated in child or adult crying (Vingerhoets & Rottenberg, 2000), they may be important in determining how crying develops during adolescence and why the gap between females and males in crying frequency and proneness is thought to widen during this developmental period. Along with emotions and personality, many other factors have been linked to crying in adulthood.

2.2.4 Adulthood

Aside from the colicky crying of infants, the majority of the investigation undertaken into crying to date has been conducted using an adult population. However, given that there has been little research into adult crying that has taken a developmental perspective, it is difficult to present a complete analysis of crying in this distinct period of development. Most adult studies to date have grouped participants over the age of 18 years into the category of “adults” rather than the more granular categories of “young adulthood”, “middle age” and “old age” or a continuous scale of age. As such, it is not possible to determine when developmental differences in adult crying behaviour emerge.

Following is a summary of some of the factors that have been established in relation to adult crying.

Studies utilising a mixed sex sample have found a difference in crying behaviour between males and females which is consistent across cultures with females crying more frequently and intensely than men (Becht & Vingerhoets, 2002; Lombardo et al., 2002; Peter et al., 2001). Of interest, one study found that differences in crying propensity between the sexes were more pronounced in wealthy, democratic societies where women have more rights (van Hemert, van de Vijver, & Vingerhoets, 2011).

Few studies report the frequency of crying observed in their participants. One study using a nonclinical sample of adult women showed an average crying frequency of once every 5.4 days (Bylsma et al., 2011). This is further evidence that young females cry substantially more often than males and that the gender difference is present throughout adulthood. Even so, Hastrup, Kraemer, Bornstein, and Trezza (2001) found that certain males, such as male psychology practitioners, cry more often than the average man - closing the gender difference gap. Additionally, a study focusing on a sample of clinically depressed participants found that males had a higher average crying frequency, with males once every 5.7 days and females once every 4.3 days (Rottenberg, Cevaal, et al., 2008).

The typical male and female difference is attributed to sexed expectations where crying is considered less acceptable in men than in women (Lombardo et al., 2002). Aside from crying more than men, women are more likely to regard crying as a coping strategy than men (De Fruyt, 1997). Similarly, people who score more highly on the neurotic personality subscale of the NEO Personality Inventory are more likely to view crying as a legitimate coping strategy (De Fruyt, 1997) and to cry more frequently (De Fruyt, 1997; Rottenberg, Bylsma, Wolvin, et al., 2008). People who are more empathic or anxious also

tend to cry more frequently (Rottenberg, Bylsma, Wolvin, et al., 2008). It is thought that some of these personality variables may also influence how crying influences mood.

It is estimated that one third of all adult crying episodes result in positive mood change, or 'catharsis' (Bylsma et al., 2011), but the reasons that crying episodes may be more or less cathartic are poorly understood and may relate to personality, the presence of disordered mood and social context (Becht & Vingerhoets, 2002; Bylsma et al., 2011; De Fruyt, 1997). Studies which only consider a female sample have found that 'urge to cry' and 'crying frequency' are positively correlated with poor mood such that unhappy people are more likely to feel more like crying and actually cry more often. Interestingly, urge to cry, analogous to crying propensity, is also associated with variability in mood such that people are more likely to cry if their mood is fluctuating (Bylsma et al., 2011; Peter et al., 2001). These observations are restricted to crying that follows negative antecedents and there is anecdotal and quantitative evidence that similar factors may be associated with crying after positive events (Rottenberg, Bylsma, Wolvin, et al., 2008). Findings indicate that people are more likely to cry for positive reasons if they have a secure attachment style (Laan, van Assen, & Vingerhoets, 2012) and if they are extraverted and empathic (Rottenberg, Bylsma, Wolvin, et al., 2008).

Tears of joy are a well-known but poorly understood phenomenon. Feldman (1956) believes that they are caused by sorrow which is triggered by comparing a current, positive situation with traumatic events in the past. In contrast, Efran and Spangler (1979) regard tears of joy as representing a recovery phase following a period of excitement or anticipation such that tears are released when the tension in a situation is released. Conversely again, Miceli and Castelfranchi (2003) view all crying to be caused by perceived helplessness. They propose that people only seem to cry at happy events where there has been some kind of tension or obstruction to their achieving their goal which has

been overcome. They view joyful crying as a result of reviewing their past helplessness in overcoming the obstruction and as a vent for these negative feelings.

Adult crying can also be seen as attachment behaviour as it pertains to communicating distress to others and has been found to facilitate social bonding (Hendriks, Croon, & Vingerhoets, 2008). Attachment theory is described in more detail below (section 2.3.6) but the sections which relate specifically to adults are also outlined here. Evidence shows that adults feel more sympathetic and are more likely to give assistance to people who are crying than to those who are not crying (Hendriks, Croon, et al., 2008), indicating that crying may be a means of obtaining assistance. This is consistent with the predominant hypothesis for infant crying, which sees infant crying behaviour as a way for the infant to notify the carer that she or he needs something (Soltis, 2004).

Adults often expect to be seen as manipulative when crying, yet there is no evidence that others perceive people as manipulative when they are crying (Hendriks, Croon, et al., 2008). There are anecdotal accounts of crying being used manipulatively (Bylsma, Vingerhoets, & Rottenberg, 2008; Peter et al., 2001) but no quantifiable evidence.

The crying-response behaviour established in infancy (Nelson, 1998) is thought to influence behaviour in other relationships throughout life. As would be expected by this theory, early attachment relationships have also been found to impact on adult crying (Laan et al., 2012; Maas, Laan, & Vingerhoets, 2011). People with an avoidant attachment style tend to cry less frequently and those with a preoccupied style cry more intensely than those adults with a secure attachment style. Additionally, adults with preoccupied and fearful attachment styles have been found to experience more negative affect while crying. Furthermore, insecurely attached individuals respond differently to infants' attachment cries (Schoenmaker et al., 2015). These findings again point to the

importance of viewing crying through a developmental lens; the experiences of early life continue to have significant impact on adult crying.

2.2.5 Older Adulthood

Like adolescence and childhood, this developmental period has received very little attention to date, though older adults are sometimes included in 'adult' samples for crying research. Unlike research in adulthood, a study by Hastrup, Baker, Kraemer, and Bornstein (1986) found no significant sex difference in crying frequency between men and women. Hastrup et al. (1986) proposed that this may be due to hormonal changes or reductions in the social stigma associated with male crying in older adults. However, the crying frequencies reported in this study for younger adults were consistently lower than those found in other studies, with males crying once every 66.4 days and females crying once every 12 days. This discrepancy may be due to methodological issues such as the inclusion of crying for physiological reasons or an effect of having a small, sex biased sample ($N_{\text{male}}=20$, $N_{\text{female}}=44$). In contrast, Tsai et al. (2000) found that crying frequency remains unchanged across younger and older adulthood.

2.2.6 Summary

Nonetheless, there are currently large gaps in the literature on crying across the lifespan. In the infant literature, crying and the consequent parental response are conceptualised as attachment behaviour which forms the foundation of future relational styles (Nelson, 1998, 2005a). Two studies in infancy have found that the frequency of parental responsiveness is related to the quantity of infant crying with each finding conflicting results, indicating that more research is required to fully understand the nature of this relationship (Bell & Ainsworth, 1972; Van Ijzendoorn & Hubbard, 2010). There is evidence that the attachment style gained through these early interactions influences

crying behaviour later in life (Maas et al., 2011; Schoenmaker et al., 2015). Additionally, it seems that crying may function as an attachment behaviour in adulthood when in social circumstances, with the purpose of crying being to ‘attach’ and gain assistance from peers rather than traditional attachment figures (Hendriks, Croon, et al., 2008; Hendriks, Nelson, Cornelius, & Vingerhoets, 2008). To date, there is a lack of literature about how the attachment function of crying develops in the intervening life periods of childhood and adolescence.

Similarly, manipulative motives have been attributed to crying behaviour in infancy (Soltis, 2004), childhood (Kopp, 1992; Rottenberg & Vingerhoets, 2012) and adulthood (De Fruyt, 1997; Hendriks, Nelson, et al., 2008; Vingerhoets & Rottenberg, 2000) though no studies have considered it in the crying behaviour of adolescents. Additionally, papers that consider manipulative crying in childhood and infancy are mostly observational or theoretical in nature. Research has found that people are more likely to behave sympathetically and helpfully towards crying individuals (Hendriks, Croon, et al., 2008), indicating that crying could effectively influence the behaviour of others. More study into the manipulative purposes of crying throughout the lifespan may shed light on the difference in frequency of crying throughout the lifespan as well as adding to understanding about the function of crying.

These gaps prohibit a complete conceptualization of crying as a developmentally changing process. There is a dearth of studies that focus on childhood, adolescence and older adulthood and much of the current thinking on what crying means in infancy and adulthood relies on speculation about these other developmental periods. Given the proposed similarities between infant and adult crying discussed above, and the developmental differences occurring throughout the lifespan, it is important that these

gaps be addressed. This will allow a more coherent literature to develop and help to further understanding of crying across all stages of life.

2.3. Why do Humans shed Emotional Tears?

Early views of crying, such as those proposed by Darwin (1872), attempted to explain emotional crying as part of a purely physiological process, an unneeded by-product of developing a system of removing irritants from the ocular structures. Darwin's (1872) conceptualization of crying was predicated on the observed contractions of the muscles around the eyes in children who are crying. He interpreted this as the result of screaming to get the attention of parents which led to more blood around the eyes and subsequently those muscle contractions causing tears to be released. However, more recent research into the emotional and cognitive mechanisms involved in crying behaviour along with evolutionary conceptualizations of crying indicate that Darwin's reductionist conceptualization poorly accounts for the multifaceted nature of crying.

Since Darwin, many alternate conceptualizations have been proposed. Generally, conceptualizations of crying are predicated on the link between shedding emotional tears and the emotional experience that precedes them. As such, there is a question of whether emotions themselves are the driving force underlying crying behaviour. However, to date, many of these conceptualizations contradict each other, none are adequately empirically tested and there remains substantial conjecture as to the extent of their respective explanatory power (Kottler & Montgomery, 2001; Vingerhoets & Rottenberg, 2000). Vingerhoets, et al. (2000) reviewed theories and conceptualizations of crying. A major outcome of this review was the recognition of the extensive discussion as to why people cry as compared with the dearth of scientific studies aimed at testing which of these theories and conceptualizations, if any, help to explain crying behaviour. The review by Vingerhoets, et al. (2000) highlighted the similarities between previous

conceptualizations of crying behaviour by grouping them under several themes, including psychoanalytic, evolutionary and physiological. The present review of the crying literature will explore similar themes as Vingerhoets et al. (2000) and will focus primarily on conceptualizations that have been empirically examined. It will also consider how these conceptualizations of crying behaviour are seen from a developmental perspective.

2.3.1 Crying, Sadness, and Depression

Mood is strongly linked to crying both in the scientific literature (Vingerhoets et al., 2007) and in the wider community's understanding of crying (Stougie, Vingerhoets, & Cornelius, 2004). Individuals have reported crying while experiencing a variety of emotions including sadness, fear, anger, happiness, disappointment and relief. However, crying is most strongly and consistently linked with sadness. Crying has long been considered symptomatic of major depressive disorder (Beck, Ward, Mendelson, & Mock, 1961) and crying has been considered a sign of the dysfunctional coping associated with the disorder (Nelson, 2000).

The relationship between crying and depressive illness has received a great deal of attention in the literature (Hastrup et al., 1986; Patel, 1993; Rottenberg, Cevaal, et al., 2008; Vingerhoets et al., 2007). However, there is yet to be agreement on the exact nature of this relationship, with two proposals under consideration. The first proposed relationship is based on many studies of adult crying behaviour that indicate that, as depressive symptomatology increases, crying frequency and propensity increases (Vingerhoets et al., 2007). Furthermore, individuals suffering from depressive symptomatology have been found to cry more often, to have a higher propensity to cry in response to negative stimuli, and to experience a lowered mood after crying when compared with non-clinical controls (Rottenberg, Gross, Wilhelm, Najmi, & Gotlib, 2002). These studies indicate that depression and crying are linearly linked. However, the

linear relationship between depressive symptomatology and crying is disputed (Patel, 1993; Rottenberg et al., 2002). These studies have employed either clinical or non-clinical populations and have thus not explored in great detail the differences in crying behaviour between the individuals with non-clinical and clinical depression.

The alternative relationship proposed is of an inverted J-shaped relationship, wherein crying frequency and proneness increase as depressive symptomatology increases until the depressive feelings reach a high degree of intensity, at which point the individual largely stops crying (Patel, 1993; Rottenberg et al., 2002). This proposed relationship is predicated on the finding that some highly depressed individuals cry very rarely (Patel, 1993), with reports that some individuals suffering from depression feel that they are unable to cry. In some studies, the relationship has only been significant for one sex (Frey & Langseth, 1985; Hastrup et al., 1986) while in others, the relationship has not been reproduced at all (Labott & Martin, 1988).

Of interest to considering the relationship between depressive symptomatology and crying behaviour is the adolescent period of development during which a sex difference is believed to develop between males and females for both of these constructs. There is a significant difference in the number of adult men and women suffering from depression (Nolen-Hoeksema, 2001; Piccinelli & Wilkinson, 2012), yet this difference does not exist in childhood (Nolen-Hoeksema & Girgus, 1994). Research suggests that this sex difference becomes apparent during early adolescence and is established at adult levels by young adulthood (Hankin et al., 1998; Nolen-Hoeksema & Girgus, 1994). Similarly with regard to crying, a sex difference is apparent in adults (De Fruyt, 1997; Peter et al., 2001), with women crying more frequently than men, but not in early childhood (Vingerhoets & Scheirs, 2000). There is some evidence that this sex difference in crying exists by the age of 13 (Jellesma & Vingerhoets, 2012) but the difference is not as pronounced as in adults,

suggesting that it develops further during adolescence. Due to the close relationship between crying and affective disorders, the emotion regulation function of adolescent crying is of particular interest.

2.3.2 Crying as an Emotion Regulation Strategy

One way of understanding the relationship between crying and emotion is to see crying as a form of emotion regulation. Emotion regulation is a construct that encompasses how well individuals are able to influence their emotional state as well as the strategies by which they enact this influence (Gross & John, 2003; Gross, 1998b). Thompson (1994) has defined emotion regulation as “extrinsic and intrinsic processes responsible for monitoring, evaluating, and modifying emotional reactions, especially their temporal and intensive features, to accomplish one’s goals” (p. 27-28). This definition draws attention to the core aspects of emotion regulation: it can be explicit, actively engaged in, or implicit, unconsciously implemented, and may refer to any strategy which changes the way emotions are experienced or expressed.

A recent study examined how people explicitly up- or down-regulate crying to moderate their contextual or emotional situation. Reasons for down-regulating crying included avoiding or diminishing negative emotion and avoiding social reactions, such as pity, that engender negative feelings. Reasons for up-regulating crying included venting feelings and attracting positive social reactions, as described in section 2.3.5 (Simons, Bruder, van der Löwe, & Parkinson, 2013).

Several emotion regulation strategies have been proposed to date including social support, rumination, problem-solving, and acceptance (Nolen-Hoeksema & Aldao, 2011). However, two strategies have received the vast majority of scientific attention: suppression and reappraisal (Gross & John, 2003). Gross (1998) proposed a theory of emotion regulation whereby the regulation strategies can be categorised based on the

stage of the emotion generation process at which they are implemented. Broadly, emotion regulation strategies are either antecedent-focussed, employed before the emotional response is complete, or response-focussed, employed after the emotional response is complete. Emotional suppression is a response-focussed strategy that is aimed at reducing the expression of emotion felt (Gross, 1998a), as is crying if it is used to achieve catharsis, as discussed in section 2.3.3 (Simons et al., 2013). Conversely, reappraisal is an antecedent-focussed strategy by which an individual attempts to understand a stimulus in a way that reduces the emotional impact (Gross, 1998a), as crying could be if it is employed to gain social support (Simons et al., 2013).

Both reappraisal and suppression are considered explicit emotion regulation strategies, actively engaged in by an individual experiencing an unwanted emotion (Gyurak, Gross, & Etkin, 2011). This is also true of crying to obtain social support. Recently, there has been a greater scientific interest in implicit emotion regulation, those strategies which are implemented without conscious thought (Gyurak et al., 2011). There has long been conjecture regarding the emotional experience of crying, culminating in a recent increase in empirical studies (Becht & Vingerhoets, 2002; Bylsma et al., 2011, 2008). In this context, the importance of crying as an implicit emotion regulation strategy must be considered. Therefore, understanding the principles of emotion regulation may be an important conceptual element in the explanation of crying behaviour. Studies investigating this have found that individuals who implement maladaptive regulation strategies such as suppression are more likely to feel overwhelmed by their emotions (Maas et al., 2011) which can lead to crying (Feldman, 1956; Jellesma & Vingerhoets, 2012; Wood & Wood, 1984). Additionally, crying may serve directly as an implicit emotion regulating strategy and lead, as many have posited, to a cathartic release of

negative emotion (Becht & Vingerhoets, 2002; Bylsma et al., 2011, 2008). To this end, emotion regulation provides a studied framework in which to consider catharsis.

2.3.3 Crying and Catharsis

Several authors have posited that crying can release pent up emotions and result in improved mood, indicating crying may serve the purpose of catharsis (Gračanin, Bylsma, & Vingerhoets, 2014; Stougie et al., 2004; Vingerhoets, 2013). This relationship is typified by the phrase “to have a good cry”. The effect of crying on mood has received attention in the literature (Becht & Vingerhoets, 2002; Bylsma et al., 2011; Hendriks, Nelson, et al., 2008), yet there remains substantial disagreement on the relationship between crying and subsequent mood. Understanding this relationship is of central importance to understanding some of the underlying reasons why humans cry.

Typically, studies that ask about mood change after an episode of crying have used retrospective questionnaires. These investigations found that people predominantly report positive mood change (Becht & Vingerhoets, 2002; Bylsma et al., 2011, 2008) although some studies report their mood remains unchanged and there is a small group who report negative mood change after crying (Lombardo et al., 2002). New evidence suggests that crying may make some people feel worse in the short term but result in an improvement of mood over a longer period (Gračanin et al., 2015). To further complicate the picture, studies that induce crying in participants have predominantly found that crying results in lowered mood (Labott & Martin, 1988; Martin & Labott, 1991).

Due to the retrospective nature of questionnaire studies, and the fact that they generally ask participants about their crying behaviour rather than specific instances of crying, the exact contextual or personal factors that impact on mood change after crying have not been determined. However, an international study on mood change after crying found that receiving social support, gaining a personal insight or external resolution

appear related to mood improvement after crying while guilt, shame or crying for empathic reasons seem related to mood deterioration (Bylmsa et al., 2011).

The cathartic properties of crying have long been alluded to (Efran & Spangler, 1979; Wood & Wood, 1984), but only explicitly studied more recently (Bylmsa et al., 2008; Rottenberg, Bylmsa, & Vingerhoets, 2008). A number of mechanisms have been proposed to explain the cathartic effect of crying including releasing psychic stress, opioid release, blood clearance and detoxification, self-image improvement and sobbing rhythmically to provide soothing stereotypic properties (Gračanin et al., 2014). However, there is currently insufficient evidence to accept or refute any of these hypotheses. It is estimated that one third of all crying episodes result in positive mood or catharsis (Bylmsa et al., 2011) but the reasons that crying episodes may be more or less cathartic are poorly understood. There is equivocal evidence that certain personality traits (De Fruyt, 1997; Rottenberg, Bylmsa, Wolvin, et al., 2008) and situational factors (Bylmsa et al., 2011, 2008; Rottenberg, Bylmsa, Wolvin, et al., 2008) as well as the use of emotion regulation strategies (Ardana et al., unpublished manuscript) alter the likelihood of experiencing catharsis. Rottenberg et al. (2008) found no significant relationship between personality variables and feelings after crying while De Fruyt's (1997) results showed that extraverted people and those with higher excitement seeking and lower depression scores were more likely to feel better after crying. Dutifulness, which is characterised by strict adherence to social and moral rules, was significantly correlated with worsened mood after crying (De Fruyt, 1997).

Several clinical factors have been found to influence the probability of experiencing catharsis after crying. Alexithymia, anhedonia, anxiety and depression have all been shown to decrease the probability of experiencing catharsis after crying (Rottenberg, Bylmsa, Wolvin, et al., 2008). Feelings after a crying episode depend on cultural norms

surrounding crying and the shame associated with it. Studies have shown that people from cultures which discourage outward displays of emotion, who are ashamed of crying, or try to suppress crying are less likely to experience catharsis after crying (Becht & Vingerhoets, 2002; Bylsma et al., 2011). The likelihood of experiencing catharsis also appears to be context dependent, with greater potential for cathartic crying to be associated with receiving social support (Bylsma et al., 2011), coming to a new understanding of the antecedent to the crying and resolving the antecedent (Rottenberg, Bylsma, & Vingerhoets, 2008).

Study on the cathartic properties of crying predominantly focuses on adulthood with one study regarding middle childhood finding that girls were more likely to experience catharsis than boys (Jellesma & Vingerhoets, 2012) and one, unpublished, study regarding adolescence (Ardana et al., unpublished manuscript) which found no difference in the frequency of experiencing catharsis between the sexes.

2.3.4 Cognitive Mechanisms of Crying

There have been several attempts to posit an underlying cognitive mechanism for crying behaviour. The conceptualizations put forward have attempted to explain crying with reference to the internal processes an individual goes through which takes them from encountering a stimulus to the production of tears. One of these proposals, put forth by Efran and Spangler (1979), has at its core that the removal of a psychological barrier, such as the need to refrain from expressing an emotion for social reasons, allows the human mind to enter an emotional recovery phase signified outwardly by crying. Efran and Spangler (1979) state that in this way, all crying is due to happiness as it is a joyous moment when there is a cessation of a block to emotional recovery.

Efran and Spangler (1979) conducted a study to test their theory. The study, utilising five participants, asked individuals to watch a movie that provoked emotional reactions

and then read through the script of this movie to highlight exact phrases of dialogue that they believed led to a particular emotional response. By analysing the exact points at which participants cried, the researchers concluded that a pattern of events was apparent in each case. This pattern began with a character in the movie, with which the observer identified, being faced with a barrier that appeared to be impassable and which caused frustration and distress in participants. This was followed by the rapid removal of that barrier which allowed the observer to enter an emotional recovery phase signified by crying. Evidence for the accuracy of this pattern, or how it was identified in each case, was not provided, nor was any formal statistical analysis of data reported. As such, in order to better understand the impact of emotional release on crying, a larger sample and more empirical methodology is needed.

Adopting a more robust design, Labott and Martin (1988) utilised a three-factor experiment with 47 participants. Each group was shown one of two versions of a reportedly tear-inducing movie or a neutral documentary. One group was shown sections of the tear-inducing film, the other group was shown the complete film, notably including the conclusion and stimulus assimilation proposed to represent the removal of a psychological barrier by Efran and Spangler (1979). At different stages during the films, each of the three groups rated their subjectively experienced stress, mood and experience of crying from “no reaction” to “sobbing” on a 9-point scale. As predicted by the Efran and Spangler (1979) theory, a greater number of participants reported crying when exposed to the final resolution of the film than did those who only saw the stimulus incongruent scenes. However, no statistical analysis is presented from which to consider the significance of the results. In addition, the authors noted that the previous exposure of “over half” of the participants to the film may have interfered with their ability to retain a sense of a cognitive barrier as they already knew the final resolution of the film.

Ultimately, though these results provide a promising direction for crying research, they are unable to confirm the explanatory power of the theory.

Another view of crying is proposed by Miceli and Castlefranci's (2003) helplessness conceptualization. Similar to Efran and Spangler (1979), this conceptualization proposes crying is a by-product, rather than an intrinsic process, of the cognitive appraisal of stimuli. The helplessness conceptualization considers the central cognitive mechanism in crying to be the perception that an individual cannot successfully resist or cope with an overwhelmingly difficult situation. Miceli and Castlefranci (2003) posit that it is when an individual feels they are unable to cope with an overwhelming stimulus, and they mentally 'give up', that they outwardly cry.

The basis of Miceli and Castlefranci's (2003) conceptualization is helplessness. In contrast with Efran and Spangler (1979), this conceptualization posits that crying is not the method of release of tension but rather the sign of it being released. Miceli and Castlefranci (2003) outlined a series of otherwise opposite emotional and other processes that result in crying, such as joy and sadness or success and failure. In each of these cases, the theorists argue that crying occurs at the point when an individual mentally acquiesces to their feelings of helplessness. In the case of a positive experience, such as joy or success, this conceptualization begins at the point before the joy or success, when one was striving for a particular outcome, and includes the retrospective evaluation of this tribulation as being difficult enough to warrant giving up, thus crying in this post-imposed helplessness. This hypothesis for positive crying is tenuous; there is no evidence that, in joy, people turn their attention to the suffering that required them to get there. To date, there has been no published attempt to validate the helplessness conceptualization of crying.

2.3.5 Communicative Functions of Crying

Some theorists see crying as a form of social communication where crying is “generated by an individual’s appraisal of the situation and structured by both biological constraints and learned social rules” (Cornelius & Labott, 2001, p. 160) such that it may be involuntary but is based on expected outcomes. Rottenberg, Bylsma and Vingerhoets (2008) found that the receipt of support while crying increases the likelihood of having improved mood after crying and the help soliciting function of tears is well documented (Vingerhoets, 2013). In their investigation of the social and communicative aspects of crying, Hill and Martin (1997) advocated that crying has two purposes: elicitation and communication of empathy. One person may cry to gain attention, sympathy and support while their companion may cry to signal support, sympathy or sincerity. Participants ($N=77$) viewed a video, supervised by an experimenter who either cried or did not cry during the movie. Hill and Martin (1997) found that people in the groups with the crying experimenter cried longer and more intensely than those with the non-crying experimenter. The increased duration and intensity of crying when in the company of other crying people is interpreted as evidence of the use of crying to express and promote empathy, as is supported by the trend of increased sympathy towards crying individuals (Hendriks, Croon, et al., 2008). When subjects were primed to consider crying to convey support they also cried longer and more intensely than those subjects who were conditioned to consider emotional restraint to convey support. Taken together, these findings show support for Hill and Martin’s (1997) conceptualization of crying and, more generally, the utility of understanding crying as a communication method. However, it is unknown at present whether these relationships exist outside of adulthood and aspects of the conceptualization do not account well for infant crying, in particular sympathetic crying. Additionally, these findings are consistent with the more lifespan oriented attachment theory.

2.3.6 Attachment and Crying

Attachment theory is based on the idea that humans are born with an innate attachment system that has the purpose of creating and maintaining relationships with primary caregivers to assist with managing threats and meeting needs (Bowlby, 1969). In infancy, individuals adopt strategies that support this attachment system based on those behaviours that are successful at gaining caregiver support (Mikulincer & Shaver, 2005; Nelson, 2005). For these behaviours to be functional and to promote psychological wellbeing, the primary attachment figure must be available consistently and respond to the infant in a sensitive way. This initial attachment bond has implications for the social and emotional experiences of the child through his or her lifespan (Laan et al., 2012; Maas et al., 2011; Nelson, 1998, 2005b), including altering their ability to relate to infant attachment crying (Schoenmaker et al., 2015). Crying in infants is considered an innate attachment strategy aimed at gaining the support and proximity of caregivers (Vingerhoets & Rottenberg, 2000).

The Strange Situation Test was developed by Ainsworth, Blehar, Waters, and Wall (1978) to study differences in the attachment behaviour of children. The researchers subsequently described three patterns of infant behaviour that they termed “attachment styles”: avoidant, anxious, and secure. Securely attached infants are confident that their primary caregiver will be available and responsive to their needs and so explore with confidence and use their caregiver to help manage frustrations. Alternatively, infants of the other (insecure) attachment styles lack this confidence in their attachment figure, leading anxious infants to cling and become dependent and avoidant infants to ignore their caregiver and dismiss their assistance. Later work by Main and Solomon (1990) yielded a fourth style, disorganized, as they found a sizeable subset of children who were not consistently able to be categorised into one of the other three strategies. These

children experienced such inconsistent responding from caregivers that they found their caregivers to be frightening and unpredictable.

Maas, Laan and Vingerhoets (2011) have described the expected relationship between attachment style and crying behaviour, with securely attached individuals being expected to be more likely to cry when experiencing positive events or emotions. Alternatively, avoidantly attached individuals are expected to cry less frequently, with lower intensity, and for shorter periods of time while anxiously attached individuals are expected to cry more often in negative circumstances as a way to gain the attention of their caregiver. Due to the inherently mixed nature of a disorganized attachment, it would be expected that such children would show an inconsistent mixture of all of these characteristics. As discussed earlier, Bell and Ainsworth (1972) presented results of the apparently responsive nature of infant crying to parental intervention with infants whose parents responded quickly and consistently to their cries, as would be the case in a secure attachment bond, crying with decreasing frequency over the first year of life. Additionally, Milling and Rowe (2009) demonstrated that infants with an avoidant attachment style had significantly lower crying frequency and incidents of crying when sad or when feeling threatened, while those with an anxious attachment style had higher crying proneness, and frequency of crying when feeling under threat or sad. This is what would be expected based on how crying is posited in attachment theory and points to crying being not only an important strategy of communication and attachment, but an index of its success.

Attachment theory is a conceptualization of the whole of human life and adult theories of attachment have been developed as a way of extending these infant styles into the more complex social behaviour of adults. The Relationship Questionnaire was developed by Bartholomew and Horowitz (1991) as an extension of the Hazan and

Shaver (1987) theory of adult attachment. This measure categorises adults into one of four corresponding styles: secure, preoccupied, dismissive and fearful. As would be expected the secure style in adults maps onto secure attachment in infancy. Preoccupied attachment in adults corresponds with the anxious style in infants, while the avoidant attachment style most closely corresponds with dismissive attachment. Finally, the fearful attachment style is proposed to be most similar to the disorganized attachment style of infancy. This categorisation of adult styles has allowed research on the relationship between attachment and crying to extend further into the lifespan.

Laan, van Assen and Vingerhoets (2012) investigated the way in which attachment styles were predictive of crying frequency and intensity, as measured by the Adult Crying Inventory, short form (ACI-S). As predicted, individuals with a dismissive attachment style cried less frequently than others, while individuals who were classified as preoccupied cried the most intensely. Additionally, preoccupied and fearfully attached adults were prone to experiencing more negative emotions while crying. These results point to the importance of attachment as a theory for understanding crying through the lifespan and are underscored in a conceptualization proposed by Nelson (1998). Nelson (1998) suggested that not only does crying help to establish and maintain the attachment ties during the earliest stages of life but, even into adulthood, crying communicates an attachment message not fully realised when crying is considered purely from an emotional release perspective.

Shaver and Mikulincer (2002) propose a hypothesis of how the attachment system may be employed to deal with threats depending on the security of the attachment relationship and the proximity to attachment figures. The attachment based conceptualization of crying, as well as the other conceptualizations discussed above,

considers crying from a psychosocial perspective but some researchers have considered it from an evolutionary perspective and reached different conclusions.

2.3.7 Crying as a Chemical Signal

Several conceptualizations posit a biochemical basis for emotional crying. These conceptualizations primarily focus on the chemicals that are believed to be released in emotional tears and the resultant effect this has on stress hormone levels in the body. Importantly, the composition of emotional tears has been found to differ from that of tears designed to remove irritants from the ocular structure (Frey, DeSota-Johnson, Hoffman, & McCall, 1981). Participants exposed to an emotional stimulus that led to crying produced tears containing a higher concentration of protein than when they shed tears in response to freshly cut onions. An interpretation of this is that emotional tears serve to aid the body in ridding it of excess stress hormones and allowing it to return to a state of homeostasis. However, it has been argued that the release of these chemicals would be on too small a scale to produce a change in the chemical levels of the crier (Gross, Fredrickson, & Levenson, 1994) and there must therefore be an alternate explanation for the composition of emotional tears.

One possible explanation comes from chemosignal research. As tears have been shown to have a role in chemically signalling some sexual behaviours in mice (Haga et al., 2010), Gelstein et al. (2011) investigated the use of tears as a chemosignal in humans. Gelstein et al. (2011) induced emotional crying in several female participants and used the tears produced to investigate the impact on human male sexual behaviour. They found that when men smelled emotional tears produced by women, their subjective sexual arousal as well as their objective sexual arousal decreased, as measured by functional magnetic resonance imaging scans of brain areas related to sexual arousal. In addition, the testosterone levels of the men in the experimental group lowered following exposure to

the tears. This value of emotional tears as chemosignals may be the reason that the chemical composition of emotional tears differs to that of reflex or basal tears and may be an aspect of why humans evolved to cry emotionally.

There have been several reasons posited for the evolution of crying in humans as a useful and adaptive behaviour and aggression reduction in others has received some support. Due to the fact that the release of tears obscures vision, it is believed they may serve as an outward indication of submission to an aggressor considered overwhelmingly powerful (Hasson, 2009). An aggressor seeing that their opponent has impeded their own ability to resist may determine that violence is unnecessary to achieve their outcome. As such, the decreased testosterone in the male participants in Gelstein et al.'s (2011) study may have implications for human aggressive behaviour more generally. Though helping to place crying in an evolutionary context, this conceptualization does not form a complete view of the context and meaning of emotional crying which is unique to humans.

2.3.8 A Meta-Model of Crying

Vingerhoets et al. (2000) proposed a meta-model in an attempt to allow for operationalization and testing of the variables thought to be related to crying, along with the conceptualizations that try to explain them, in a more holistic way. This model suggests that an objective situation or stimulus is appraised by an individual in terms of personal meaning, which leads to an internal representation and understanding of the stimulus for that person. The individual in question then has an emotional reaction to this internal representation and may express this emotion through crying. The review of previous findings and proposed conceptualizations of crying behaviour indicated that personal variables, such as age, sex and personality, interact with each stage of the process that ends in crying. Understanding how personal variables relate to crying is an

important first step in understanding crying behaviour and understanding variability within and between individuals.

2.4. Conclusions and Recommendations for Future Research

As noted by many investigators (e.g., Bylsma et al., 2011; Vingerhoets et al., 2000), crying remains an understudied and poorly understood behaviour. Particularly, the developmental stages other than infancy and adulthood have very little research associated with them. The vast majority of crying research has been conducted using adults or parents of infants, probably due to the logistical difficulties associated with engaging younger individuals in self-reflection and research more broadly. Aside from adulthood there is a fairly substantive body of research regarding crying in infants, typically between birth and one or two years of age. This research has investigated the purpose of infant crying and how it develops across infancy with a particular emphasis on colicky crying. Interestingly, though crying is fairly well studied in infancy, the next period of a child's life is completely neglected. No studies exist which study crying behaviour between the ages of 2 years (Bell & Ainsworth, 1972; Kopp, 1992; Van Ijzendoorn & Hubbard, 2010) and 7 years (Zeman & Shipman, 1996), a period which is accompanied by dramatic physical and social development in children. A single study considers the crying behaviour of children from 9 to 13 years (Jellesma & Vingerhoets, 2012) and only two have directly considered adolescence (Ardana et al., unpublished manuscript; Van Tilburg et al., 2002).

As adolescence is a period of great cognitive, hormonal and emotional change and appears to be the time when sex differences in crying frequency first appear (Van Tilburg et al., 2002), there is great scope for more research to be conducted during this developmental period. Research into the reasons, contexts and outcomes as well as the personal correlates of crying in adolescence is currently lacking. Additionally,

adolescents approach the cognitive capacity of adults, meaning it is only necessary to make small changes to the measures used to study adult crying, where research regarding younger children may require more significant alterations.

A number of conceptualizations have been proposed regarding the purpose of crying with views that range from considering it a means of chemical signalling (Gelstein et al., 2011) to proposals which consider it an attachment behaviour (Bell & Ainsworth, 1972) or as a byproduct of emotions (Bylsma et al., 2008; Rottenberg, Bylsma, & Vingerhoets, 2008). Some of these conceptualizations could be combined in order to provide better understanding. For example, the cathartic view of crying could be linked into an emotion regulation framework, considering crying as one means of emotion regulation. This would place crying into an established framework which may allow greater understanding and more research progress. The same is true for the communicative conceptualization of crying which relates strongly to the attachment perspective on adult crying. This grouping may allow for more consistent, concerted empirical testing of crying conceptualizations.

Some conceptualizations, such as the proposal that crying serves a cathartic function, have been empirically tested, but the data generated are inconclusive regarding how crying and catharsis are linked. Furthermore, many of the current conceptualizations appear too complex to test using traditional quantitative techniques and would require the use of more flexible methods such as structured interviewing. Others have been tested with multiple participants but lack statistical analysis (Labott & Martin, 1988). Fortunately, there are a number of routes towards the better understanding of crying behaviour in general.

The currently developed conceptualizations are predominantly informed by adult crying behaviour. As crying is known to change throughout the lifespan, study of different age groups may provide valuable insights into the purpose of crying more

broadly. By testing existing conceptualizations of crying behaviour on age groups other than adulthood, specifically adolescence, a greater understanding can be achieved than by exploring the conceptualizations in only the adult population or by trying to fill in gaps in the developmental crying literature alone.

The proposed course of research aims to address this lack of empirical examination of conceptualizations by operationalizing and evaluating aspects of the meta-model of crying behaviour proposed by Vingerhoets, et al. (2000) and other conceptualizations of crying that lend themselves to empirical evaluation. In particular, the reappraisal and internal representation stages of the model are proposed as prime candidates for evaluation. In order to better operationalize these sections, the ‘helplessness’ conceptualization proposed by Miceli and Castlefranci (2003) and the ‘release’ theory proposed by Efran and Spangler (1979), will be considered for their usefulness in explaining crying propensity and frequency, as these are the clearest representations of explanations of how a human’s mental processes interact with crying behaviour. Based on these conceptualizations and Vingerhoets et al.’s (2000) meta-model, several underlying themes for why people cry can be constructed. In particular, crying due to frustration, release and for instrumental reasons are proposed as underlying themes around which to consider reasons adolescents may cry.

2.5. References

- Ainsworth, M. D. S., Blehar, M., Waters, E., & Wall, S. (1978). *Patterns of attachment*. Hillsdale, NJ: Erlbaum.
- Ardana, H., Whelan, T., & Melvin, G. (unpublished manuscript). Crying behaviour in adolescence: Gender, mood and emotion regulation.
- Asnes, R. S., & Mones, R. L. (1982). Infantile colic: A review. *Developmental and Behavioral Pediatrics*, 4(1), 57–62.
- Barr, R. (2006). Crying behaviour and its importance for psychosocial development in children. In *Encyclopedia on early childhood development* [online]. Montreal, Quebec: Centre of Excellence for Early Childhood Development; 2006:1-10.
- Barr, R. G., Hopkins, B., & Green, J. A. (2000). Crying as a sign, a symptom and a signal: Evolving concepts of crying behavior. In R. G. Barr, B. Hopkins, & J. A. Green (Eds.), *Crying as a sign, a symptom, and a signal: Clinical, emotional and developmental aspects of infant and toddler crying* (pp. 1–7). London: Mac Keith Press.
- Barr, R., Rotman, A., Yaremko, J., Leduc, D., & Emmet-Francoeur, T. (1992). The crying of infants with colic: A controlled empirical description. *Pediatrics*, 90(1), 14–21.
- Bartholomew, K., & Horowitz, L. M. (1991). Attachment styles among young adults: A test of a four-category model. *Journal of Personality and Social Psychology*, 61, 226–244.
- Becht, M. C., & Vingerhoets, A. J. J. M. (2002). Crying and mood change: A cross-cultural study. *Cognition & Emotion*, 16(1), 87–101.
- Beck, A. T., Ward, C. H., Mendelson, M., & Mock, J. E. (1961). An inventory for measuring depression. *Archives of General Psychiatry*, 4, 561–571.
- Bell, S. M., & Ainsworth, M. D. S. (1972). Infant crying and maternal responsiveness. *Child Development*, 43(4), 1171–1190.

- Bowlby, J. (1969). *Attachment: (Attachment and Loss Series, Vol 1)*. New York.
- Bylsma, L. M., Croon, M. A., Vingerhoets, A. J. J. M., & Rottenberg, J. (2011). When and for whom does crying improve mood? A daily diary study of 1004 crying episodes. *Journal of Research in Personality, 45*(4), 385–392.
- Bylsma, L. M., Vingerhoets, A. J. J. M., & Rottenberg, J. (2008). When is crying cathartic? An international study. *Journal of Social and Clinical Psychology, 27*(10), 1165–1187.
- Campbell, D. W., & Eaton, W. O. (1999). Sex differences in the activity level of infants. *Infant and Child Development, 8*, 1–17.
- Camras, L. A., Oster, H., Campos, J., Campos, R., Ujiie, T., Miyake, K., Wang, L, & Meng, Z. (1998). Production of emotional facial expressions in European American, Japanese, and Chinese infants. *Developmental Psychology, 34*(4), 616–28.
- Cornelius, R. R., & Labott, S. M. (2001). The social psychological aspects of crying. In A. J. J. M. Vingerhoets & R. R. Cornelius (Eds.), *Adult crying: A biopsychosocial approach* (pp. 159-176). Hove, East Sussex: Brunner-Routledge.
- Darwin, C. (1872). *The expression of the emotions in man and animals*. London, UK: Murray.
- De Fruyt, F. (1997). Gender and individual differences in adult crying. *Personality and Individual Differences, 22*(6), 937–940.
- Denckla, C. A., Fiori, K. L., & Vingerhoets, A. J. J. M. (2014). Development of the Crying Proneness Scale: Associations among crying proneness, empathy, attachment, and age. *Journal of Personality Assessment, 96*(6), 619–31.
- Efran, J. S., & Spangler, T. J. (1979). Why grown-ups cry. *Motivation and Emotion, 3*(1), 63–72.

Feldman, S. S. (1956). Crying at the Happy Ending. *Journal of the American Psychoanalytic Association*, 4(3), 477–485.

Frey, W. H., DeSota-Johnson, D., Hoffman, C., & McCall, J. T. (1981). Effect of stimulus on the chemical composition of human tears. *American Journal of Ophthalmology*, 92, 559–567.

Frey, W. H., & Langseth, M. (1985). *Crying: The mystery of tears*. Minneapolis: Winston Press.

Garrison, M. M., & Christakis, D. A. (2000). A systematic review of treatments for infant colic. *Pediatrics*, 106(Supplement 1), 184–90.

Gelstein, S., Yeshurun, Y., Rozenkrantz, L., Shushan, S., Frumin, I., Roth, Y., & Sobel, N. (2011). Human tears contain a chemosignal. *Science*, 331(6014), 226–30.

Gračanin, A., Bylsma, L. M., & Vingerhoets, A. J. J. M. (2014). Is crying a self-soothing behavior? *Frontiers in Psychology*, 5, 502.

Gračanin, A., Vingerhoets, A. J., Kardum, I., Zupčić, M., Šantek, M., & Šimić, M. (2015). Why crying does and sometimes does not seem to alleviate mood: A quasi-experimental study. *Motivation and emotion*, 39(6), 953-960.

Gross, J. J. (1998a). Antecedent- and response-focused emotion regulation: Divergent consequences for experience, expression, and physiology. *Journal of Personality and Social Psychology*, 74(1), 224–37.

Gross, J. J. (1998b). The emerging field of emotion regulation: an integrative review. *Review of General Psychology*, 2(3), 271–299.

Gross, J. J., Fredrickson, B. L., & Levenson, R. W. (1994). The psychophysiology of crying. *Psychophysiology*, 31, 460–468.

Gross, J. J., & John, O. P. (2003). Individual differences in two emotion regulation processes: Implications for affect, relationships, and well-being. *Journal of Personality and Social Psychology*, 85(2), 348–362.

Gurland, B. J. (1976). The comparative frequency of depression in various adult age groups. *Journal of Gerontology*, 31(3), 283–92.

Gyurak, A., Gross, J. J., & Etkin, A. (2011). Explicit and implicit emotion regulation: A dual-process framework. *Cognition & Emotion*, 25(3), 400–12.

Haga, S., Hattori, T., Sato, T., Sato, K., Matsuda, S., Kobayakawa, R., ... Touhara, K. (2010). The male mouse pheromone ESP1 enhances female sexual receptive behaviour through a specific vomeronasal receptor. *Nature*, 466(7302), 118–22.

Hankin, B. L., Abramson, L. Y., Moffitt, T. E., Silva, P. A., Mcgee, R., & Angell, K. E. (1998). Development of depression from preadolescence to young adulthood: Emerging gender differences in a 10-Year longitudinal study. *Journal of Abnormal Psychology*, 107(1), 128–140.

Hare, T. A., Tottenham, N., Galvan, A., Voss, H. U., Glover, G. H., & Casey, B. J. (2008). Biological substrates of emotional reactivity and regulation in adolescence during an emotional go-nogo task. *Biological Psychiatry*, 63(10), 927–34.

Hasson, O. (2009). Emotional tears as biological signals. *Evolutionary Psychology*, 7(3), 363–370.

Hastrup, J. L., Baker, J. G., Kraemer, D. L., & Bornstein, R. F. (1986). Crying and depression among older adults. *The Gerontologist*, 26(1), 91–6.

Hastrup, J. L., Kraemer, D. T., Bornstein, R. F., & Trezza, G. R. (2001). Crying frequency across the lifespan. In A. J. J. M. Vingerhoets & R. R. Cornelius (Eds.), *Adult crying: A biopsychosocial approach* (pp. 55–71). Hove, East Sussex: Brunner-Routledge.

Hazan, C., & Shaver, P. R. (1987). Romantic love conceptualized as an attachment process. *Journal of Personality and Social Psychology*, *52*, 511–524.

Hendriks, M. C. P., Croon, M. A., & Vingerhoets, A. J. J. M. (2008). Social reactions to adult crying: The help-soliciting function of tears. *The Journal of Social Psychology*, *148*(1), 22–41.

Hendriks, M. C. P., Nelson, J. K., Cornelius, R. R., & Vingerhoets, A. J. J. M. (2008). Why crying improves our well-being: an attachment-theory perspective on the functions of adult crying. In A. J. J. M. Vingerhoets, I. Nyklíček, & J. Denollet (Eds.), *Emotion regulation* (pp. 87–96). New York: Springer.

Jellesma, F. C., & Vingerhoets, A. J. (2012). Crying in middle childhood: A report on gender differences. *Sex roles*, *67*(7-8), 412-421.

Kopp, C. B. (1992). Emotional distress and control in young children. *New Directions for Child Development*, *55*, 41–56.

Kottler, J. A., & Montgomery, M. J. (2001). Theories of crying. In A. J. J. M. Vingerhoets & R. R. Cornelius (Eds.), *Adult crying: A biopsychosocial approach* (pp. 1–18). Hove, East Sussex: Brunner-Routledge.

Laan, A. J., van Assen, M. a. L. M., & Vingerhoets, A. J. J. M. (2012). Individual differences in adult crying: The role of attachment styles. *Social Behavior and Personality: An International Journal*, *40*(3), 453–471.

Labott, S. M., & Martin, R. B. (1988). Weeping: Evidence for a cognitive theory. *Monographs of the Society for Research in Child Development*, *12*(3), 205–216.

Landreth, C. (1941). Factors associated with crying in young children in the nursery school and the home. *Child Development*, *12*(2), 81–97.

Lombardo, W. K., Cretser, G. A., & Roesch, S. C. (2002). For crying out loud - The differences persist into the '90s. *Sex Roles*, *45*, 529–547.

Lucassen, P. L., Assendelft, W. J., Gubbels, J. W., van Eijk, J. T., van Geldrop, W. J., & Neven, A. K. (1998). Effectiveness of treatments for infantile colic: Systematic review. *BMJ*, *316*(7144), 1563–9.

Lucassen, P. L., Assendelft, W. J., van Eijk, J. T., Gubbels, J. W., Douwes, a C., & van Geldrop, W. J. (2001). Systematic review of the occurrence of infantile colic in the community. *Archives of Disease in Childhood*, *84*(5), 398–403.

Maas, J., Laan, A., & Vingerhoets, A. J. J. M. (2011). Attachment, emotion regulation and adult crying. In I. Nyklíček, A. Vingerhoets, & M. Zeelenberg (Eds.), *Emotion regulation and well-being* (pp. 181–195). New York: Springer New York.

Main, M., & Solomon, J. (1990). Procedures for identifying infants as disorganized/disoriented during the Ainsworth Strange Situation. In M. T. Greenberg, D. Cicchetti, & E. M. Cummings (Eds.), *Attachment in the preschool years: Theory, research, and intervention*. Chicago, IL: University of Chicago Press.

Martin, R. B., & Labott, S. M. (1991). Mood following emotional crying: Effects of the situation. *Journal of Research in Personality*, *25*(2), 218–244.

Mehrabian, A., & Epstein, N. (1972). A measure of emotional empathy. *Journal of Personality*, *40*(4), 525–543.

Miceli, M., & Castelfranchi, C. (2003). Crying: discussing its basic reasons and uses. *New Ideas in Psychology*, *21*(3), 247–273.

Mikulincer, M., & Shaver, P. R. (2005). Attachment theory and emotions in close relationships: Exploring the attachment-related dynamics of emotional reactions to relational events. *Personal Relationships*, *12*(2), 149–168.

Milling, A. & Rowe, A. (2009). Attachment styles and adult crying behaviour. *International Society for Research on Emotion*, Leuven, Belgium, August 2009, Conference Proceedings.

Nash, C., Morris, J., & Goodman, B. (2008). A study describing mothers' opinions of the crying behaviour of infants under one year of age. *Child Abuse Review*, 17, 191–200.

Nelson, J. K. (1998). The meaning of crying based on attachment theory. *Clinical Social Work Journal*, 26(1), 9–22.

Nelson, J. K. (2000). Clinical assessment of crying and crying inhibition based on attachment theory. *Bulletin of the Menninger Clinic*, 64(4), 509–29.

Nelson, J. K. (2005a). *Seeing through tears: Crying and attachment* (1st ed.). New York, NY: Brunner-Routledge.

Peter, M., Vingerhoets, A. J., & Van Heck, G. L. (2001). Personality, gender, and crying. *European Journal of Personality*, 15(1), 19-28.

Nolen-Hoeksema, S., & Aldao, A. (2011). Gender and age differences in emotion regulation strategies and their relationship to depressive symptoms. *Personality and Individual Differences*, 51(6), 704–708.

Nolen-Hoeksema, S., & Girgus, J. S. (1994). Emergence of gender differences in depression during adolescence. *Psychological Bulletin*, 115(3), 424–443.

Oldbury, S., & Adams, K. (2015). The impact of infant crying on the parent-infant relationship. *The Community Practitioner*, 88(3), 29–34.

Patel, V. (1993). Crying behavior and psychiatric disorder in adults: A review. *Comprehensive Psychiatry*, 34(3), 206–211.

Peter, M., Vingerhoets, A. J., & Van Heck, G. L. (2001). Personality, gender, and crying. *European Journal of Personality*, 15(1), 19-28.

Piccinelli, M., & Wilkinson, G. (2012). Gender differences in depression: Critical review. *British Journal of Psychiatry*, 177, 486–492.

Reynolds, W. M. (2002). *Reynolds Adolescent Depression Scale. Professional manual* (2nd ed.). Lutz, FL: Psychological Assessment Resources.

Rice, K. G. (1990). Attachment in adolescence: A narrative and meta-analytic review. *Journal of Youth and Adolescence*, *19*(5), 511–38.

Rottenberg, J., Bylsma, L. M., & Vingerhoets, A. J. J. M. (2008). Is crying beneficial? *Current Directions in Psychological Science*, *17*(6), 400–404.

Rottenberg, J., Bylsma, L. M., Wolvin, V., & Vingerhoets, A. J. J. M. (2008). Tears of sorrow, tears of joy: An individual differences approach to crying in Dutch females. *Personality and Individual Differences*, *45*(5), 367–372.

Rottenberg, J., Cevaal, A., & Vingerhoets, A. J. J. M. (2008). Do mood disorders alter crying? A pilot investigation. *Depression and Anxiety*, *25*(5), E9–15.

Rottenberg, J., Gross, J. J., Wilhelm, F. H., Najmi, S., & Gotlib, I. H. (2002). Crying threshold and intensity in major depressive disorder. *Journal of Abnormal Psychology*, *111*(2), 302–312.

Rottenberg, J., & Vingerhoets, A. J. J. M. (2012). Crying: Call for a lifespan approach. *Social and Personality Psychology Compass*, *6*(3), 217–227.

Schoenmaker, C., Huffmeijer, R., van IJzendoorn, M. H., Bakermans-Kranenburg, M. J., van den Dries, L., Linting, M., Juffer, F. (2015). Attachment and physiological reactivity to infant crying in young adulthood: Dissociation between experiential and physiological arousal in insecure adoptees. *Physiology & Behavior*, *139*, 549–556.

Shaver, P. R., & Mikulincer, M. (2002). Attachment-related psychodynamics. *Attachment & Human Development*, *4*(2), 133–61.

Simons, G., Bruder, M., van der Löwe, I., & Parkinson, B. (2013). Why try (not) to cry: Intra- and inter-personal motives for crying regulation. *Frontiers in Psychology*, *3*, 597.

Soltis, J. (2004). The signal functions of early infant crying. *The Behavioral and Brain Sciences*, 27(4), 443–490.

St James-Roberts, I., Bowyer, J., Varghese, S., & Sawdon, J. (1994). Infant crying patterns in Manali and London. *Child: Care, Health and Development*, 20(5), 323–37.

Stougie, S., Vingerhoets, A. J. J. M., & Cornelius, R. R. (2004). Crying, catharsis and health. In I. Nyklíček, L. Temoshok, & A. J. J. M. Vingerhoets (Eds.), *Emotional expression and health: advances in theory, assessment and clinical applications* (pp. 1–17). New York: Brunner-Routledge.

Taubman, B. (1984). Clinical trial of the treatment of colic by modification of parent-infant interaction. *Pediatrics*, 74(6), 998–1003.

Taubman, B. (1988). Parental counseling compared with elimination of cow's milk or soy milk protein for the treatment of infant colic syndrome: A randomized trial. *Pediatrics*, 81(6), 756–761.

Theory. (n.d.). In *Merriam-Webster's online dictionary*. Retrieved November 7, 2015, from <http://www.merriam-webster.com/dictionary/theory>

Thompson, R. A. (1994). Emotion regulation: A theme in search of definition. *Monographs of the Society for Research in Child Development*, 59(2), 25–52.

Tsai, J. L., Levenson, R. W., & Carstensen, L. L. (2000). Autonomic, subjective, and expressive responses to emotional films in older and younger Chinese Americans and European Americans. *Psychology and Aging*, 15(4), 684–93.

Van Haeringen, N. J. (2001). The (neuro)anatomy of the lacrimal system and the biological aspects of crying. In A. J. J. M. Vingerhoets & R. R. Cornelius (Eds.), *Adult crying: A biopsychosocial approach* (pp. 19–36). Hove: Routledge.

Van Hemert, D. A., van de Vijver, F. J. R., & Vingerhoets, A. J. J. M. (2011). Culture and crying: Prevalences and gender differences. *Cross-Cultural Research, 45*(4), 399–431.

Van Ijzendoorn, M., & Hubbard, F. (2010). Are infant crying and maternal responsiveness during the first year related to infant-mother attachment at 15 months? *Attachment & Human Development, 2*(3), 371–391.

Van Tilburg, M. A. L., Unterberg, M. L., & Vingerhoets, A. J. J. M. (2002). Crying during adolescence: The role of gender, menarche, and empathy. *British Journal of Developmental Psychology, 20*(1), 77–87.

Vingerhoets, A. J. J. M. (2013). *Why only humans weep: unravelling the mysteries of tears*. Croydon: Oxford University Press.

Vingerhoets, A. J. J. M., Cornelius, R. R., Van Heck, G. L., & Becht, M. C. (2000). Adult crying: A model and review of the literature. *Review of General Psychology, 4*(4), 354–377.

Vingerhoets, A. J. J. M., & Rottenberg, J. (2000). Adult crying: A model and review of the literature. *Review of General Psychology, 4*(4), 354–377.

Vingerhoets, A. J. J. M., Rottenberg, J., Cevaal, A., & Nelson, J. (2007). Is there a relationship between depression and crying? A review. *Acta Psychiatrica Scandinavica, 115*(5), 340–51.

Vingerhoets, A. J. J. M., & Scheirs, J. (2000). Sex differences in crying: Empirical findings and possible explanations. *Gender and Emotion: Social Psychological Perspectives, 2*, 143–165.

Wessel, M. A., Cobb, J. C., Jackson, E. B., Harris, G. S., & Detwiler, A. C. (1954). Paroxysmal fussing in infancy, sometimes called “colic.” *Pediatrics, 14*(5), 421.

Wood, E. C., & Wood, C. D. (1984). Tearfulness: A psychoanalytic interpretation. *Journal of the American Psychoanalytic Association*, 32(1), 117–136.

Yurgelun-Todd, D. (2007). Emotional and cognitive changes during adolescence. *Current Opinion in Neurobiology*, 17(2), 251–7.

Zeifman, D. M. (2001a). An ethological analysis of human infant crying: Answering Tinbergen's four questions. *Developmental Psychobiology*, 39(4), 265–285.

Zeifman, D. M. (2001b). Why Crying is a Developmental Question. In A. J. J. M. Vingerhoets & R. R. Cornelius (Eds.), *Adult crying: A biopsychosocial approach* (pp. 37-54). Hove, East Sussex: Brunner-Routledge.

Zeman, J., & Shipman, K. (1996). Children's expression of negative affect: Reasons and methods. *Developmental Psychology*, 32(5), 842–849.

Chapter 3. Crying Proneness through a Developmental Lens: Late Childhood to Adolescence

3.1 Preamble to empirical paper

This chapter examines personal characteristics which are linked to crying frequency. Specifically, this chapter explores differences in crying behaviour depending on age and gender as well as empathy levels, parental style, emotion regulation and experience of feelings of guilt and shame. This is the only study to empirically pinpoint the age at which the crying behaviour of males and females begins to differ and this finding alone is a substantive contribution to the literature. The additional findings of this paper contribute markedly to the currently depauperate literature regarding adolescent crying.

The article was submitted to *Child Development* on the 19th of January, 2015. *Child Development* is an international journal which publishes theoretical and applied research regarding development from the foetal period through to adolescence. The journal has an impact factor of 4.235. This paper has been formatted in accordance with the style specified by the editorial board of this journal.

Monash University

3.2 Declaration of thesis chapter 3

In the case of chapter 3, the nature and extent of my contribution to the work was the following:

Nature of contribution	Extent of contribution
Literature review, project design, data collection, data analysis and writing of paper.	70%

The following co-authors contributed to the work. If co-authors are students at Monash University, the extent of their contribution in percentage terms must be stated:

Name	Nature of contribution	Extent of contribution (%) for student co-authors only
Dr Glenn Melvin	Contributed to study design, data collection input, review of manuscript drafts and general supervisory input.	
Dr Eleonora Gullone	Contributed to study design, data collection input, review of manuscript drafts and general supervisory input.	
Dr Tom Whelan	Contributed to study design, data collection input, review of manuscript drafts and general supervisory input.	

The undersigned hereby certify that the above declaration correctly reflects the nature and extent of the candidate's and co-authors' contributions to this work.

Candidates Signature

Date

Main Supervisor's Signature

Date

3.3 Title Page

Running Title

Crying proneness through a developmental lens: late childhood to adolescence

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3.4. Abstract

Adolescence is a critical period for understanding the development of crying behaviour, yet it has received little research attention. This study investigated the crying behaviour of 773 females and 623 males aged between 9 and 16 years. These participants were recruited over a three year period and completed several questionnaires measuring crying proneness, emotion regulation, parenting style and mood states. This study revealed a significant difference in the crying behaviour of children aged younger than 11 years compared with older children. Most interestingly, no sex difference was noted in the crying behaviour of younger children but, from age 11 on, females were more prone to cry than males. Additionally, the variables relating to crying behaviour changed before and after age 11. Participants younger than 11 who felt like crying most often were more likely to be empathic and have parents who exhibit a caring parenting style. Participants of both sexes aged 11 years and older were also more likely to cry if they were more empathic and less likely to cry if they used cognitive reappraisal as an emotion regulation strategy. Older females were also more likely to cry if they used suppression as an emotion regulation strategy, had high tendency towards shame, and had parents who exhibited a caring parenting style. These findings implicate crying as having an emotion regulation function. In addition, the results provide a starting point for the categorisation of young people into developmental stages (i.e., <11 and \geq 11 years of age) based on their crying behaviour.

3.5. Introduction

Crying occurs throughout the lifespan but it has only received significant attention from the scientific community in two broad developmental periods: infancy and adulthood (Rottenberg & Vingerhoets, 2012). During infancy, crying is primarily understood to be a communication strategy (Bell & Ainsworth, 1972; Soltis, 2004), and becomes a complex and multifaceted behaviour by adulthood (Rottenberg, Bylsma, & Vingerhoets, 2008; Rottenberg, Cevaal, et al., 2008). Due to significant developmental differences between infancy and adulthood, childhood and adolescence are clearly important developmental periods to determine how crying develops in humans. It is particularly noteworthy that crying behaviour has received scant attention during the adolescent period, a developmental stage marked by high emotional variability, significant cognitive development, identity formation (Cooper, Grotevant, & Condon, 1983), and a growing independence (Van Tilburg, Unterberg, & Vingerhoets, 2002).

Similarly, the emergence of sex differences in crying is in need of further examination. Whilst it is well established that females cry more often and at a lower threshold than males during adulthood (Lombardo, Cretser, & Roesch, 2002; Peter, Vingerhoets, & Van Heck, 2001), any such sex differences in infancy and childhood are more subtle (Bell & Ainsworth, 1972; Van Ijzendoorn & Hubbard, 2010). There is evidence that male infants cry more frequently than female infants, yet this is attributed to sex differences in activity levels rather than in propensity to cry (Campbell & Eaton, 1999). Although there is no information relating to sex differences in the crying propensity of children aged between 1 and 9 years, there is evidence that young girls feel more comfortable expressing their emotions than boys of the same age (Zeman & Shipman, 1996).

Frey and Langseth (1985) posited that sex differences in crying do not begin until adolescence. However, a study by Jellesma and Vingerhoets (2012) examining 186

children aged between 9 and 13 years, found that a sex difference in crying was evident when the sample was taken as a whole. The researchers proposed that this difference was due to parental socialisation, differences in sexed peer pressure and differing experiences of the strength of internalising emotions. Jellesma and Vingerhoets (2012) provided one of the few investigations into sex differences in a preadolescent and adolescent age group. Yet they did not identify the different developmental patterns for males and females, nor did they determine when the sex differences in crying behaviour first emerge.

It has been theorised that infant crying and the consequent parental response help to establish and maintain the parent-child attachment bond (Nelson, 1998). The nature of this initial attachment bond is believed to have implications for social and emotional experiences throughout the lifespan (Laan, van Assen, & Vingerhoets, 2012; Maas, Laan, & Vingerhoets, 2011). Of importance to the way in which crying changes in early infancy is the way in which parents respond to infant cries (Bell & Ainsworth, 1972; Van Ijzendoorn & Hubbard, 2010). Two aspects of parenting that have been linked to child wellbeing and behaviour are parental care and parental overprotection (Parker, Hadzi-Pavlovic, Greenwald, & Weissman, 1995). Parental care is a measure of the warmth and emotional availability of a parent while parental overprotection is a measure of the level of restriction or control a parent applies. Though little research has examined the crying behaviour of children after the infant stage, it appears that crying continues to be used as a method of gaining the attention of their parents as well as a means of resolving other social circumstances throughout childhood (Rottenberg & Vingerhoets, 2012; Zeman & Shipman, 1996). Whether this continues through to adolescence is currently unclear.

An alternative view of the function of crying is its potential to operate as an emotion regulator through venting, or catharsis (Bylsma, Croon, Vingerhoets, & Rottenberg, 2011; Bylsma, Vingerhoets, & Rottenberg, 2008). Emotion regulation is a

construct which encompasses how well individuals are able to influence their emotional state (Gross, 1998) through the use of a wide variety of strategies (Gross & John, 2003; Nolen-Hoeksema & Aldao, 2011). To date, most research into emotion regulation has focused on reappraisal, the use of cognitive reframing to decrease or alter the emotional valence of a situation, and suppression, a means of hiding an emotional experience with the goal of decreasing the potency of the felt emotion (Gross, 1998). Both reappraisal and suppression are considered intentional or explicit emotion regulation strategies that are sometimes used subconsciously with research generally pointing to reappraisal as being more constructive than suppression (Gross, 2002).

Recently, there has been increasing scientific interest in implicit emotion regulation, which refers to strategies that are not actively engaged in, such as venting (Gyurak, Gross, & Etkin, 2011). There is some indication that crying could be viewed as both an implicit and explicit emotion regulation strategy depending on the circumstance (Becht & Vingerhoets, 2002; Bylsma et al., 2008; Maas et al., 2011; Rottenberg, Bylsma, Wolvin, & Vingerhoets, 2008). Previous research into crying has found that the use of cognitive reappraisal is related to catharsis after crying (Ardana, Whelan, & Melvin, unpublished manuscript), but no study to date has considered the use of suppression and reappraisal in relation to crying across both childhood and adolescence. Due to the growing literature regarding individual experiences of emotion following crying (Hill & Martin, 1997; Maas et al., 2011; Miceli & Castelfranchi, 2003), the relationship of crying to established strategies for emotion regulation, as well as its capacity as an implicit emotion regulation strategy, must be considered.

Strong emotions are hypothesised to be linked to crying but there is little quantitative research investigating which emotions influence and are influenced by crying (Vingerhoets et al., 2000). Related to, but separate from crying in an attachment context,

empathic crying is thought to serve multiple social functions. By crying, people express both support for someone's emotions or situation and their sympathy towards that individual (Hill & Martin, 1997). Quantitative studies support this, showing that people with high trait empathy are more likely to cry in response to both negative and positive stimuli (Rottenberg, Bylsma, Wolvin, et al., 2008). Additionally, the greater incidence of female crying when compared with male crying has been linked to the rate at which trait empathy increases in females during adolescence (Van Tilburg et al., 2002). However, few other emotional experiences have been considered in relation to crying. Of particular interest are the self-conscious emotions such as guilt, shame and blame. This class of secondary emotions has been found to be related to reparative behaviours such as apologising for transgressions and attempting to rectify them in childhood and adolescence (Eisenberg, 2000), but has yet to receive attention in relation to crying during any developmental period. Though there is consensus that emotions are implicated in crying, precisely which emotions are involved and how remains unknown and warrants investigation.

This study aims to address some of the gaps in the understanding of crying behaviour by investigating the frequency with which a mixed-sex sample of children and adolescents report that they feel like crying. Feeling like crying has been found to be related to outcomes linked with the physical expression of crying (Kraemer & Hastrup, 1986) and is an important part of crying behaviour; this is interpreted throughout this article as a measure of crying proneness. The aims of this study are to identify the age at which a difference between the sexes emerges in self-reported crying proneness and to examine other differences in crying behaviour related to factors including emotion regulation strategies, tendencies towards particular emotions, development of empathy and the style of parenting they have experienced. It was hypothesised that females report

that they feel like crying more often than males do, with differences becoming greater with increased age. It was also hypothesised that higher reported use of cognitive reappraisal in emotion regulation would be correlated with feeling like crying less frequently, while higher reported suppression would be correlated with feeling like crying more frequently. Further, participants who report having parents who are less caring and more overprotective were expected to report feeling like crying more frequently than those with more caring, less overprotective parents. Finally, it was hypothesised that high levels of empathy, guilt and shame would be correlated with increased frequency of feeling like crying.

3.6. Method

Participants

The analysis utilises a cross-sectional sample of children and adolescents recruited from 15 primary schools and 9 secondary schools in metropolitan Melbourne, Australia ($N = 1,392$). The sample contained 773 female participants (mean age of 12.22, SD 1.63) and 623 male participants (mean age of 11.93, SD 1.56), aged between 9 and 16 years. This investigation was conducted as part of a larger study examining the development of self-conscious emotions and relationships between self-conscious emotions and psychological wellbeing (Gullone, Hughes, King, & Tonge, 2010).

Materials

The Children's Depression Inventory (CDI) is a measure of depressive symptomology that can be used with children and adolescents. It has demonstrated convergent validity with the Child Behavior Checklist, Reynolds Adolescent Depression Scale, Hamilton Depression Scale, and Children's Depression Scale (Sitarenios & Stein, 2004), and sound reliability with a Cronbach's alpha of .87 (Kovacs & Staff, 2003). Participants are provided with three statements and are asked to choose the one that best

describes them over the previous 2 weeks. The CDI includes an item asking participants to rate their crying proneness, item 10, which was used as the outcome variable in this study. The statements are: “I feel like crying once in a while”, “I feel like crying many days”, and “I feel like crying every day”. The total CDI was used without the crying item (item 10), while item 9, which pertains to suicide, was not included in the survey.

The Emotion Regulation Questionnaire for Children and Adolescents (Gullone & Taffe, 2012) was used to collect information about emotion regulation. This consists of 10 items assessing cognitive reappraisal (6 items) and expressive suppression (4 items). Higher scores on each scale indicate greater use of the corresponding emotion regulation strategy. The measure has good internal reliability in Australian populations (Cronbach’s alpha of .68-.84), and construct validity, correlating with the five factors of the Big-Five Questionnaire for children ranged from 0.2 and 0.3 (Gullone & Taffe, 2012).

Parenting style was assessed using the Parental Bonding Instrument (Parker, Tupling, & Brown, 1979), a 50 question survey split into two parts, one for each parent, and answered by the child. It assesses statements of the child or adolescent’s retrospective view of both their mother and father using 4-point Likert scales. The measure has sound internal consistency, with Cronbach’s alpha of .81 for the Overprotection subscale and .90 for Care, and good convergent validity with interviewer ratings of care, showing correlations of .77 to .78 (Herz & Gullone, 1999). The wording of the measure was revised to be relevant for current, rather than past, parenting due to the age of participants.

The Index of Empathy for Children and Adolescents is a 22 item measure of empathy. It asks young people to rate statements on a 9-point Likert scale and higher scores indicate higher reported empathy. The scale has shown good reliability, with test-retest coefficients of .74-.85, and convergent validity of up to .77 with other scales of empathy (Bryant, 1982).

Guilt, shame and blame were assessed using the Test of Self Conscious Affect for Adolescents (TOSCA-A; Tangney, Wagner, Gavlas, & Gramzow, 1991). The survey is scenario based with several statements following each scenario designed to elicit shame, guilt and externalizing blame responses measured on a 5-point Likert scale.

It has demonstrated sound convergent validity with measures of anger, empathy and psychological symptoms (Tangney, Wagner, Barlow, Marschall, & Gramzow, 1996) and internal reliability, with Cronbach's alpha of .77-.79 for the shame subscale and .81-.84 for guilt, for young people (Tangney & Dearing, 2002).

Procedure

Ethics clearance was obtained from the Monash University Human Research Ethics Committee to analyse these data with respect to crying propensity. Survey data were collected cross-sectionally during 2005-2007 (Gullone et al., 2010). Explanatory statements and consent forms for parents and young people were distributed to children at school. Completed parental consent forms were returned to school by the children. Children with informed parental consent, and who gave their own written informed consent, completed written questionnaires at their school under supervision of the researchers and a representative of the school. The questionnaires were administered in a counterbalanced order to minimise any order effect and it was emphasized to all participants that there were no right or wrong answers. The time taken to complete the questionnaires varied from 30-45 minutes dependent largely on grade level.

Data analysis

All data analysis was performed using SPSS Version 20.0 (SPSS Inc., 2011). First, all variables were cross-correlated using a non-parametric correlation matrix to investigate possible multicollinearity in the responses the full table of which can be found in Appendix L, Table L.1. Variables were excluded if they had a correlation coefficient greater than .5, or multiple correlation coefficients greater than .4, which only occurred in

the case of depressive tendency. This was undertaken conservatively due to the very large number of participants and the consequent increase in the impact each correlation would have on the relationship with the dependent variable. There were missing data for only .4% of participants on the outcome variable but a very large floor effect with 85.1% of participants choosing the lowest option (“I feel like crying once in a while”).

To determine if a sex difference in crying behaviour was maintained across age groups, an Analysis of Variance (ANOVA) was conducted with sex and age, categorised into whole years, as grouping variables, and crying proneness as the outcome variable. Due to the small number of 15 and 16 year olds (total $n=41$), they were excluded from this analysis to conserve power and consistency. Post hoc comparison between discrete years of age was conducted using Tukey tests to determine at which ages a sex difference in crying proneness was significant.

Following this, two multinomial logistic regression analyses were performed to assess the relationship between crying proneness and the remaining predictor variables. The first regression was conducted for participants under the age at which crying proneness began to differ between the sexes, as determined by the ANOVA analyses. The second analysis was performed for participants aged older than this point and was carried out for males and females separately. In both of these analyses crying proneness, as measured by item 9 of the CDI, was entered as a 3 level categorical outcome variable and sex, age, empathy, suppression, reappraisal, shame, guilt, externalising blame, and parental care and overprotection were entered as predictor variables.

3.7. Results

Results from the two factor ANOVA showed significant main effects for age [$F_{(5, 1330)} = 2.96, p < .05$] and sex [$F_{(1, 1330)} = 22.07, p < .05$], as well as a significant interaction between age and sex [$F_{(5, 1330)}=2.78, p<.05$], with means for each age

shown in Figure 3.1 by gender. Post hoc comparison of mean response on item 9 of the CDI for males and females at different ages revealed that sex did not significantly predict frequency of feeling like crying differences at ages 9 or 10 (both p values $> .05$) but did significantly predict differences at age 11 and thereafter (all p values $< .05$).

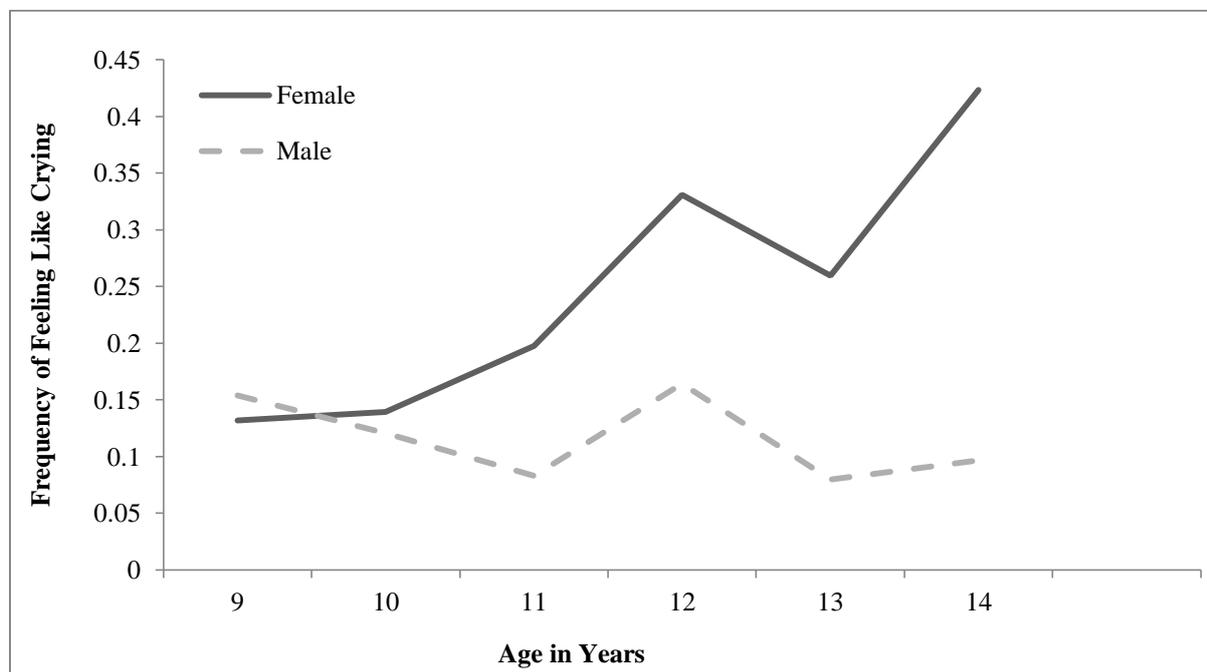


Figure 3.1: Frequency of feeling like crying by participant age, grouped by sex

As can be seen in Figure 3.1, the crying proneness of males was relatively stable across the ages sampled, while females' crying proneness increased with age. Due to this sex difference, further analyses were carried out on subsets of the data. Basic descriptive statistics for all non-dichotomous variables entered into these analyses can be found in Table 3.1 arranged by age and sex.

Logistic regression analysis examining the relationship between crying proneness and variables of interest significantly predicted crying proneness for all participants under the age of 11 years [$X^2(752, n=18)=186.36, p<.001$]. Another logistic regression was run for participants aged 11 years or older, this time separated by sex to determine how the

crying behaviour of older participants related to variables of interest and significantly predicted the relationships for both females [$X^2(16, n=571)=134.04, p<.001$] and males [$X^2(16, n=433)=41.95, p<.001$]. The regressions are presented in Tables 3.2 and 3.3 with converted relative risk ratios to represent percentage change.

Table 3.1

Means and standard deviations for dependent variable, feeling like crying, and predictor variables. Statistics reported for all participants aged younger than 11 years, females older than 11 years, and males older than 11 years.

	Both sexes younger than 11 years	Females older than 11 years	Males older than 11 years
	Mean (SD)	Mean (SD)	Mean (SD)
Feeling like Crying	0.13 (0.42)	0.29 (0.59)	0.11 (0.38)
Depressive Tendency	10.1 (7.15)	10.48 (7.98)	9.47 (7.07)
Empathy	56.36 (7.46)	61.74 (7.51)	55.44 (7.25)
Shame	40.33 (9.95)	40.74 (9.52)	38.87 (9.18)
Guilt	57.01 (10.4)	58.51 (8.84)	54.27 (10.17)
Externalizing	40.15 (12.26)	38.61 (10.42)	42.43 (10.88)
Emotional Reappraisal	21.27 (4.13)	20.82 (4.13)	20.55 (4.45)
Emotional Suppression	11.59 (3.04)	10.3 (3.18)	11.46 (3.18)
Parental Care	27.19 (6.52)	28.12 (7.15)	27.48 (6.61)
Parental Overprotection	14.7 (6.24)	13.18 (7.04)	12.87 (6.95)

Table 3.2

Percentage converted relative risk ratios of predictor variables entered into the regression models for participants younger than 11 with feeling like crying as the outcome variable.

Predictor Variable	Younger than 11	
	Many Days	Every Day
Maleness	+6%	+2%
Empathy	+9%*	+19%*
Reappraisal	-4%	-12%
Suppression	-11%	-39%*
Shame	+4%	+1%
Guilt	0%	-6%
Externalizing Blame	0%	-1%
Parental Care	-8%*	-6%
Parental Overprotection	0%	+3%

*Note: Significance of predictor ($p < .05$) in the model is denoted by an *; percentages above can be understood as the increase or decrease in chance of participants selecting feeling like crying “many days” or “every day” as compared with “few days” for each unit increase on the predictor variable.*

As expected based on the ANOVA, participant sex was not found to be a significant predictor of crying proneness in participants younger than 11 years and neither were reappraisal, externalising blame, shame, guilt and parental overprotection. Suppression was found to be associated with a very large increase in the frequency with which this younger sample reported feeling like crying ‘every day’. Younger participants reported feeling like crying ‘many days’ less frequently when they had a high level of

parental care. Both of these effects were only found in one crying category. In contrast, high levels of empathy were associated with increases in participants selecting both ‘many days’ and ‘every day’.

Table 3.3.

Percentage converted relative risk ratios of predictor variables entered into the regression models for the participants 11 years old or older, split by sex with feeling like crying as the outcome variable.

Predictor Variable	Females		Males	
	Many Days	Every Day	Many Days	Every Day
Empathy	+8%*	+9%*	+9%*	+3%
Reappraisal	-5%	-13%*	-6%	-22%*
Suppression	+9%*	+11%	+5%	+5%
Shame	+6%*	+5%*	+3%	+1%
Guilt	-2%	-2%	+3%	+4%
Externalizing Blame	+2%	+1%	-4%	+4%
Parental Care	-4%*	-11%*	-4%	-7%
Parental Overprotection	+2%	+1%	+1%	-1%

*Note: Significance of predictor ($p < .05$) in the model is denoted by an *; percentages above can be understood as the increase or decrease in chance of participants selecting feeling like crying “many days” or “every day” as compared with “few days” for each unit increase on the predictor variable.*

As can be seen in Table 3.3, empathy was a significant predictor of a greater proneness to feeling like crying in older female participants but for older male participants the findings were less clear, with only ‘many days’ significantly greater than

‘few day’. Higher scores for the emotion regulation strategy of reappraisal were related with a decreased chance of participants selecting feeling like crying ‘every day’ regardless of sex, while higher suppression was only related to an increase in female participants reporting ‘many days’. Similarly, shame and parental care were only significant in predicting female responses. Female participants were more likely to report feeling like crying ‘many days’ and ‘every day’ at higher levels of shame. Conversely, higher reported levels of parental care were associated with a decreased frequency of female participants reporting feeling like crying. Guilt and parental overprotection were not significant predictors of feeling like crying for either sex.

3.8. Discussion

This study revealed that males and females were equally prone to feel like crying at ages 9 or 10 years but their crying behaviour diverged significantly by age 11 years. The crying behaviour of younger participants was broadly similar to that which has been noted in infants with feeling like crying being related to empathy (Sagi & Hoffman, 1976) and parental care (Bell & Ainsworth, 1972). Participants 11 years and older displayed more complex adult-like crying behaviour. That is, females were more prone to feel like crying than males (Lombardo et al., 2002; Peter et al., 2001), and there were complex relationships between crying behaviour and tendencies towards shame, responses to social situations, and emotion regulation strategies that are consistent with previous theorising on crying behaviour (Hendriks, Nelson, Cornelius, & Vingerhoets, 2008; Rottenberg & Vingerhoets, 2012).

It was hypothesised that female participants would report a greater propensity to feel like crying than males, with the divergence increasing with age. The results of the present study suggest that sex differences in crying behaviour begin at age 11 years and remain significant through to 14 years. Before the age of 11 years, males’ and females’

propensity to feel like crying did not differ significantly. This adds to the findings of Jellesma and Vingerhoets (2012) who observed that the sexes differ significantly in both their crying frequency and proneness when considered as a group from 9 to 13 years. Additionally, Van Tilburg et al. (2002) studied young people between the ages of 11 and 16 years and found that the difference in crying between the sexes was present at age 11. However, because their sample did not include younger participants, they were unable to determine whether the observed sex difference began at 11 years or earlier. The current study substantially contributes to the body of knowledge regarding crying behaviour by clarifying uncertainty in the literature about when sex differences in crying first occur.

Literature on infant crying informed predictions on the relationship between parenting style and crying behaviour; children and adolescents were expected to be less prone to crying when they had a history of caring parenting (Bell & Ainsworth, 1972). Interestingly, this hypothesis was only partially supported with parental care relating to feeling like crying less frequently for younger adolescents and older females but not older males. Adult males are known to cry less frequently than females (Lombardo et al., 2002; Peter et al., 2001) which may suggest that they are using different regulation strategies to handle difficult feelings in place of crying (Nolen-Hoeksema & Aldao, 2011). For example, they might use aggression as a way of expressing their sad and angry emotions (Zeman & Shipman, 1996).

It was hypothesised that a lower capacity to regulate emotions via the reappraisal emotion regulation strategy and higher reported use of the suppression strategy would be correlated with a higher crying proneness (Ardana et al., unpublished manuscript; Vingerhoets et al., 2000). This hypothesis was partially supported with reappraisal found to be significantly associated with a reduced probability of feeling like crying 'every day' for older participants but not for young participants. Higher suppression, however, was

found to be significantly related to younger participants selecting 'every day' and older female participants selecting 'many days' but it had no significant relationship to the choices of older males. Of note is the markedly stronger relationship between suppression and crying proneness in younger participants, with each increase of 1 point on the measure of suppression leading to a 39% increase in chance of younger participants selecting feeling like crying 'every day'. These results indicate that younger participants (under the age of 11 years) may have been using a more immature form of emotion regulation and that older participants may have been expressing a more mature form of emotion regulation which minimises the necessity for crying. This explanation links with the view of adolescence as a period of transition between child and adult behaviours (Yurgelun-Todd, 2007). Primarily children cry to get help when they are distressed (Bell & Ainsworth, 1972; Zeman & Shipman, 1996), a form of external emotion regulation, whereas adults are better able to regulate their emotions autonomously (Maas et al., 2011). Conceptualizing adolescence as a period where behaviours develop from child-like to more adult, it is reasonable to conclude that crying in adolescents is a way of asking for help when internal emotion regulation strategies fail.

Based on previous literature on self-conscious emotions, guilt, shame and blame were expected to correlate with crying proneness of participants, with different responses expected for younger participants, older females and older males (Eisenberg, 2000). The results of the present study did not fully support this hypothesis, with only shame being significantly related to crying behaviour and only in older female participants. Of note, the way in which these subtly different secondary emotions relate to sex highlights the wide ranging impact of sex differences in crying.

Van Tilburg et al. (2002) found that empathy was positively correlated with crying proneness and frequency, and so it was hypothesised in the present study that

increased empathy would be correlated with more frequently feeling like crying. Indeed, young participants were more likely to report feeling like crying both ‘many days’ and ‘every day’ if they were more empathetic, but the result was more complex for older participants. Empathy was correlated with females reporting feeling like crying both ‘many days’ and ‘every day’, but it was only related to the higher frequency of ‘many days’ for males. This study demonstrated that empathy was an important factor in understanding the crying proneness of both genders as evidenced by the significant positive relationships between high empathy in both genders and the frequency with which they felt like crying ‘many days’. Moreover, the sex difference in the relationship between empathy and feeling like crying ‘every day’ supports the suggestion that empathy is more important in the crying behaviour of females than males (Van Tilburg et al., 2002). These results suggest that empathy plays a less important role in the crying behaviour of males as they get older, which may be due to sexed peer pressure or related parental socialisation into lower levels of empathy (Jellesma & Vingerhoets, 2012; Nelson, 1998; Zeman & Shipman, 1996).

The present results come with certain caveats. In particular, the crying construct was assessed by a single item on the CDI. This item has three alternative levels of crying: feeling like crying ‘once in a while’, ‘many days’ or ‘every day’. The item is missing an option to suit participants who do not feel like crying or feel like crying less than ‘once in a while’. There was a large floor effect in the data where feeling like crying ‘once in a while’ was selected substantially more than the two higher options. This floor effect was addressed by using logistic regression to analyse the data but a measure with a greater potential for normal distribution would enable more sensitive and perhaps more accurate analysis. It should also be noted that the measure used here is an indirect measure of crying behaviour which relates to how prone individuals are to cry rather than how

frequently or intensely they actually cried. It is possible that the relationship between actually crying and the variables studied may differ to the result here despite the close relationship between feeling like crying and crying (Kraemer & Hastrup, 1986). In addition, more comprehensive measures of crying behaviour than those used in the present study would allow for a more thorough consideration of how individual differences relate to crying in childhood and adolescence. This might involve measures which record each crying event separately and measure its intensity. Ideally, questions about crying behaviour would be answered directly after the behaviour occurs, to avoid hindsight bias. Finally, it should also be noted that, though the finding that crying proneness differed significantly between participants younger than 11 from those aged 11 or older, it implies a stepwise change from child-like to more adult behaviour and this may be an artefact of statistical analysis with the change actually occurring more gradually.

Future research into crying behaviour would benefit from using a more direct measure of crying behaviour and from taking a broader lifespan approach. Most existing studies have included restricted age groups and there is a conspicuous lack of studies which span the boundaries of these categories. Further, given that studies include different personality or contextual factors, or ways of measuring the same constructs across age groups, it is difficult to compare them to gain a larger picture of how crying behaviour develops with age.

The present study suggests that adolescence is a developmental stage wherein crying behaviour and its correlates change substantially. It is the first study to detect a point of divergence in sexed crying behaviour: there is a significant difference in the frequency of feeling like crying before and after age 11 years. Before the age of 11, crying behaviour was related to empathy, parental care and the use of suppression, while the crying

behaviour of participants aged 11 or older depended on sex and included responses to empathy, shame, parental care and the use of both reappraisal and suppression as emotion regulation strategies. The results implicate crying as an emotion regulation strategy and shed light on some of the proposed functions and causes of crying behaviour. Together, the results of the present study go some way to filling vital developmental gaps in our understanding of crying and provide a strong foundation for further inquiry into childhood and adolescent tears.

3.9. References

- Ardana, H., Whelan, T., & Melvin, G. (unpublished manuscript). Crying behaviour in adolescence: Gender, mood and emotion regulation. *In Prep.*
- Becht, M. C., & Vingerhoets, A. J. J. M. (2002). Crying and mood change: A cross-cultural study. *Cognition & Emotion*, *16*(1), 87–101.
- Bell, S. M., & Ainsworth, M. D. S. (1972). Infant crying and maternal responsiveness. *Child Development*, *43*(4), 1171–1190.
- Bryant, B. (1982). An index of empathy for children and adolescents. *Child Development*, *53*(2), 413–425.
- Bylsma, L. M., Croon, M. a., Vingerhoets, A. J. J. M., & Rottenberg, J. (2011). When and for whom does crying improve mood? A daily diary study of 1004 crying episodes. *Journal of Research in Personality*, *45*(4), 385–392.
- Bylsma, L. M., Vingerhoets, A. J. J. M., & Rottenberg, J. (2008). When is crying cathartic? An international study. *Journal of Social and Clinical Psychology*, *27*(10), 1165–1187.
- Campbell, D. W., & Eaton, W. O. (1999). Sex differences in the activity level of infants. *Infant and Child Development*, *8*, 1–17.
- Cooper, C. R., Grotevant, H. D., & Condon, S. M. (1983). Individuality and connectedness in the family as a context for adolescent identity formation and role-taking skill. In H. D. Grotevant & C. R. Cooper (Eds.), *Adolescent development in the family* (pp. 43–59). San Francisco: Jossey-Bass.
- Eisenberg, N. (2000). Emotion, regulation, and moral development. *Annual Review of Psychology*, *51*, 665–697.
- Frey, W. H., & Langseth, M. (1985). *Crying: The mystery of tears*. Minneapolis: Winston Press.

Gross, J. J. (1998). The emerging field of emotion regulation: An integrative review. *Review of General Psychology*, 2(3), 271–299.

Gross, J. J. (2002). Emotion regulation: Affective, cognitive, and social consequences. *Psychophysiology*, 39(3), 281–91.

Gross, J. J., & John, O. P. (2003). Individual differences in two emotion regulation processes: Implications for affect, relationships, and well-being. *Journal of Personality and Social Psychology*, 85(2), 348–362.

Gullone, E., Hughes, E. K., King, N. J., & Tonge, B. (2010). The normative development of emotion regulation strategy use in children and adolescents: A 2-year follow-up study. *Journal of Child Psychology and Psychiatry, and Allied Disciplines*, 51(5), 567–74.

Gullone, E., & Taffe, J. (2012). The Emotion Regulation Questionnaire for Children and Adolescents (ERQ-CA): A psychometric evaluation. *Psychological Assessment*, 24(2), 409–17.

Gyurak, A., Gross, J. J., & Etkin, A. (2011). Explicit and implicit emotion regulation: a dual-process framework. *Cognition & Emotion*, 25(3), 400–12.

Hendriks, M. C. P., Nelson, J. K., Cornelius, R. R., & Vingerhoets, A. J. J. M. (2008). Why crying improves our well-being: An attachment-theory perspective on the functions of adult crying. In A. J. J. M. Vingerhoets, I. Nyklíček, & J. Denollet (Eds.), *Emotion Regulation* (pp. 87–96). New York: Springer.

Herz, L., & Gullone, E. (1999). The relationship between self-esteem and parenting style: A cross-cultural comparison of Australian and Vietnamese Australian adolescents. *Journal of Cross-Cultural Psychology*, 30(6), 742–761.

Hill, P., & Martin, R. B. (1997). Empathic weeping, social communication, and cognitive dissonance. *Journal of Social and Clinical Psychology*, 16(3), 299–322.

Jellesma, F. C., & Vingerhoets, A. J. (2012). Crying in middle childhood: A report on gender differences. *Sex roles, 67*(7-8), 412-421.

Kovacs, M., & Staff, M. (2003). Children's Depression Inventory (CDI): Technical manual update. North Tonawanda: *Multi-Health System*.

Kraemer, D. L., & Hastrup, J. L. (1986). Crying in natural settings: Global estimates, self-monitored frequencies, depression and sex differences in an undergraduate population. *Behaviour Research and Therapy, 24*(3), 371-3.

Laan, A. J., van Assen, M. A. L. M., & Vingerhoets, A. J. J. M. (2012). Individual differences in adult crying: The role of attachment styles. *Social Behavior and Personality: An International Journal, 40*(3), 453-471.

Lombardo, W. K., Cretser, G. A., & Roesch, S. C. (2002). For crying out loud- the differences persist into the '90s. *Sex Roles, 45*, 529-547.

Maas, J., Laan, A., & Vingerhoets, A. J. J. M. (2011). Attachment, emotion regulation and adult crying. In I. Nyklíček, A. Vingerhoets, & M. Zeelenberg (Eds.), *Emotion regulation and well-being* (pp. 181-195). New York: Springer New York.

Miceli, M., & Castelfranchi, C. (2003). Crying: Discussing its basic reasons and uses. *New Ideas in Psychology, 21*(3), 247-273.

Nelson, J. K. (1998). The meaning of crying based on attachment theory. *Clinical Social Work Journal, 26*(1), 9-22.

Nolen-Hoeksema, S., & Aldao, A. (2011). Gender and age differences in emotion regulation strategies and their relationship to depressive symptoms. *Personality and Individual Differences, 51*(6), 704-708.

Parker, G., Hadzi-Pavlovic, D., Greenwald, S., & Weissman, M. (1995). Low parental care as a risk factor to lifetime depression in a community sample. *Journal of Affective Disorders, 33*, 173-180.

Parker, Tupling, & Brown. (1979). A Parental Bonding Instrument. *British Journal of Medical Psychology*, 52, 1–10.

Peter, M., Vingerhoets, A. J., & Van Heck, G. L. (2001). Personality, gender, and crying. *European Journal of Personality*, 15(1), 19-28.

Rottenberg, J., Bylsma, L. M., & Vingerhoets, A. J. J. M. (2008). Is crying beneficial? *Current Directions in Psychological Science*, 17(6), 400–404.

Rottenberg, J., Bylsma, L. M., Wolvin, V., & Vingerhoets, A. J. J. M. (2008). Tears of sorrow, tears of joy: An individual differences approach to crying in Dutch females. *Personality and Individual Differences*, 45(5), 367–372.

Rottenberg, J., Cevaal, A., & Vingerhoets, A. J. J. M. (2008). Do mood disorders alter crying? A pilot investigation. *Depression and Anxiety*, 25(5), E9–15.

Rottenberg, J., & Vingerhoets, A. J. J. M. (2012). Crying: Call for a lifespan approach. *Social and Personality Psychology Compass*, 6(3), 217–227.

Sagi, A., & Hoffman, M. L. (1976). Empathic distress in the newborn. *Developmental Psychology*, 12(2), 175–176.

Sitarenios, G., & Stein, S. (2004). Use of the Children's Depression Inventory. In M. E. Maruish (Ed.), *The use of psychological testing for treatment planning and outcomes assessment: Vol 2* (3rd ed., pp. 1–37). Mahwah, NJ: Erlbaum.

Soltis, J. (2004). The signal functions of early infant crying. *Behavioral and Brain Sciences*, 27(04), 443-458.

SPSS Inc. (2011). IBM Corp. Released 2011. IBM SPSS Statistics for Windows, version 20.0. Armonk, NY: *IBM Corp.* Chicago, IL: SPSS inc.

Tangney, J. P., & Dearing, R. L. (2002). *Shame and guilt*. New York: Guilford Press.

Tangney, J. P., Wagner, P. E., Barlow, D. H., Marschall, D. E., & Gramzow, R. (1996). The relation of shame and guilt to anger and self-reported aggression. *Journal of Personality and Social Psychology, 70*(4), 797.

Tangney, J. P., Wagner, P. E., Gavlas, J., & Gramzow, R. H. (1991). *The Test of Self Conscious Affect for Adolescents (TOSCA-A)*. Fairfax, VA: George Mason University.

Van Ijzendoorn, M., & Hubbard, F. (2010). Are infant crying and maternal responsiveness during the first year related to infant-mother attachment at 15 months? *Attachment & Human Development, 2*(3), 371–391.

Van Tilburg, M. A. L., Unterberg, M. L., & Vingerhoets, A. J. J. M. (2002). Crying during adolescence: The role of gender, menarche, and empathy. *British Journal of Developmental Psychology, 20*(1), 77–87.

Vingerhoets, A. J. J. M., Cornelius, R. R., Van Heck, G. L., & Becht, M. C. (2000). Adult crying: A model and review of the literature. *Review of General Psychology, 4*(4), 354–377.

Yurgelun-Todd, D. (2007). Emotional and cognitive changes during adolescence. *Current Opinion in Neurobiology, 17*(2), 251–7.

Zeman, J., & Shipman, K. (1996). Children's expression of negative affect: Reasons and methods. *Developmental Psychology, 32*(5), 842–849.

Chapter 4: A Study of Crying Behaviour in Adolescence using a Daily Diary

4.1 Preamble to empirical paper.

This chapter presents empirical data and provides descriptive information about the crying behaviours displayed by its adolescent sample. This chapter also demonstrates and discusses a methodology of collecting information on adolescent crying episodes which allows for more detailed information to be collected than with the standard survey. Herein is reported the second study to use a daily diary to record information on crying behaviour and the first to do so on a sample which includes either males or adolescent participants. It also provides basic but valuable information regarding the frequency with which both genders cry along with the mood ratings associated with crying behaviour in both genders. This constitutes a substantial contribution to the literature on crying behaviour.

The chapter was submitted, as an article, to *Comprehensive Psychiatry* on the 19th of January, 2015. *Comprehensive Psychiatry* is an international journal which publishes advancements in basic investigations in psychiatry and psychology among other topics. The journal has an impact factor of 2.256. This chapter has been formatted in accordance with the style specified by the editorial board of this journal.

Monash University

4.2 Declaration of thesis chapter 4

In the case of chapter 4, the nature and extent of my contribution to the work was the following:

Nature of contribution	Extent of contribution
Literature review, project design, data collection, data analysis and writing of paper.	70%

The following co-authors contributed to the work. If co-authors are students at Monash University, the extent of their contribution in percentage terms must be stated:

Name	Nature of contribution	Extent of contribution (%) for student co-authors only
Dr Glenn Melvin	Contributed to study design, data collection input, review of manuscript drafts and general supervisory input.	
Dr Eleonora Gullone	Contributed to study design, data collection input, review of manuscript drafts and general supervisory input.	
Dr Tom Whelan	Contributed to study design, data collection input, review of manuscript drafts and general supervisory input.	

The undersigned hereby certify that the above declaration correctly reflects the nature and extent of the candidate's and co-authors' contributions to this work.

Candidates Signature

Date

Main Supervisor's Signature

Date

4.3 Title Page

Title

A Study of Crying Behaviour in Adolescence using a Daily Diary

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4.4. Abstract

The emerging field of crying research has been hampered by a reliance on retrospective self-report data and recent reports have highlighted the lack of data for certain developmental phases, including adolescence. This paper utilised data from a novel 'crying diary' to examine its utility as a method of behavioural data collection and to investigate the context and frequency of adolescent crying. On the basis of 215 crying episodes from 42 participants (69% female) aged between 12 and 18 years, it was found that male and female adolescents differed significantly on a range of indices of crying behaviour including crying frequency, emotional context of crying episode, and crying in response to pain. Of note, male and female participants did not differ in terms of how often they attempted to regulate their crying. Suggestions for the use of this methodology in future crying research and other low frequency behaviours are offered.

4.5. Keywords

Crying; Adolescence; Diary; Emotion

4.6. Introduction

Crying, the act of shedding tears or ‘welling up’ in the absence of a physical irritant, is a fundamental human behaviour that occurs across all studied cultures and throughout the lifespan. Crying is implicated in clinical disorders such as depressive disorder (Vingerhoets, Rottenberg, Cevaal, & Nelson, 2007) and has received great interest from the non-scientific community. Nevertheless, little research has explored its development or function (Rottenberg, Bylsma, & Vingerhoets, 2008; Vingerhoets, Cornelius, Van Heck, & Becht, 2000). Of the limited studies to date, many rely on retrospective surveys involving adults (De Fruyt, 1997; Peter, Vingerhoets, & Van Heck, 2001; Rottenberg, Cevaal, & Vingerhoets, 2008) with few exploring other developmental periods.

One developmental period which has received little attention is adolescence, with only two key published papers exploring crying in this age group (Santiago-Menendez & Campbell, 2013; Van Tilburg, Unterberg, & Vingerhoets, 2002). Adolescence is a period of rapid emotional and cognitive development, allowing it to provide vital information about how the function and characteristics of crying change from an attachment focussed behaviour in infancy to a more complex, sex differentiated phenomena in adulthood (De Fruyt, 1997; Lombardo, Cretser, & Roesch, 2002; Peter et al., 2001). Given their level of emotional and cognitive development, adolescents are more capable of engaging in self-reflection than children, allowing them to provide deeper insights into crying behaviour than is possible in earlier developmental groups.

A recent innovation in crying research has been the use of a crying diary (Bylsma, Croon, Vingerhoets, & Rottenberg, 2011). Daily diaries of mood and behaviour have been used with high return rates and little missing data for both adults (Fals-Stewart, 2003; Sherliker & Steptoe, 2000; Sonnentag, 2001) and young children (Gil et al., 2010; Schanberg et al., 2000). Importantly, research utilising diaries has allowed studies to

measure co-occurring behaviours and moods (Fals-Stewart, 2003; Sonnentag, 2001) and longitudinal outcomes (Schanberg et al., 2000; Sherliker & Steptoe, 2000). Such investigations would not be possible with data collected using longer periods of retrospection so the diary format allows for an examination of crying behaviour in far greater depth.

The aims of the present paper are to establish a method for more accurate and detailed investigation into crying behaviour and to provide formative data on the characteristics of crying in adolescence. It was hypothesised that there would be significant sex differences in the characteristics of crying as found in adulthood. Specifically, it was hypothesised that females would cry more frequently than males and that there would be differences between the sexes in terms of the emotions, locations and company associated with crying as well as the circumstances in which it was suppressed.

4.7. Methods

Participants

Data were collected from 42 participants aged between 12 and 18 years. Of the participants, 29 were females (mean age 16.14, $SD=1.58$) and 13 were male (mean age 14.91, $SD=1.80$). Participants were primarily recruited through advertising on community websites, and engagement of community groups such as sporting organizations. The return rate of diaries from participants was 75% (42/56; females 81%, males 65%). Across all diaries returned, data were missing in only 4% of crying episodes. In total, this yielded detailed information about 215 crying episodes.

Materials

This study utilised a novel Adolescent Crying Diary modelled on the diary used by Bylsma, Croon, Vingerhoets, and Rottenberg (2011) in their investigation of adult crying and mood change. This diary (Bylsma et al., 2011) was shown to have a high

condition, mental condition, and a combination of causes/other reason (Bylsma et al., 2011).

The present study made four main changes to the crying diary created by Bylsma et al. (2011). First, the wording of the diary was adapted for the adolescent developmental stage. The list of mood indicators was altered in line with conceptualizations of crying and based on adolescent scales of emotion (Tangney & Dearing, 2002). It included calm, joyful, fearful, restless, and bad tempered and excluded cheerful, angry, emotionally stable and irritable (Labott & Martin, 1988; Miceli & Castelfranchi, 2003). The scale rating 'urge to cry' was reworded to 'ready to cry' and an additional item asking how many times the participant cried that day was added. This version of the diary also asked for more information about the context of the crying episode by asking who was present, rather than just how many people were present.

Second, the crying behaviour of females at different stages of their menstrual cycle was assessed. To accommodate this, a separate version of the diary was created for females which added two questions investigating whether the participant was currently menstruating or experiencing pre-menstrual tension.

Third, a section to describe attempts to control crying behaviour was added to the adolescent diary. This section asked participants whether they attempted to stop themselves from crying and why they did so, presenting four options and two spaces for participants to specify other reasons. The options were: 'you thought crying would be a silly or weak thing to do', 'you were worried that others might think you're silly or weak for crying', 'you didn't want others to know that you were sad/upset' and 'you didn't want to upset someone you were with'.

Finally, the section detailing reasons for crying was adapted to allow the adolescents to provide more nuanced responses. That is, the participants rated the contribution

towards their crying episode for each proposed reason for crying on a 7-point scale. Also, space was provided for participants to specify other reasons. The list of reasons available was altered to include personal rejection, negative thoughts about myself, negative thoughts about others, sadness, happiness, relief, fear, anger, pity, hopelessness, guilt, pride, powerlessness, sorry for myself, loneliness, inspiration, stress, feeling unable to control your feeling(s). The response options “mental condition” and “combination of causes/other reason” were excluded from the adolescent diary.

After these changes, the provisional draft was piloted with several adolescents aged between 12 and 16 years to confirm the suitability of the wording. This piloting process revealed no barriers to understanding the diary. The content validity of the model was checked by 3 psychologists with clinical and research experience.

Procedure

Following ethics approval from the Monash University Human Research Ethics Committee, participants were contacted in person, via email or through advertisements placed in community areas including the Monash University online newsletter, youth centres, and sporting clubs. The diary was mailed to participants with an expectation that they would spend approximately 2 minutes per day filling it out on days when they did not cry and approximately 10 minutes per day on days that they did cry, with participation lasting 42 continuous days. Reminder text messages and emails sent at a rate of 1-2 a week were available to participants who nominated to receive them on the consent form. Upon completion of the diary, participants were reimbursed \$40 for their time.

4.8. Results

Descriptives of Adolescent Crying

The number of times female participants reported crying during the 42 day period ranged from 0 to 51 with the mean being 11.31 ($SD=12.37$). For males, the number of

cries reported ranged from 0 to 11 with a mean of 3.08 ($SD=3.12$). Of the sample, 10% ($n=3$) of female and 39% ($n=5$) of male participants did not cry at all during the recording period. To provide a comparison between the crying frequency of the current sample and that of an adolescent sample using the Adult Crying Inventory (ACI; Van Tilburg et al., 2002), scores derived from the data collected using retrospective survey and relating to the same time period (4 weeks) were entered into single sample t-tests as population means (female value: 3.86, male value: 1.40). When correcting for the different time periods sampled, the average number of cries recorded with the diary was significantly higher than previously found using the ACI for females ($t(28)=2.15, p<.05$) but not for males ($t(12)=1.98, p>.05$).

Table 4.1 contains the average number of cries, number of days on which crying occurred, number of days on which participants tried to stop from crying as well as how frequently crying was due to physical condition or pain or positive experiences, for males and females separately. Significance values are also presented for each comparison.

The results in Table 4.1 show that males cried less frequently than females and that a far greater proportion of their crying episodes were due to pain or a physical condition. Interestingly, the proportion of crying episodes that males and females tried to stop was equivalent.

Crying and the Menstrual Cycle

A chi-squared test of independence considering female participant menstruation and non-menstruation compared with whether they cried or not, was significant ($X^2=27.05, p<.001$). There were a higher proportion of days on which female participants cried when menstruating (46 days on which crying occurred out of 159, 29%), when compared with

non-menstruating days (136 days out of a 1042, 13%). Female participants were more than twice as likely to cry on a day on which they reported menstruating.

Situational Context of Crying Episodes

To examine the situational context in which crying occurred, the percentage of crying episodes occurring in different contexts was calculated. Table 4.2 shows, for each sex, how many times certain people were present during a crying episode, as a percentage of the total number reported in addition to typical locations for crying episodes.

Table 4.1.

Crying episodes, crying days, days on which participants tried to stop from crying and cries due to pain or physical condition, presented by sex.

	Females <i>n</i> =29 <i>m(sd/n(%))</i>	Males <i>n</i> =13 <i>m(sd/n(%))</i>	<i>t</i> -Test of difference <i>p</i> values
No. of cries	10.72 (12.55)	3.08 (3.25)	<i>p</i> =.038
No. of days with crying episode	5.86 (4.96)	2.46 (2.33)	<i>p</i> =.024
No. of days participants tried to stop crying	5.34 (5.30)	2.92 (5.01)	<i>p</i> =.127
Cries due to pain or physical condition	39 (16.9%)	15 (42.8%)	<i>p</i> =.003
Cries due to a positive experience	22 (8.1%)	5 (16.2%)	<i>p</i> =.63

Note: Mean values are presented for all, standard deviation is presented for number of cries, number of days with crying episodes and number of days participants tried to stop crying

Table 4.2.

Location of cries presented as percentages of total crying episodes and number of times people were reported as present during a cry, presented as percentages of total crying episodes by sex.

	Females	Males
Who was present?	<i>n</i> (%)	<i>n</i> (%)
Mother	56 (32%)	13 (41%)
Father	8 (5%)	8 (25%)
Siblings	24 (14%)	11 (34%)
Other Family (e.g., grandparents, aunt, uncle)	10 (6%)	2 (6%)
Friends	25 (14%)	3 (9%)
Other Peers (e.g., sports team, class mates)	7 (4%)	1 (3%)
Alone	72 (41%)	11 (34%)
Other (e.g., doctor, school chaplain, strangers)	16 (9%)	0 (0%)
Where did the cry occur?		
Bedroom	47 (27%)	10 (31%)
Other rooms at home	71 (41%)	13 (41%)
School	20 (11%)	3 (9%)
Car	10 (6%)	0 (0%)
Outside	2 (1%)	3 (9%)
Other (e.g., funeral, tennis court, church, movies)	25 (14%)	3 (9%)

As indicated in Table 4.2, females and males named their mother as the most likely person to be present for a crying episode, but also reported many cries with no one present. Males, however, had much larger proportions of crying episodes in the presence

of their fathers and siblings than did females. For both sexes, over 70% of crying episodes occurred while at home, whether in the bedroom or another room of the house with the next highest proportion occurring at school.

Emotional Experience and Incidence of Crying

Two multiple regressions investigated whether reported emotions (i.e., nervous, cheerful, angry, relaxed, restless, tense, sad, anxious, emotionally stable, and irritable) on each day were predictive of crying. Basic descriptive statistics for all emotions can be found in Appendix S, Tables S.1 (female) and S.2 (male). Female participants were significantly more likely to cry [$F(10,1189)=37.21, p<.001$] if they felt sad [$\beta=.45$] and less likely to cry if they felt fearful [$\beta=-.10$]. Male participants were also more likely to cry [$F(10,532)=1.87, p<.05$] if they felt sad [$\beta=.14$] but were less likely to cry if they felt restless [$\beta=-.18$].

A similar regression determined if reported emotions (i.e., nervous, cheerful, angry, relaxed, restless, tense, sad, anxious, emotionally stable, and irritable) could predict whether or not participants tried to stop themselves from crying. Mood rating significantly predicted females [$F(10,1189)=34.89, p<.001$] and males [$F(10,532)=4.71, p<.001$] trying to stop from crying. Females were more likely to try to stop themselves crying if they were sad [$\beta=.40$], irritated [$\beta=.09$], or nervous [$\beta=.11$] and less likely to try to stop themselves crying if they were fearful [$\beta=-.09$]. Males were more likely to try to stop themselves crying if they felt bad tempered [$\beta=.30$] and less likely to if they felt restless [$\beta=-.14$].

Table 4.3 shows how frequently participants nominated each of the five designated reasons for trying to stop themselves from crying: ‘you thought crying would be a silly or weak thing to do’, ‘you were worried that others might think you’re silly or weak for crying’, ‘you didn’t want others to know that you were sad/upset’ and ‘you didn’t want to

upset someone you were with' and 'other'. To better understand these behaviours, the responses are separated by gender.

Table 4.3.

Number of times participants reported various reasons for trying to stop themselves from crying.

	Females	Males
	<i>n (%)</i>	<i>n (%)</i>
You thought crying would be a silly or weak thing to do	64 (40%)	31 (81%)
You were worried that others might think you're silly or weak	55 (35%)	12 (32%)
You didn't want others to know that you were sad/upset	91 (58%)	8 (21%)
You didn't want to upset someone you were with	43 (27%)	3 (8%)
Other reasons	42 (27%)	4 (11%)

For females, wanting to hide their feelings was the most frequently chosen reason for attempting to stop crying while, for males, it was the belief that crying would be a silly or weak thing to do. The vast majority of responses in the 'other reasons' category were similar to offered answers and were seemingly entered to clarify the specific nature of why a participant thought crying would be weak or perceived as silly by others (e.g., "I was at work").

4.9. Discussion

The results strongly support the hypothesis that males and females differ on indices of crying behaviour. It was found that female participants cried more often and in relation to different emotions, and tried to stop from crying for different reasons than male

adolescents. This indicates that the sex differences documented for adult crying (De Fruyt, 1997; Lombardo et al., 2002; Peter et al., 2001) are also evident in adolescents.

Notably, there was no significant difference in the number of days on which males and females reported trying to stop themselves crying. Given the far lower crying frequency of males, this may indicate that males have a similar propensity to cry as females during adolescence but are much more likely to suppress the behaviour. Previous research suggests that people may suppress crying behaviour for both interpersonal reasons, such as avoiding attention and stopping people from seeing them in a bad light, and intrapersonal reasons, such as avoiding negative emotion or avoiding seeing themselves in a bad light. Interestingly, female participants have been reported to be more likely to identify inter-personal motives and male participants intra-personal motives (Simons, Bruder, van der Löwe, & Parkinson, 2013). The tendency for males to view crying intra-personally, as a weakness, is consistent with the proverb “big boys don’t cry” and suggests this socialized view of male crying has been internalized strongly by males in adolescence. The present study provides evidence that males and females may suppress crying for different reasons. Future research regarding males and females inter- or intra-personal reasons for crying could shed light on the sex difference in crying behaviour.

In the present investigation, both sexes cried most frequently when alone or when in the presence of their mothers. However, there were a significantly higher proportion of male crying episodes in the presence of fathers. This result is particularly interesting as previous research has indicated that male adolescents are less likely to seek support from their fathers than from their mothers or peers (Youniss, 1987). This apparent difference may be related to the process of internalising the view that crying is a weak thing for males to do. Previous research suggests that males feel more judged by their fathers than their mothers which may be partially due to their fathers’ role in internalising the negative

associations with male crying (Von Salisch, 2001). Future research would benefit from investigating the role of fathers in adolescent crying and, more generally, in emotional expression and experience, as it may offer insight into the development of sex differences.

The results also indicated that for females, feeling irritated, or nervous were uniquely indicative of trying to avoid crying while greater sadness and lower fear were predictors of increased crying proneness. For males, feeling bad tempered was uniquely related to trying to stop from crying while greater sadness and lower reported restlessness were predictive of crying proneness. Taken together, this is consistent with previous views on the relationship between emotions and crying (Efran & Spangler, 1979) which suggest that crying helps with emotional recovery.

The data also suggest that crying in response to positive factors has begun to develop by adolescence, earlier than was suggested in the review by Rottenberg and Vingerhoets (2012), perhaps indicating that the cognitive capacity of adolescents allows them to reflect on the sometimes conflicted nature of success (e.g., graduation from school not just leading to new opportunities but the loss of contact with previous experiences). Furthermore, despite earlier research indicating that the sex difference in adolescent crying frequency was not due to the onset of menarche (Van Tilburg et al., 2002), in the current study it was found that menstruation significantly increased the chance of adolescent girls crying on a given day, indicating that hormonal and psychosocial changes may have an impact on crying proneness.

The differences between the current data and previous literature may be due to the greater detail and depth of information gathered using the proximal crying diary as compared with retrospective surveys. It is certainly the case that information about the nature and context of individual crying episodes and related behaviour, such as trying to

stop oneself from crying, was able to be gathered in greater detail using the diary than is possible using surveys with longer timeframes for retrospection than just within a day. This, together with the high return rate of the diaries and high proportion of complete entries, suggests that this form of data collection is a viable and rich method for investigating crying behaviour in adolescents and older age groups.

It should be noted that, as the results of this paper are based on data gathered using a novel measure, the conclusions must be considered with reference to several limitations. As stated above, one section of the diary that was not answered as expected was the 'other' options for participants to provide reasons not otherwise listed for why they believe they tried to stop from crying. Most participants used this section to clarify another selected answer, potentially indicating they did not know how to classify their behaviour. In addition, the results of the present study cannot be considered normative values for adolescence due to the small participant numbers and partial use of convenience sampling. Future research can make use of a similar methodology to develop these norms and could extend the methodology into earlier developmental groups using parent elicitation. Further, other areas of investigation into infrequent human behaviours, such as truancy, interpersonal conflict and non-suicidal self-injury, could benefit from the use of a similar methodology to provide detail as to context and antecedents of these behaviours

This investigation of a daily diary in adolescents demonstrates potential for gathering rich, time sensitive information on infrequent behaviours and has yielded a wealth of information on adolescent crying. In particular, the evidence for sex differences in crying behaviour, impact of menstruation on crying incidence, and capacity of emotions to predict crying behaviour demonstrate the utility of this method. The discrepancies with

previous findings as well as new, unexpected results provide great scope for future research to explore the meaning and context of crying across the lifespan.

4.10. Acknowledgements

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4.11. References

- Bylsma, L. M., Croon, M. A., Vingerhoets, A. J. J. M., & Rottenberg, J. (2011). When and for whom does crying improve mood? A daily diary study of 1004 crying episodes. *Journal of Research in Personality, 45*(4), 385–392.
- De Fruyt, F. (1997). Gender and individual differences in adult crying. *Personality and Individual Differences, 22*(6), 937–940.
- Efran, J. S., & Spangler, T. J. (1979). Why grown-ups cry. *Motivation and Emotion, 3*(1), 63–72.
- Fals-Stewart, W. (2003). The occurrence of partner physical aggression on days of alcohol consumption: A longitudinal diary study. *Journal of Consulting and Clinical Psychology, 71*(1), 41–52.
- Gil, K. M., Porter, L., Ready, J., Workman, E., Sedway, J., & Anthony, K. K. (2010). Pain in children and adolescents with Sickle Cell Disease: An analysis of daily pain diaries. *Children's Health Care, 29*(4), 225-241.
- Labott, S. M., & Martin, R. B. (1988). Weeping: Evidence for a cognitive theory. *Monographs of the Society for Research in Child Development, 12*(3), 205–216.
- Lombardo, W. K., Cretser, G. A., & Roesch, S. C. (2002). For crying out loud- the differences persist into the '90s. *Sex Roles, 45*(7/8), 529–547.
- Miceli, M., & Castelfranchi, C. (2003). Crying: Discussing its basic reasons and uses. *New Ideas in Psychology, 21*(3), 247–273.
- Peter, M., Vingerhoets, A. J. J. M., & Van Heck, G. L. (2001). Personality, gender, and crying. *European Journal of Personality, 15*, 19-28.
- Rottenberg, J., Bylsma, L. M., & Vingerhoets, A. J. J. M. (2008). Is crying beneficial? *Current Directions in Psychological Science, 17*(6), 400–404.
- Rottenberg, J., Cevaal, A., & Vingerhoets, A. J. J. M. (2008). Do mood disorders alter crying? A pilot investigation. *Depression and Anxiety, 25*(5), E9–15.

Rottenberg, J., & Vingerhoets, A. J. J. M. (2012). Crying: call for a lifespan approach. *Social and Personality Psychology Compass*, 6(3), 217–227.

Santiago-Menendez, M., & Campbell, A. (2013). Sadness and anger: Boys, girls, and crying in adolescence. *Psychology of Men & Masculinity*, 14(4), 400–410.

Schanberg, L. E., Sandstrom, M. J., Starr, K., Gil, K. M., Lefebvre, J. C., Keefe, F. J., Affleck, G., & Tennen, H. (2000). The relationship of daily mood and stressful events to symptoms in juvenile rheumatic disease. *Arthritis Care and Research: The Official Journal of the Arthritis Health Professions Association*, 13(1), 33–41.

Sherliker, L., & Steptoe, A. (2000). Coping with new treatments for cancer: A feasibility study of daily diary measures. *Patient Education and Counseling*, 40(1), 11–9.

Simons, G., Bruder, M., van der Löwe, I., & Parkinson, B. (2013). Why try (not) to cry: Intra- and inter-personal motives for crying regulation. *Frontiers in Psychology*, 3, 597.

Sonnentag, S. (2001). Work, recovery activities, and individual well-being: A diary study. *Journal of Occupational Health Psychology*, 6, 196–210.

Tangney, J. P., & Dearing, R. L. (2002). *Shame and guilt*. New York: Guilford Press.

Van Tilburg, M. A. L., Unterberg, M. L., & Vingerhoets, A. J. J. M. (2002). Crying during adolescence: The role of gender, menarche, and empathy. *British Journal of Developmental Psychology*, 20(1), 77–87.

Vingerhoets, A. J. J. M., Cornelius, R. R., Van Heck, G. L., & Becht, M. C. (2000). Adult crying: A model and review of the literature. *Review of General Psychology*, 4(4), 354–377.

Vingerhoets, A. J. J. M., Rottenberg, J., Cevaal, A., & Nelson, J. (2007). Is there a relationship between depression and crying? A review. *Acta Psychiatrica Scandinavica*, *115*(5), 340–51.

Von Salisch, M. (2001). Children's emotional development: Challenges in their relationships to parents, peers, and friends. *International Journal of Behavioral Development*, *25*(4), 310–319.

Youniss, J. (1987). *Adolescent relations with mothers, fathers and friends*. Chicago, IL: University of Chicago Press.

Chapter 5: How Emotion Regulation and Social Support are associated with Adolescent Crying.

5.1 Preamble to empirical paper.

This chapter reports a study which empirically evaluates the usefulness of current crying hypotheses in explaining the crying behaviour of adolescents. Specifically, it examines the cathartic function of crying, the possibility to consider crying as a form of emotion regulation, as well as the impact of the social context in which crying occurs. Through consideration of these aspects of crying, this study contributes significantly to the understanding of crying behaviour.

The article was submitted to *Cognition and Emotion* on the 19th of January, 2015. *Cognition and Emotion* is an international journal which publishes theoretical papers, original research reports, and literature reviews on emotion with particular reference to related cognitive process. The journal has an impact factor of 2.311. This paper has been formatted in accordance with the style specified by the editorial board of this journal.

Monash University

5.2 Declaration of thesis chapter 5

In the case of chapter 5, the nature and extent of my contribution to the work was the following:

Nature of contribution	Extent of contribution
Literature review, project design, data collection, data analysis and writing of paper.	70%

The following co-authors contributed to the work. If co-authors are students at Monash University, the extent of their contribution in percentage terms must be stated:

Name	Nature of contribution	Extent of contribution (%) for student co-authors only
Dr Glenn Melvin	Contributed to study design, data collection input, review of manuscript drafts and general supervisory input.	
Dr Eleonora Gullone	Contributed to study design, data collection input, review of manuscript drafts and general supervisory input.	
Dr Tom Whelan	Contributed to study design, data collection input, review of manuscript drafts and general supervisory input.	

The undersigned hereby certify that the above declaration correctly reflects the nature and extent of the candidate's and co-authors' contributions to this work.

Candidates Signature

Date

Main Supervisor's Signature

Date

5.3 Title Page

Title

Why do we cry? A diary study of how emotion regulation and social support influence adolescent crying

Running Title

Why do adolescents cry?

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5.4. Abstract

Little research has been conducted into crying in adolescence despite possible insights about the development and function of crying. Similarly, conceptualizations of the functions of crying lack empirical evaluation. This study investigates emotion regulation and social conceptualizations of the function of crying using an adolescent sample. Results were obtained from 42 participants aged 12 to 18 who completed a daily diary of crying and mood. No analysis supported the social conceptualization of crying but the role of emotion regulation was strongly implicated. Participants reported mood improvement after crying in approximately one third of cases. Trying to stop oneself from crying lead females to increased feelings of sadness and nervousness and males to feel more restless and bad tempered, further implicating crying in the regulation of emotions. Overall, the results of this study support an emotion regulation and not social conceptualizations of crying in adolescence.

5.5. Key Words

Emotion regulation, social support, crying, theory, adolescence

5.6. Introduction

As noted by several investigators (e.g., Bylsma, Croon, Vingerhoets, & Rottenberg, 2011; Vingerhoets, Cornelius, Van Heck, & Becht, 2000), crying remains a poorly understood and understudied behaviour. Moreover, adolescence is a period of great emotional and cognitive development (Steinberg, 2005) yet very little research has explored adolescent crying. Given the emotional turbulence and development of interpersonal skills occurring in adolescence, conceptualizations which consider crying as a form of emotion regulation (Bylsma, Vingerhoets, & Rottenberg, 2008) or social communication (Cornelius & Labott, 2001; Hendriks, Croon, et al., 2008), may help explain adolescent crying behaviour.

Closely linked with the notion of catharsis (purging negative emotions), emotion regulation encompasses how well individuals are able to manage their emotional states as well as the strategies through which this is accomplished (Gross, 1998). Emotion regulation can involve explicit strategies which are actively engaged in and implicit strategies which are engaged in without conscious control (Thompson, 1994). According to Gross (1998), strategies can be considered either antecedent-focussed, changing the situation or the way it is perceived so that it is less upsetting, or response-focussed, aimed at altering the expression of emotions, depending on when during the process of emotional experience the strategies are utilised.

Crying can be considered a predominantly implicit strategy because it is not usually undertaken intentionally (Neu, 1987) and may be seen as either antecedent-focussed or response-focussed depending on the context. Bylsma et al. (2008) found that catharsis is greatest in people who cry in the presence of just one other person, indicating that crying can have an instrumental, antecedent focussed impact on a situation via increasing social support. Crying may also serve as a response-focussed strategy by leading directly to a cathartic release of negative emotion in the form of venting (Becht &

Vingerhoets, 2002; Bylsma et al., 2011, 2008). There is a posited relationship in adult samples between crying and mood change typified by the phrase “to have a good cry” (Becht & Vingerhoets, 2002; Bylsma et al., 2011; Hendriks, Nelson, Cornelius, & Vingerhoets, 2008), yet the way that mood alters after crying is still uncertain (Gračanin et al., 2014). Some studies with adults have found that people predominantly report mood improvement following a cry (Becht & Vingerhoets, 2002; Bylsma et al., 2011, 2008), while other studies report no mood change and some report worsening mood (Lombardo, Cretser, & Roesch, 2002).

This apparently contradictory result has been attributed to situational context (Bylsma et al., 2008). For example, the absence of mood improvement in laboratory studies is largely attributed to the lack of social support provided to participants. In contrast, when crying during everyday life, there can be significant social ramifications such as generating sympathy or gaining assistance for a difficult situation (Bylsma et al., 2008; Hendriks, Croon, et al., 2008; Maas et al., 2011) The possible social, help eliciting functions of crying in adolescence are as yet unstudied.

An alternative explanation for the variance in mood after crying relates to delay (Gračanin, Bylsma, & Vingerhoets, 2015). That is, the difference in findings may be attributed to differences in the time between crying and recording mood; new evidence suggests that crying may initially worsen mood but after time result in mood improvement relative to mood before crying (Gračanin et al., 2015).

The aim of the present study is to evaluate the role of crying in social support and emotion regulation via catharsis in adolescents. Studies regarding crying behaviour typically find a difference in the crying behaviour of males and females (Jellesma & Vingerhoets, 2012; Lombardo et al., 2002; Peter, Vingerhoets, & Van Heck, 2001; Van Tilburg, Unterberg, & Vingerhoets, 2002). Consequently, a sex difference is expected in

this study. It is expected that crying behaviour will display cathartic, emotion regulation properties both as reported by participants on the day of crying and as revealed by records of their mood over subsequent days. Specifically, it is hypothesised that crying behaviour will result in mood improvement, serving an emotion regulation function. It is hypothesised that mood improvement following crying is more likely in the presence of social support. In this case social support is considered to be highest in cases where only one other person is present (Bylsma et al., 2008).

5.7. Method

Participants

Participants were aged between 12 and 18 years and consisted of 29 females (mean age=16.14, $SD=1.58$) and 13 males (mean age=14.91, $SD=1.80$). Participants were recruited through advertisements on community websites, engagement of community groups and via word of mouth. In addition, some respondents were returning participants from a previous study, The Emotions Project (Gullone, Hughes, King, & Tonge, 2010; Gullone & Taffe, 2012).

Materials

This study utilised the Adolescent Crying Diary, a developmentally tailored version that was modelled on the Crying and Mood Diary created by Bylsma et al. (2011) in their investigation of the crying behaviour of adult females. The diary comprised 26 questions that were organised in four main sections: (1) mood ratings, (2) crying details, (3) details of attempts to avoid crying, and (4) factors contributing to the most intense cry.

The first section of the diary asked participants to rate their mood on 7-point Likert scales, from 1, 'not at all', to 7, 'very strongly', to represent how strongly they were feeling: relaxed, calm, sad, joyful, tense, fearful, restless, irritated, bad tempered, nervous, and ready to cry.

The second section comprised eight questions relating to their behaviour on each day. These included whether they had felt like crying, whether and how many times the participant had cried, where they were, who was present, how long and how intense the crying was and whether their mood or the situation was improved by crying.

Section 3 of the diary asked participants whether they attempted to stop themselves from crying and, if so, why they had resisted crying. The following 4 response options were provided: 'you thought crying would be a silly or weak thing to do', 'you were worried that others might think you're silly or weak for crying', 'you didn't want others to know that you were sad/upset', and 'you didn't want to upset someone you were with'. Participants could also nominate any additional reasons in an "other" option which was provided.

The fourth section of the diary asked participants to provide information about how much they believed a number of factors contributed to their crying episode. Participants were provided the opportunity to specify their own factors as well as to select from a list of factors provided as follows: conflict, loss, personal failure, personal rejection, witnessing suffering of others, positive experiences, physical condition or physical pain, negative thoughts about myself, negative thoughts about others, sadness, happiness, relief, fear, anger, pity, hopelessness, guilt, pride, powerlessness, sorry for myself, loneliness, inspiration, stress, and feeling unable to control your feeling(s). Each of these factors was rated on a 7-point Likert scale where participants indicated their intensity of feeling from 1, 'not at all', to 7, 'very strongly'.

Procedure

Following ethics approval from the Monash University Human Research Ethics Committee, participants were contacted via email or through advertisements placed in community areas. Participants were expected to spend approximately 2 minutes filling out the diary on a day during which they did not cry and 10 minutes on a day during which

they did. Responses were anonymous. Upon completion of the diary, participants were compensated with \$40.00.

5.8. Results

Three t-tests were conducted to determine whether the percentage of cries leading to change in mood differed between sexes. Table 5.1 presents the number of crying episodes resulting in changes in mood for each sex.

Table 5.1.

Percentage of cries leading to mood improvement, mood deterioration and no effect on mood and significance results between sex.

Effect of cry on	Females	Males	<i>t</i> -Test of difference
Mood	<i>n</i> (%)	<i>n</i> (%)	<i>p</i> values
Mood worsened	40 (23%)	3 (9%)	<i>p</i> =.024
Mood same	90 (52%)	19 (58%)	<i>p</i> =.54
Mood improved	44 (25%)	11 (33%)	<i>p</i> =.37

Male participants reported feeling worse after crying significantly less frequently than females, with the difference split roughly equally between no mood change and mood improvement.

To gain an understanding of the enduring impact of participant crying for each sex, a regression analysis was performed relating whether participants had cried with their average mood in the three following days. Basic descriptive statistics for the three day averages of all emotions can be found in Table 5.2.

Table 5.2

Basic descriptive statistics for emotions recorded using the daily diary by female and male participants averaged over 3 days.

	Females	Male
	Mean (SD)	Mean (SD)
Relaxed	4.97 (1.22)	5.38 (1.04)
Calm	4.92 (1.27)	5.02 (1.26)
Sad	2.29 (1.24)	2.27 (1.32)
Joyful	4.63 (1.46)	5 (1.27)
Tense	2.43 (1.35)	2.4 (1.34)
Fearful	2.03 (1.27)	2.15 (1.36)
Restless	2.53 (1.44)	2.65 (1.49)
Irritated	2.33 (1.33)	2.69 (1.53)
Bad Tempered	2.03 (2)	2.18 (1.32)
Nervous	2.38 (1.45)	2.18 (1.41)
Crying Proneness	1.93 (2.07)	1.4 (0.72)

Prior to regression analyses, a correlation matrix was calculated to determine which variables may be subject to exclusion based on colinearity and this can be found in Appendix T, Table T.1. Multicollinearity indicated that relaxed, calm, fearful and irritated had to be removed. Following this, the variance inflation factors for the remaining variables were below three. For females, there was a significant relationship between crying and mood on the following 3 days [$F(6,1113)=5.29, p<.05$] but this was not the case for males [$F(6,505)=.97, p>.05$]. However, when whether participants “tried to stop from crying” was used as the outcome variable, significant associations were found for

both females [$F(6,1113)=14.50, p<.05$] and males [$F(6,505)=4.55, p>.05$]. The significance and magnitude of predictor variables are presented in Table 5.3.

Table 5.3.

Standardised coefficient magnitude and significance of mood averaged over the next three days as predicted by participant crying and trying to stop from crying, presented by sex.

Emotions	Female		Male	
	Cried	Tried to Stop	Cried	Tried to Stop
Sad	.08*	.21*	.12	.09
Joyful	-.05	.01	.01	-.01
Restless	.01	-.03	-.14	-.22*
Bad Tempered	.00	-.03	.03	.30*
Nervous	.03	.11*	-.04	-.11
Crying Proneness	.06*	.01	.00	.04

*Note: significant predictors ($p<.05$) marked with an *.*

As can be seen in the Table 5.3, female participants were more likely to be sad and more prone to crying for three days following a crying episode but this association was even stronger if they had tried to stop themselves from crying (i.e. suppression). They were also more likely to feel nervous after trying to stop themselves from crying. For males, trying to stop themselves from crying was related to an average decrease in feeling restless for the following three days but a significant increase in feeling bad tempered.

Two logistic regressions were performed to determine if the presence or absence of other people were associated with mood change after crying in each sex. The first

regression analysed whether participant-rated mood change after crying was different if participants were alone or in the company of others by comparing the frequency of mood improvement (as opposed to either mood remaining the same or worsening) when participants were alone and in company. For females 41% of crying episodes occurred alone and males were alone for 34% of crying episodes.

There was no significant difference detected for males [$X^2(1,n=33)=.06, p>.05$] or females [$X^2(1,n=174)=.00, p>.05$]. The second logistic regression was designed to determine whether having exactly one person present increased the chance of mood improvement after crying where females cried with one other person present in 31% of cases and males in 21% of cases. This was managed by comparing the frequency of participant reported mood improvement in the presence of one other person with that of any other context but was also non-significant for both females [$X^2(1,n=174)=.05, p>.05$] and males [$X^2(1,n=33)=1.62, p>.05$].

5.9. Discussion

The aims of the present study were to investigate the utility of conceptualising adolescent crying as a form of emotion regulation and whether this is influenced by social support. The results supported the hypothesis that crying serves an emotion regulation function. A proportion of crying episodes produced a cathartic response for both male (25%) and female (33%) participants in the short term, indicating that crying may occur in situations of emotional distress as a method of immediate emotion regulation. This appears to contradict findings by Gračanin et al. (2015) which suggested that mood improvement after crying may be delayed. However, when the emotional impact of crying was assessed over a longer period using multivariate analyses, it was found that females were more likely to feel sad and more prone to crying after an incidence of crying and no significant prediction could be made about the mood of males.

In the present study, trying to avoid crying was predictive of greater sadness and nervousness for females and an increase in restlessness and bad tempered feelings for males. This can be understood through the emotion regulation concept of suppression, which has been linked to lower positive emotional experience and poor outcomes for mood repair (Gullone et al., 2010). In this way, crying could be seen as a behaviour that does not actively improve mood but rather helps an individual return to a state of emotional balance. This is consistent with the Labott and Martin (1988) conceptualization of crying, proposing it is part of a recovery phase following emotional turmoil.

Unlike emotion regulation conceptualisations, social conceptualisations of crying received no support from the current data. Despite participants reporting being with others during some crying episodes and experiencing catharsis on some of these occasions, the presence of one other or multiple others did not predict mood improvement following crying. This indicates that the social and contextual factors found by Bylsma et al. (2008) in adults may be different in adolescence and that adolescents do not experience greater catharsis with others than when alone. This may be related to the fact that adolescents are more sensitive to social judgement than other developmental groups (Sumter, Bokhorst, Miers, Van Pelt, & Westenberg, 2010). It is possible that these results indicate a greater propensity for adolescents to cry in situations where support is not offered by those around them, rather than that social support has no influence on mood after crying. However, it is not possible to fully understand this difference because no information was gathered about the nature of the social interactions between the crier and those near them. Together, these results suggest that, at least in adolescents, crying is predominantly an implicit, response focussed form of emotion regulation through cathartic venting. This study found no evidence that crying performs an antecedent

focussed benefit in adolescents in that the presence of others was not associated with improved mood after crying.

This study highlights significant differences between the sexes in their crying behaviour and also distinguishing characteristics of adolescence, underlining it as a distinct developmental period in regards to crying. Previous research with adult females using a similar methodology found that mood worsened following crying far less frequently than in the present sample (Bylsma et al., 2011). In the current study, it is notable that male participants reported a mood drop following crying far less frequently than did females. It is possible that male participants are less likely to cry in situations that will result in a mood drop, such as crying in unsupportive social situations, due to fear of negative social judgement. Accounting for the increase in proportion of cries resulting in mood deterioration for females in adolescence when compared with adulthood is more difficult; it is possible that younger females are more likely to cry in situations that are perceived to lead to embarrassment than adults, but further research is needed to clarify this explanation.

The results of this paper contribute substantially to the growing body of research surrounding the crying behaviour of adolescents but are also attenuated by limitations. As no measure of social support surrounding crying was included in the diary, the non-significant result relating to social context and cathartic release is ambiguous. Further, although retrospective bias is minimised by the daily diary format, some recall bias is inherent in the results because the data are not recorded instantaneously.

As the use of a diary for investigating crying behaviour has only recently been developed (Bylsma et al., 2011), it is important to note that the information and analyses presented in this paper would not have been possible using traditional measures that require longer-term recall of crying behaviour. Future research can extend these results by

providing a more in-depth consideration of social support and catharsis in adolescence. There are still very few publications on crying in developmental periods other than adulthood and infancy, and the results of the present paper point to the usefulness of exploring emotion regulation as a function of crying in other developmental contexts.

5.10. References

- Becht, M. C., & Vingerhoets, A. J. J. M. (2002). Crying and mood change: A cross-cultural study. *Cognition & Emotion*, *16*(1), 87–101.
- Bylsma, L. M., Croon, M. a., Vingerhoets, A. J. J. M., & Rottenberg, J. (2011). When and for whom does crying improve mood? A daily diary study of 1004 crying episodes. *Journal of Research in Personality*, *45*(4), 385–392.
- Bylsma, L. M., Vingerhoets, A. J. J. M., & Rottenberg, J. (2008). When is crying cathartic? An international study. *Journal of Social and Clinical Psychology*, *27*(10), 1165–1187.
- Cornelius, R. R., & Labott, S. M. (2001). The social psychological aspects of crying. In A. J. J. M. Vingerhoets & R. R. Cornelius (Eds.), *Adult crying: A biopsychosocial approach* (pp. 159-176). Hove, East Sussex: Brunner-Routledge.
- Gračanin, A., Bylsma, L. M., & Vingerhoets, A. J. J. M. (2014). Is crying a self-soothing behavior? *Frontiers in Psychology*, *5*, 502.
- Gračanin, A., Vingerhoets, A. J., Kardum, I., Zupčić, M., Šantek, M., & Šimić, M. (2015). Why crying does and sometimes does not seem to alleviate mood: A quasi-experimental study. *Motivation and emotion*, *39*(6), 953-960.
- Gross, J. J. (1998). The emerging field of emotion regulation: An integrative review. *Review of General Psychology*, *2*(3), 271–299.
- Gullone, E., Hughes, E. K., King, N. J., & Tonge, B. (2010). The normative development of emotion regulation strategy use in children and adolescents: A 2-year follow-up study. *Journal of Child Psychology and Psychiatry, and Allied Disciplines*, *51*(5), 567–74.

Gullone, E., & Taffe, J. (2012). The Emotion Regulation Questionnaire for Children and Adolescents (ERQ-CA): A psychometric evaluation. *Psychological Assessment, 24*(2), 409–17.

Hendriks, M. C. P., Croon, M. A., & Vingerhoets, A. J. J. M. (2008). Social reactions to adult crying: The help-soliciting function of tears. *The Journal of Social Psychology, 148*(1), 22–41.

Hendriks, M. C. P., Nelson, J. K., Cornelius, R. R., & Vingerhoets, A. J. J. M. (2008). Why crying improves our well-being: An attachment-theory perspective on the functions of adult crying. In A. J. J. M. Vingerhoets, I. Nyklíček, & J. Denollet (Eds.), *Emotion regulation* (pp. 87–96). New York: Springer.

Jellesma, F. C., & Vingerhoets, A. J. (2012). Crying in middle childhood: A report on gender differences. *Sex roles, 67*(7-8), 412-421.

Labott, S. M., & Martin, R. B. (1988). Weeping: evidence for a cognitive theory. *Monographs of the Society for Research in Child Development, 12*(3), 205–216.

Lombardo, W. K., Cretser, G. A., & Roesch, S. C. (2002). For crying out loud- the differences persist into the '90s. *Sex Roles, 45*(7/8), 529–547.

Maas, J., Laan, A., & Vingerhoets, A. J. J. M. (2011). Attachment, emotion regulation and adult crying. In I. Nyklíček, A. Vingerhoets, & M. Zeelenberg (Eds.), *Emotion regulation and well-being* (pp. 181–195). New York: Springer New York.

Neu, J. (1987). A tear is an intellectual thing. *Representations, 19*(19), 35–61.

Peter, M., Vingerhoets, A. J., & Van Heck, G. L. (2001). Personality, gender, and crying. *European Journal of Personality, 15*(1), 19-28.

Steinberg, L. (2005). Cognitive and affective development in adolescence. *Trends in Cognitive Sciences, 9*(2), 69–74.

Sumter, S. R., Bokhorst, C. L., Miers, A. C., Van Pelt, J., & Westenberg, P. M. (2010). Age and puberty differences in stress responses during a public speaking task: Do adolescents grow more sensitive to social evaluation? *Psychoneuroendocrinology*, *35*(10), 1510–6.

Thompson, R. A. (1994). Emotion regulation: A theme in search of definition. *Monographs of the Society for Research in Child Development*, *59*(2), 25–52.

Van Tilburg, M. A. L., Unterberg, M. L., & Vingerhoets, A. J. J. M. (2002). Crying during adolescence: The role of gender, menarche, and empathy. *British Journal of Developmental Psychology*, *20*(1), 77–87.

Vingerhoets, A. J. J. M., Cornelius, R. R., Van Heck, G. L., & Becht, M. C. (2000). Adult crying: A model and review of the literature. *Review of General Psychology*, *4*(4), 354–377.

Chapter 6: A Typology of Adolescent Crying

6.1 Preamble to empirical paper

Presented in this chapter is a preliminary typology of crying developed using factor analysis techniques and based on data gathered using the adapted crying diary in a sample of adolescents. This generates a theoretical framework in which to consider future theorising on crying. In particular, several of the typologies presented here are consistent with previously suggested conceptualizations of crying and may allow for a more holistic consideration of different conceptualizations of crying.

The article was submitted to *Journal of Adolescence* on the 19th of January 2015. The *Journal of Adolescence* is an international journal which publishes empirical and clinical studies relating to the development of adolescents between puberty and the attainment of adult status within society. The journal has an impact factor of 1.638. This paper has been formatted in accordance with the style specified by the editorial board of this journal.

Monash University

6.2 Declaration of thesis chapter 6

In the case of chapter 6, the nature and extent of my contribution to the work was the following:

Nature of contribution	Extent of contribution
Literature review, project design, data collection, data analysis and writing of paper.	70%

The following co-authors contributed to the work. If co-authors are students at Monash University, the extent of their contribution in percentage terms must be stated:

Name	Nature of contribution	Extent of contribution (%) for student co-authors only
Dr Glenn Melvin	Contributed to study design, data collection input, review of manuscript drafts and general supervisory input.	
Dr Eleonora Gullone	Contributed to study design, data collection input, review of manuscript drafts and general supervisory input.	
Dr Tom Whelan	Contributed to study design, data collection input, review of manuscript drafts and general supervisory input.	

The undersigned hereby certify that the above declaration correctly reflects the nature and extent of the candidate's and co-authors' contributions to this work.

Candidates Signature

Date

Main Supervisor's Signature

Date

6.3 Title Page

Title

A Study of Crying Behaviour in Adolescence using a Daily Diary

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6.4. Abstract

A number of conceptualizations have been proposed to explain crying behaviour but none have been thoroughly evaluated. Each conceptualization of crying appears to link with crying behaviour in a particular context, suggesting that there could be different ‘types’ of crying behaviour. This study aimed to investigate how well ‘types’ of crying relate to several key proposed conceptualizations. Data analysed constituted 216 crying episodes collected from 42 adolescents using a daily diary. Using a factor analysis, four types of crying were identified: depressive, confrontational, joyful, and empathic. These types variously provide support for several proposed crying conceptualizations, particularly empathic and helplessness conceptualizations. The implications of these findings are discussed with regards to the utility of proposed crying conceptualizations and the framing of future investigation.

6.5. Introduction

There are several as yet untested conceptualizations of the purpose of crying. These include considering crying a cathartic release of negative emotions (Rottenberg, Bylsma, & Vingerhoets, 2008), a core attachment behaviour (Bell & Ainsworth, 1972; Nelson, 1998), an expression of empathy (Hill & Martin, 1997), a means of manipulation (Neu, 1987; Zeman & Shipman, 1996) or a bi-product of cognitive processes (Labott & Martin, 1988; Miceli & Castelfranchi, 2003).

Emotion regulation is a construct that encompasses how well individuals are able to influence their emotional state as well as the strategies by which they enact this influence (Gross & John, 2003; Gross, 1998b). Crying may serve an emotion regulation function via a cathartic release of negative emotion (Becht & Vingerhoets, 2002; Bylsma et al., 2011, 2008). Conversely, attachment theory proposes that people cry in order to receive help and sympathy from people in their environment. This is supported by findings which show that mood is more likely to improve after crying if one other person is present (Bylsma et al., 2011), which links closely with the proposed relationship between crying and empathy. An alternative view of crying is as a by-product of cognitive processes. Miceli and Castelfranchi (2003) propose that the central cognitive mechanism in crying is the perception that an individual cannot successfully resist or cope with an overwhelmingly difficult situation. The authors posit that it is when an individual feels they are unable to cope with an overwhelming stimulus that they internally 'give up' and outwardly cry.

Hill and Martin (1997) suggest that crying has two purposes: elicitation and communication of empathy. One person may be crying to gain attention, sympathy and support while their companion may cry to signal support, sympathy or sincerity. This conceptualization of crying as honest communication contrasts with the manipulative conceptualization of crying which suggests that people cry to improve their circumstances

(Soltis, 2004). Adults often expect to be seen as manipulative when they are crying, yet there is no evidence that others perceive people as manipulative when they are crying (Hendriks, Croon, et al., 2008).

Vingerhoets, Cornelius, Van Heck, and Becht (2000) proposed a meta-model in an attempt to synthesise the important, though often contradictory, conceptualizations of crying to enable empirical investigation. According to this meta-model, an objective situation or stimulus is cognitively appraised by an individual in terms of personal meaning, which leads to an internal representation and understanding of the stimulus (Vingerhoets et al., 2000). The individual then has an emotional reaction to this internal representation and may express this emotion through crying. Each step in this process is moderated by various personal factors such as gender, hormonal levels, and the presence of others. If an individual does cry, there is a posited direct effect on emotional experience and the individual's appraisal of their circumstance. In addition, several environmental outcomes of crying are proposed, including the offering of emotional, cognitive or instrumental support for the crier. These different considerations indicate that crying may serve different functions depending on the circumstance in which it occurs.

To date, the vast majority of research has focussed on the periods of infancy and adulthood (Rottenberg & Vingerhoets, 2012) with little consideration for how crying develops between these life stages. In addition, little research has utilised a mixed sex sample, with much of the current theorising based on female only samples (Lombardo et al., 2002). Adolescence is a period of rapid cognitive and social development and the transition point between relative dependence on caregivers and social independence (Rice, 1990), as well as the time when a sex difference in crying behaviour is established (Van Tilburg et al., 2002). Therefore, it provides a unique opportunity to consider the ways in which crying can be understood.

In order to broaden the empirical basis of theoretical models of crying, the present study utilises a mixed sex sample of adolescents who reported on their crying behaviour over a 6 week period. Given the diversity of conceptualizations of crying and their contribution to a unified conceptual model (Vingerhoets et al., 2000), it is proposed that crying may perform different functions and represent a number of these conceptualizations depending on social context, stimulus, and personal variables. Therefore, the primary aim of this paper was to separate crying behaviour into types of crying which reflect the different reasons that participants cried. It was hypothesised that resulting crying types will differ based on participant sex and who is present, and will result in different profiles of crying intensity, mood change and situational change. These ‘types of crying’ are hypothesised to relate to existing conceptualizations of crying.

6.6. Method

Participants

Participants aged between 12 and 18 years were recruited via four means: by engaging returning participants of the Emotions Project (Gullone et al., 2010; Gullone & Taffe, 2012), by involving sporting organisations and other community groups, through an advertisement on community websites, and via word of mouth. Of the participants, 29 females (mean age of 16.14, $SD=1.58$) and 13 males (mean age of 14.91, $SD=1.80$) returned their diaries. An additional 14 respondents dropped-out providing a 75% return rate.

Materials

The study included a revised version of the Adult Crying Diary utilised by Bylsma, Croon, Vingerhoets and Rottenberg (2011). The revisions were aimed at modifying the diary to better suit adolescent participants and provide extra information on the reasons for crying. The Adolescent Crying Diary comprised 26 questions arranged in

four main sections: (1) emotional experience, (2) crying details, (3) details of attempts to avoid crying, and (4) factors contributing to the most intense cry. Participants filled in the diary for six weeks, allowing menstruating female participants to experience at least one full menstrual cycle over the course of the study. This study utilises data collected from sections 2 and 4 of the Diary.

Section 2 of the Adolescent Crying Diary comprised nine basic details regarding crying episodes: whether participants felt like crying that day whether, and how many times they had cried, who was present, where they were during the crying episode, what time it was, how long the episode lasted, how intense it was, and whether participants believed that their mood or the situation improved afterwards.

Section 4 of the Adolescent Crying Diary asked participants to specify the degree to which 24 factors contributed to their crying episode. Participants were asked to rate how much each factor contributed to a crying episode on a 7-point scale where “1” represented the factor contributing “not at all” and “7” represented it contributing “very strongly” to the described crying episode. The statements presented to participants are shown in Table 6.1. Additionally, participants were provided the space to include up to seven further factors if they believed the available options were insufficient.

Procedure

Participants were contacted following ethics approval from the Monash University Human Research Ethics Committee. All parents and adolescents were provided with explanatory statements and an opportunity to discuss the study with a researcher. Those who returned consent forms were then sent the diary by mail along with a return paid envelope. Data were collected between June 2013 and March 2014. The diary was expected to require approximately 2 minutes to complete on the days participants did not cry and 10 minutes on days when they did cry. Participants recorded entries in their diary

for 42 days. Upon completion of the diary, participants were reimbursed \$40 for their time.

Table 6.1.

Possible contributing factors to a crying episode.

Personal & Contextual Factors	Emotions	Self-Conscious Emotions
Conflict	Sadness	Pride
Loss	Happiness	Powerlessness
Personal failure	Relief	Sorry for myself
Personal rejection	Fear	Loneliness
Witnessing suffering of others	Anger	Inspiration
Positive experiences	Pity	Stress
Physical condition or physical pain	Guilt	
Negative thoughts about myself		
Negative thoughts about others		
Feeling unable to control your feeling(s)		

6.7. Results

Across all returned diaries, just 4% of data about crying episodes were missing. Male participants reported crying between 0 and 11 times during the 42 day response period with a mean of 3.08 while female participants reported crying between 0 and 51 times with the mean being 10.72. Of the sample, 10% ($n=3$) of female and 39% ($n=5$) of male participants reported not crying during their response period. Altogether this provided a sample of 215 crying episodes drawn from 36 of the study's participants.

To determine if reported reasons for crying were able to be understood in consistent themes, factor analysis was conducted using reasons for crying as variables: anger, conflict, fear, guilt, happiness, helplessness, hopelessness, inspiration, loneliness, negative thoughts about others, negative thoughts about self, personal failure, pity, positive experiences, powerlessness, pride, rejection, relief, sadness, self-pity, stress, witnessing suffering. Basic descriptive statistics for each of these variables can be found in Appendix U, Table U.1.

Initial factor analysis produced six factors with eigenvalues greater than one. However, inspection of the scree plot, comparison of oblique and orthogonal rotation, and confirmatory factor analysis showed that four factors provide a more stable solution. The four rotated factors can be viewed as ‘types’ of crying and were named Depressive, Confrontational, Joyful, and Empathic to reflect their loadings. These four factors are presented in Table 6.2 with loadings above .4 ordered by size. Only one variable shared loading across factors (*Negative Thoughts about Others*) while two variables (*Loss* and *Physical Pain*) did not load on any factor and have been excluded from the table.

The Depressive crying factor represents crying that occurs in response to experiencing negative thoughts about self and others and was characterised by aversive emotions and pessimistic evaluations. The Confrontational crying factor was also reflective of negative thoughts about others but had unique loadings related to interpersonal conflict. In contrast, the Joyful crying factor represents crying when experiencing positive emotions and circumstances. Finally, the Empathic crying factor reflected crying while experiencing sadness or pity in relation to the negative experiences of others. Notably, many of the recorded episodes of Empathic crying referred specifically to a sad TV show, movie or book as the precursor to crying.

Table 6.2.

Rotated factor structure of reasons participants reported for crying behaviour with 4 stable factors representing different 'types' of crying behaviour in adolescence. Loadings presented below are only those of .4 or greater magnitude.

Reason for Crying	Types of Crying			
	Depressive	Confrontational	Joyful	Empathic
Loneliness	.88			
Negative Thoughts about Self	.86			
Hopelessness	.84			
Rejection	.81			
Personal Failure	.73			
Powerlessness	.73			
Self-pity	.67			
Helplessness	.60			
Stress	.47			
Fear	.46			
Negative Thoughts about Others	.43	.41		
Conflict		.75		
Anger		.66		
Guilt		.49		
Happiness			.92	
Positive Experiences			.89	
Relief			.61	
Pride			.54	
Inspiration			.52	
Witnessing Suffering				.69
Sadness				.58
Pity				.51

Confirmatory factor analysis was conducted using the four factor structure. Indices of model fit were calculated to provide an indication of how well the factor solution explained the current data, taking sample size into account. Root Mean Square Error of Approximation (RMSEA) for the model was .095 while Comparative Fit Index (CFI) was .83. In addition, to examine the impact of the non-independence of 215 data points where individuals contributed different numbers of crying episodes, 10 further factor analyses were performed on bootstrapped samples generated by randomly resampling from the data with replacement up to dummy samples of 215. This investigated how stable each factor would be if the impact from individuals within the sample was randomly inflated or deflated. These solutions were then compared with that developed using the complete dataset to determine if there was undue influence of certain episodes of crying on the overall formulation.

In each solution, factors approximating the original four were present, however, the variables that loaded onto them changed slightly. The Depressive crying type always included loneliness, negative thoughts about self, hopelessness, rejection, personal failure, powerlessness, self-pity, and helplessness. Sometimes it did not include stress, fear and negative thoughts about others and in some solutions it included guilt or sadness. The Confrontational crying type always included conflict and anger and sometimes did not include guilt or negative thoughts about others. Rarely, it included personal failure, stress, fear, or relief. The Joyful crying type remained the most stable, always including happiness, positive experiences, and pride and rarely not including relief and inspiration. None of the solutions included any additional variables in this factor. Finally, the Empathic crying type always included all three of the variables in the original solution (witnessing suffering, sadness, and pity) and it occasionally included loss, inspiration, or a negative loading from physical pain. The presence or absence of each variable as a

loading at or above .4 across the alternative solutions is presented in full, in Table U.2 in Appendix U.

Confirmatory factor analyses were then run on each of these 10 bootstrapped solutions using the original sample. Of these, three solutions were unable to be calculated on the original sample and seven could be calculated successfully. Of the seven successful confirmatory factor analyses, model fit analyses produced a mean RMSEA of .096 ($SD=.0016$, ranging from .094 to .099) and mean CFI of .83 ($SD=.057$, ranging from .82 to .84). Guidelines for interpretation of RMSEA suggest that score lower than .07 show acceptable model fit (Steiger, 2007) while scores between .08 and .10 has been suggested as showing a mediocre fit (Hooper, Coughlan, & Mullen, 2008). CFI values range from zero to one with higher values representing more accurate model fit, current guidelines suggest values above .95 produce the best tradeoff between type II and type I error rates (Hu & Bentler, 1999). However, Hu and Bentler (1999) note that this is oversensitive when used with models based on sample sizes below 250.

For the present model, neither the RMSEA nor the CFI are consistent with best practice guidelines. However, as both the RMSEA and CFI approach their respective target values and taking into account the sample size of 215 increases the type II error rate, the current analysis represents a strong basis from which to consider further research. Despite this, the factor solution generated using this data must be interpreted with caution due to the non-independence of individual crying episodes; multiple episodes were recorded for some individuals. While none of the bootstrap generated solutions produced a superior combination of low RMSEA and high CFI than the original solution, their similarity suggests that the placement of the items that varied in their loadings may be less certain if developed using a sample of independent crying episodes.

To establish if these types of crying were differentially related to contextual or personal factors, five multiple linear regression analyses were performed. These used aggregate values of the crying factors found to contribute to the different types of crying as outlined above. The standardized coefficients resulting from these regressions are presented in Table 6.3.

Table 6.3.

Standardized coefficients of types of crying from four multiple linear regressions with outcome variables: Emotional Change, Instrumental Change, Intensity, With Others, and Maleness.

Type of Crying	Emotional	Instrumental	Intensity	With Others	Maleness
Depressive	-.39**	-.32**	.52**	-.30**	-.18*
Joyful	.14**	.09	-.07	-.05	.01
Confrontational	.12	.12	-.07	.25**	.05
Empathic	.02	.05	-.08	-.11	-.14*

*Note: Significant ($p < .05$) coefficients are marked with an ** while coefficients approaching significance are marked with a single *.*

Multiple regression with emotional change following crying entered as the dependent variable and the four factors, or crying types, entered as predictor variables was significant [$F(4,206)=7.61, p < .05$]. Specifically, Depressive type crying was associated with mood deterioration while Joyful crying was associated with mood improvement. Crying type was also significantly predictive [$F(4,206)=3.85, p < .05$] when entered into a regression where instrumental change, or change in the experienced situation in which crying took place, was the outcome variable. Specifically, Depressive crying was associated with the perception that the situation worsened after crying.

A significant model was generated when crying intensity was entered as an outcome variable [$F(4,205)=13.41, p<.05$], indicating that Depressive type crying was associated with higher intensity more consistently than others. Multiple regression showed that crying types were predictive [$F(4,207)=4.95, p<.05$] of whether crying occurred in the presence of others or when the adolescent was alone. Here, Depressive crying was less likely in the presence of others while Confrontational crying was more likely. Finally, with participant sex as the outcome, a multiple regression using the crying types as predictors was significant [$F(4,206)=2.97, p<.05$]. However, as shown in Table 6.3, no predictor reached significance despite the overall significant model. Two crying types approached significance, suggesting Depressive type crying ($p=.053$) and Empathic type crying ($p=.056$) may both be more associated with female than male adolescents.

6.8. Discussion

The participants sampled in this study exhibited four distinct types of crying: Depressive, Confrontational, Joyful, and Empathetic. These types of crying are consistent with meta-model described by Vingerhoets et al. (2000) and map closely onto three of the four factors that Denckla, Fiori, and Vingerhoets (2014) found to be related to crying proneness. Specifically, the Societal factor (e.g., crying as a result of “conflict in a group”) is similar to this study’s Conflict, the Sentimental factor (e.g., crying “when someone is very happy”) is similar to this study’s Joyful, and the Compassionate factor (e.g., crying ‘When someone feels miserable’, “When you see how bad the world is, and that people do terrible things to each other”) has elements similar to both the Depressive and Empathetic crying types of the current study. The four crying types offer insights into adolescent crying behaviour and relate to previously proposed conceptualizations of the function of crying including emotion regulation, attachment, empathy, manipulation and helplessness.

The results of this study show that a proportion of crying episodes resulted in mood improvement, and are therefore indicative of successful, implicit (Gyurak et al., 2011) emotion regulation. Joyful type crying was most likely to result in mood improvement while Depressive type crying was associated with mood deterioration. This suggests that, in certain cases, crying increases the magnitude of the feelings rather than altering emotional valence, making bad feelings worse and good feelings better. However, this is incongruent with the view of crying as a means of emotion regulation (Gračanin, Bylmsa, & Vingerhoets, 2014; Maas et al., 2011) and may be more consistent with the helplessness conceptualization of crying proposed by Miceli and Castelfranchi (2003). Furthermore, depressive crying was likely to be more intense than the other types of crying and to occur when someone was alone. It was characterised by powerlessness and feeling unable to control emotions which is consistent with the view that when people are overwhelmed by their feelings, they 'give up', resulting in crying (Miceli & Castelfranchi, 2003).

Confrontational type crying primarily occurred in the presence of others but was not predictive of mood change. Interestingly, previous findings show that crying related to interpersonal conflict results in worsened mood (Bylmsa et al., 2011). However, this research utilised a sample of adult women and the difference between these results may be explained by developmental differences in the participants or by the inclusion of males. More research into the differences between adolescent and adult crying is required to fully understand such a finding.

Of the more interpersonal explanations of crying proposed, the empathic conceptualization (Hill & Martin, 1997; Van Tilburg et al., 2002) was best supported by the current results. Empathic crying, as characterised by witnessing the suffering of others along with feelings of sadness and pity, was identified as one of the four types of crying,

indicating that expressing empathy was one of the key reasons for crying. Instrumental or manipulative crying (Soltis, 2004) and an attachment based conceptualization of crying (Maas et al., 2011; Nelson, 2005) were not as well represented. There was no indication that any crying type was associated with perceived improvement in the external situation as may be suggested by an instrumental or behavioural view of crying. Crying in the presence of others was most associated with crying caused by interaction with others and inversely related to Depressive type crying. A more nuanced consideration of the social and contextual factors related to crying episodes may provide greater clarity about how these or other crying types relate to proposed interpersonal conceptualizations of crying in adolescence.

These findings need to be regarded in the context of certain limitations. Although efforts were made to check the factor solution for the impact of the non-independence of the data points, the impact this may have had on the factor solution is unclear and the results must be considered with caution. A larger sample size would allow for each crying episode to be from a different person, minimising the impact of individual difference on a factor analysis. The current factor solution produced only modest confirmatory factor model fit indices which, while encouraging, indicate that the number of factors and the loading of variables on those factors may not remain stable if applied to another sample. As such, this study should be seen to provide a framework for future research to consider, rather than as a definitive description of crying types. Greater sample sizes and consideration of crying across multiple developmental stages will help to describe clearer crying types.

The four types of crying identified in this research are an example of a more nuanced, structured approach to crying research than has been undertaken previously. Crying is typically considered as a single entity in both its measurement and statistical

treatment with, for example, all recorded crying behaviour being used to determine if there is mood improvement after crying (Becht & Vingerhoets, 2002; Bylsma et al., 2011), whether crying differs between genders (Jellesma & Vingerhoets, 2012; Lombardo et al., 2002), or what the purposes of crying are (Hill & Martin, 1997; Maas et al., 2011; Miceli & Castelfranchi, 2003). The nuanced approach used in this study to examine types of crying can be applied in many developmental groups and the types of crying outlined in this study may be directly relevant to other developmental groups. Moreover, any differences found using a similar methodology may elucidate changes in crying behaviour across the lifespan.

The other major contribution of this study is in demonstrating the level of support for different conceptualizations of crying. Of the crying types presented, empathetic crying strongly supports an empathic conceptualization of crying (Hill & Martin, 1997; Van Tilburg et al., 2002) while not putting it in opposition to other proposed explanations. The helplessness conceptualization of crying was also strongly supported by the data with the constituents and correlates of depressive crying fitting within its framework. However, the emotion regulation, attachment and manipulative conceptualizations of crying received little support and further research is required to fully understand how they may function in the context of 'types' of crying.

Current understanding of crying behaviour is built on a number of separate conceptualizations that have been developed into a meta-model (Vingerhoets et al., 2000). This model suggests that differences in the context of crying (such as situation or physical state) influence crying behaviour which supports the idea of 'types' of crying. In this study, four different types of crying behaviour have been outlined, providing support for several of the key conceptualizations of crying, particularly the empathic conceptualization of crying and that of helpless crying. Importantly, no one

conceptualization of the cause of crying appears able to explain all types of crying described here. Typologies of crying, such as that developed in this study, could greatly contribute to our understanding how and when particular conceptualizations best explain crying.

6.9. References

- Becht, M. C., & Vingerhoets, A. J. J. M. (2002). Crying and mood change: A cross-cultural study. *Cognition & Emotion*, *16*(1), 87–101.
- Bylsma, L. M., Croon, M. a., Vingerhoets, A. J. J. M., & Rottenberg, J. (2011). When and for whom does crying improve mood? A daily diary study of 1004 crying episodes. *Journal of Research in Personality*, *45*(4), 385–392.
- Bylsma, L. M., Vingerhoets, A. J. J. M., & Rottenberg, J. (2008). When is crying cathartic? An international study. *Journal of Social and Clinical Psychology*, *27*(10), 1165–1187.
- Cornelius, R. R., & Labott, S. M. (2001). The social psychological aspects of crying. In A. J. J. M. Vingerhoets & R. R. Cornelius (Eds.), *Adult crying: A biopsychosocial approach*. Hove, East Sussex: Brunner-Routledge.
- Gračanin, A., Bylsma, L. M., & Vingerhoets, A. J. J. M. (2014). Is crying a self-soothing behavior? *Frontiers in Psychology*, *5*, 1-15.
- Gračanin, A., Vingerhoets, A. J., Kardum, I., Zupčić, M., Šantek, M., & Šimić, M. (2015). Why crying does and sometimes does not seem to alleviate mood: A quasi-experimental study. *Motivation and emotion*, *39*(6), 953-960.
- Gross, J. J. (1998). The emerging field of emotion regulation: An integrative review. *Review of General Psychology*, *2*(3), 271–299.
- Gullone, E., Hughes, E. K., King, N. J., & Tonge, B. (2010). The normative development of emotion regulation strategy use in children and adolescents: A 2-year follow-up study. *Journal of Child Psychology and Psychiatry, and Allied Disciplines*, *51*(5), 567–74.
- Gullone, E., & Taffe, J. (2012). The Emotion Regulation Questionnaire for Children and Adolescents (ERQ-CA): A psychometric evaluation. *Psychological Assessment*, *24*(2), 409–17.

Hendriks, M. C. P., Croon, M. a, & Vingerhoets, A. J. J. M. (2008). Social reactions to adult crying: The help-soliciting function of tears. *The Journal of Social Psychology, 148*(1), 22–41.

Hendriks, M. C. P., Nelson, J. K., Cornelius, R. R., & Vingerhoets, A. J. J. M. (2008). Why crying improves our well-being: An attachment-theory perspective on the functions of adult crying. In A. J. J. M. Vingerhoets, I. Nyklíček, & J. Denollet (Eds.), *Emotion regulation* (pp. 87–96). New York: Springer.

Jellesma, F. C., & Vingerhoets, A. J. (2012). Crying in middle childhood: A report on gender differences. *Sex roles, 67*(7-8), 412-421.

Labott, S. M., & Martin, R. B. (1988). Weeping: Evidence for a cognitive theory. *Monographs of the Society for Research in Child Development, 12*(3), 205–216.

Lombardo, W. K., Cretser, G. A., & Roesch, S. C. (2002). For crying out loud- the differences persist into the '90s. *Sex Roles, 45*(7/8), 529–547.

Maas, J., Laan, A., & Vingerhoets, A. J. J. M. (2011). Attachment, emotion regulation and adult crying. In I. Nyklíček, A. Vingerhoets, & M. Zeelenberg (Eds.), *Emotion regulation and well-being* (pp. 181–195). New York: Springer New York.

Neu, J. (1987). A tear is an intellectual thing. *Representations, 19*(19), 35–61.

Peter, M., Vingerhoets, A. J., & Van Heck, G. L. (2001). Personality, gender, and crying. *European Journal of Personality, 15*(1), 19-28.

Soltis, J. (2004). The signal functions of early infant crying. *The Behavioral and Brain Sciences, 27*(4), 443–490.

Steinberg, L. (2005). Cognitive and affective development in adolescence. *Trends in Cognitive Sciences, 9*(2), 69–74.

Sumter, S. R., Bokhorst, C. L., Miers, A. C., Van Pelt, J., & Westenberg, P. M. (2010). Age and puberty differences in stress responses during a public speaking task: Do

adolescents grow more sensitive to social evaluation? *Psychoneuroendocrinology*, 35(10), 1510–6.

Thompson, R. A. (1994). Emotion regulation: A theme in search of definition. *Monographs of the Society for Research in Child Development*, 59(2), 25–52.

Van Tilburg, M. A. L., Unterberg, M. L., & Vingerhoets, A. J. J. M. (2002). Crying during adolescence: The role of gender, menarche, and empathy. *British Journal of Developmental Psychology*, 20(1), 77–87.

Vingerhoets, A. J. J. M., Cornelius, R. R., Van Heck, G. L., & Becht, M. C. (2000). Adult crying: A model and review of the literature. *Review of General Psychology*, 4(4), 354–377.

Chapter 7. General Discussion

7.1. Introduction

This chapter will discuss the overall findings of the thesis. The findings from the four empirical studies will be synthesised and conclusions will be drawn whilst taking existing literature into account. Discussion will address the aims of the research as stated in the first chapter: (1) to begin to fill some of the knowledge gaps regarding adolescent crying, (2) to develop a method of collecting daily, episode focussed information about adolescent crying, and (3) to provide formative data on previously proposed conceptualizations of crying. The contributions and limitations of the research with regards to each of these aims will be discussed along with practical implications and the novelty of the research and suggestions for extension of this research.

7.2. Aim 1: To fill gaps in the knowledge surrounding adolescent crying

Despite the presence of crying throughout all stages of life, little attention has been given to this behaviour other than during infancy and adulthood. Thus, there is no clear understanding of how crying behaviour develops from infancy to adulthood. Chapter 2 discusses this in detail, outlining the lack of research that has been conducted with children, adolescents and the elderly and the consequences of this knowledge gap.

Another major gap in crying literature regards males, who are usually excluded from crying studies (e.g., Bylsma, Croon, Vingerhoets, & Rottenberg, 2011; Hill & Martin, 1997). There is an understanding that males cry less frequently than females, and that this is likely due to social pressures, but the mechanisms for this are largely unstudied (Lombardo et al., 2002). This thesis aimed to address these deficiencies by studying crying behaviour during late childhood and adolescence in a mixed sex sample.

Fundamental information about crying behaviour in adolescence is missing and one aim of this thesis was to fill some of these gaps including the personal characteristics

related to crying proneness (chapter 3), the differences in crying proneness and frequency between sexes (chapters 3, 4), the emotion regulation and attachment functions of crying (chapter 5), the contexts in which adolescents cry most frequently (chapter 4, 5) and the different reasons for adolescent crying (chapter 6).

As discussed in chapter 2, crying is by far most frequent in infancy, with crying occurring on average four times per hour in both sexes (Bell & Ainsworth, 1972; van Ijzendoorn & Hubbard, 2010). This is not surprising since at this early age and particularly in the pre-verbal period, crying is the primary auditory means of communication. Past studies have shown that between the ages of 9 and 11 years, girls cry on average once every 7.4 days and boys once every 9.6 days (Jellesma & Vingerhoets, 2012). Girls aged between 11 and 16 cry once every 7 days and boys of the same age cry once every 14 days (Van Tilburg, Unterberg & Vingerhoets, 2002). There are no data regarding how frequently non-clinical adult males cry, though males meeting clinical criteria for a major mental health disorder have been found to cry once every 5.7 days as compared with similar adult females who cry once every 4.3 days (Rottenberg, et al., 2008). Until the current thesis was undertaken, precisely when crying frequency begins to differ between the sexes was unknown. Chapter 3 revealed that, at the age of 11 years a significant difference emerges in crying behaviour where females begin to cry more frequently than males. However, these are not the only individual characteristics that vary with crying behaviour.

It is well known that crying behaviour differs between individuals for reasons outside of age and sex (Hasson, 2009; Martin & Labott, 1991) but very little evidence has been gathered to explain these differences. Chapter 3 addressed the lack of information regarding adolescent crying by examining how and why crying frequency differs between individual children and adolescents. Analyses revealed that the correlates of crying

frequency differ between sexes and by age. Both older (11+ years of age) males and older females were likely to be more prone to crying if they were more empathetic and less likely to be prone to crying if they used reappraisal as an emotion regulation strategy. Additionally, females cried more frequently if they were prone to feeling ashamed and less frequently if their parents exhibited high levels of care. Aside from personal characteristics, this thesis provides support for emotion regulation and empathy contributing to interpersonal differences, as well as the menstrual cycle leading to intrapersonal variance in crying.

Literature regarding emotion regulation has focussed primarily on the strategies of suppression and reappraisal, though there is recognition that other, unstudied methods of emotion regulation exist. A recent study by Ardana, Whelan and Melvin (unpublished manuscript) showed that using suppression as an emotion regulation strategy was associated with increased incidence of crying behaviour. This idea is further supported by findings presented in chapter 3, where young participants (younger than 11 years of age) were more likely to cry every day if they frequently engaged in emotional suppression and older participants were less likely to cry every day if they used reappraisal to regulate emotions. The difference between the age groups may be related to cognitive development; perhaps effective reappraisal requires greater complexity of thought than younger participants are capable of. This has been suggested in a brain-imaging study reported on by McCrae et al. (2012) that found an increase in activation of areas in the brain associated with reappraisal as age increased from childhood through adolescence to young adulthood. Therefore, cognitive reappraisal is less successful for younger participants and they are more likely to use suppression instead. Chapter 5 further explored the role of emotion regulation in crying behaviour, showing that in a proportion of cases, crying leads to improved mood, which suggests that crying itself can act as an

emotion regulation strategy in certain circumstances, tying into the cathartic conceptualization of crying (Becht & Vingerhoets, 2002; Bylsma et al., 2008; Efran & Spangler, 1979; Stougie et al., 2004; Wood & Wood, 1984). Furthermore, trying to stop oneself from crying predicted poorer mood in the three days following crying, indicating that crying may allow emotional recovery.

To date, few studies have examined emotional experience leading up to and following crying. The predominant research within this area is based on the concept of catharsis (Efran & Spangler, 1979; Wood & Wood, 1984) and has typically measured whether mood is improved after crying rather than examining the components of mood (Bylsma et al., 2008; Rottenberg, Bylsma, & Vingerhoets, 2008). The literature suggests that adults cry due to grief, joy, fear, pain, anger, sorrow (Sadoff, 1966) guilt, frustration (Miceli & Castelfranchi, 2003) and shame (Becht & Vingerhoets, 2002), but most of these suggestions lack substantiating research. Additionally, few studies have examined the emotions associated with crying in adolescence, despite the emotional turbulence expected in that period (Yurgelun-Todd, 2007). The results presented in chapter 4 show that male adolescents were more likely to cry if they were sad and less likely to cry if they felt restless. Females were more likely to cry if they felt sad and less likely to cry if they felt fearful. The reduced likelihood of crying when fearful may be a form of acute stress response (flight-or-fight) where the situation is perceived as too dangerous to increase vulnerability by crying and other behaviours related to survival are prioritised.

Male adolescents were more likely to try to stop themselves from crying if they were bad tempered and less likely to if they were feeling restless. Furthermore, females were more likely to try to stop themselves from crying when they felt sad, irritated or nervous and less likely when they felt fearful or relaxed. There is some overlap between the results such that the likelihood of both crying and trying to stop oneself from crying in

females were increased by feelings of sadness, and in males were both decreased by feeling restless. This is because crying and trying to stop oneself from crying are both dependent on feeling like crying and are therefore likely to co-vary. These results underscore the importance of understanding the crying behaviour of males as distinct from that of females; the emotions associated with male crying behaviour, the frequency with which males try to stop themselves from crying, as well as reasons for trying to suppress crying differ significantly between the sexes. Therefore, results from studies which have only included a female sample cannot be generalised to males.

This thesis forms a foundation for future research into emotion expression, particularly crying, throughout the lifespan but is particularly notable for its contribution to the current understanding of adolescent crying behaviour. The research identifies adolescence as a distinct period of development for crying, due to the differences in the frequency and correlates for crying found in adolescents compared with those for infants, children and adults.

7.3. Aim 2: Develop a methodology to collect daily crying behaviour information

This thesis set out to develop a methodology which would provide more detailed information about crying behaviour than is available through traditional retrospective surveys. Typically, research into crying has been conducted using surveys which ask participants to estimate their crying frequency over a set time span. For example, the Adult Crying Inventory (Rottenberg, Cevaal, et al., 2008) asks participants to estimate their crying frequency over the preceding 4 weeks. The benefit of this approach is that it allows for data to be collected from very large samples of participants, as they need only fill in one survey, but the data that this method yields are subject to limitations which this thesis aimed to address.

The estimates of crying frequency yielded by traditional survey approaches rely on the accuracy of the participant's memory, which may be faulty or subject to retrospective bias (Bylsma et al., 2011). Furthermore, results from these surveys will only ever be able to link crying frequency with personal variables because they are unable to collect information about how proximal events and changes in mood affect crying behaviour. In the present research, a daily diary was used to gather the information which provided data for chapters 4, 5 and 6 of this thesis and describes the emotional experience of crying, the reasons for crying and enables the analysis of how different types of crying behaviour relate to proximal factors.

This daily diary was sent to 56 participants with the prospect of being reimbursed \$40 for their time in filling out the survey; 13 males and 29 females returned the diary producing a completion rate of 65% and 81% respectively.

Chapters 4, 5 and 6 provided examples of the types of analyses that the diary methodology allows. This contrasts with chapter 3 which involved data obtained through a traditional retrospective survey. In chapter 3, crying proneness of individuals was related to their personal characteristics, such as tendencies towards shame and use of emotion regulation strategies. The diary methodology allowed information to be gathered on transient factors such as mood, easily forgotten factors such as crying intensity, as well as the social and situational context and perceived reasons for crying.

Chapter 4 related crying behaviour to situational factors such as who was present, where the participant was located and whether females were menstruating. It also allowed for more detailed information regarding the frequency with which participants cried to be collected. In retrospective surveys, participants may have difficulty remembering how many times they cried so this diary methodology allowed a more accurate account of crying frequency to be recorded. It was evident that the reported frequency with which

participants cried was higher than that obtained through retrospective surveys for females, though not males. The elevated frequency recorded in this study may be attributed to differences between adolescent and adult crying frequency or to differences caused by using the diary method rather than surveys to collect data. This study showed greater difference in female crying frequency than male crying frequency which may be related to the relative frequencies with which the genders cry. Females cry more frequently, therefore they are more likely to cry multiple times on a single day which is not detected using typical crying inventories. As males cry less frequently, they are less likely to cry multiple times a day and therefore a smaller difference in identified crying frequency is expected.

Chapter 5 examined how crying behaviour can be explained using emotion regulation and attachment conceptualizations. Emotion regulation was investigated by comparing mood on the three days that followed crying days with mood on the three days that followed non-crying days. Additionally, chapter 5 reported perceived mood change after crying, which was recorded by participants on days on which they cried. This allowed information about the cathartic properties of crying to be gathered in a detailed manner regarding 'real life' crying episodes, where many previous studies regarding catharsis have been limited in that laboratory-induced crying does not seem to induce cathartic responses (Bylsma et al., 2011). By collecting data on crying behaviour as it occurred naturally, a more representative view of catharsis was able to be obtained. Additionally, the diary format allows the enduring impact of catharsis to be examined, a novel development in catharsis research.

The diary methodology allowed information regarding who was present during crying episodes to be collected, a detail which is not possible in retrospective surveys where the

number of crying episodes over a particular time span is estimated. This allowed for an investigation of how social context relates to crying behaviour.

The main innovation described in chapter 6 was the delineation of a number of different types of crying. By collecting information about the reasons participants identified as contributing to each crying episode, it was possible to isolate groupings of reasons and thereby distinguish between different types of crying behaviour. Information regarding specific crying episodes was necessary to identify different types of crying, such as depressive and joyful, highlighting the comparative utility of this method when compared to traditional retrospective survey methodologies.

The results gathered for this thesis using the daily diary methodology have the potential to form the basis of future research into adolescent crying as well as crying in other developmental groups. The diary methodology could be extended to developmental groups meeting the same cognitive capacity of adolescents. This method of data collection allows for conceptualizations which were previously unable to be studied to be investigated and evaluated, thereby increasing the scope of crying research. It is a versatile tool and could be adapted to include items which are relevant to a range of research applications. Furthermore, the focus of the diary could be shifted away from crying and thereby provide a useful contribution to other fields typified by irregular, episodic elements such as interpersonal conflict, occupation specific tasks like providing feedback to employees, or consumption of alcohol.

The use of the diary methodology to study crying behaviour across all developmental periods has the potential to further advance understanding of crying behaviour. Future research should focus on these developments as well as utilising similar daily diary methodologies to study other behaviours, particularly clinically relevant behaviours such as school refusal, non-suicidal self-injury, or suicidal ideation.

7.4. Aim 3: To provide formative data on proposed conceptualizations of crying

The third aim of this thesis was to investigate how well the crying behaviour of adolescents reflects current conceptualizations of crying. Of particular note, several of these conceptualizations may be able to provide a framework for studying crying behaviour in future research: the social and attachment conceptualizations (Hendriks, Nelson, et al., 2008; Hill & Martin, 1997), the emotion regulation conceptualization (Gross, 2002), and the helplessness conceptualization (Miceli & Castelfranchi, 2003) which were explored in chapters 5 and 6 of this thesis.

As discussed in chapters 2, 5 and 6, attachment theory regards crying behaviour as a way of gaining assistance and forming social bonds. There is evidence that this function, well studied in infancy (Bowlby, 1969; Bowlby, 1982), continues into adulthood, inciting empathy and understanding in others (Hendriks, Croon, et al., 2008). This has been posited to be particularly the case in one-on-one situations where the support of others has been shown to increase the likelihood of catharsis following crying in adult populations (Bylsma et al., 2011). It is notable, then, that evidence presented in chapter 5 which examined the relevance of emotion regulation and attachment conceptualizations of crying demonstrates no support for a social conceptualization of crying, with the number or type of people present during a cry showing no significant effect on mood after crying. Additionally, participants frequently cried alone, this behaviour serving no obvious social or attachment function. Evidence that crying acts as a mechanism for emotion regulation in adolescence, however, is more convincing.

As discussed in chapters 2, 3 and 5, emotion regulation is a construct describing the skill with which individuals regulate their experience and expression of emotions, and the strategies they employ to do this (Gross & John, 2003). Two strategies have received the vast majority of scientific attention: suppression and reappraisal (Gross & John, 2003).

Both reappraisal and suppression are considered to be primarily explicit emotion regulation strategies; actively engaged in by an individual experiencing an unwanted emotion (Gyurak, Gross, & Etkin, 2011). Recently, there has been a greater scientific interest in implicit emotion regulation; those strategies which are implemented without conscious thought (Gyurak et al., 2011). Given the oft-proposed cathartic properties of crying (Bylsma et al., 2011, 2008; Martin & Labott, 1991; Stougie et al., 2004), the possibility of crying functioning as an implicit emotion regulation strategy is of particular interest.

Chapter 3 presents data supporting significant correlations between crying proneness and both reappraisal and suppression. The way in which these correlations changed between childhood and adolescence suggests that crying may be used as an emotion regulation strategy in concert with suppression and reappraisal. Chapter 5 examined the role of crying as emotion regulation by examining its cathartic properties; if crying can improve mood it could legitimately be seen as an emotion regulation strategy. The results of chapter 5 show that crying can, but does not always, result in mood improvement. This may mean that crying provides other functions depending on the circumstance and the individual. Chapter 6, which examined this supposition, demonstrated support for distinct types of crying which may perform different functions and conform to different conceptualizations such as emotion regulation, empathic crying, and helpless crying.

Empathy has previously been found to be a determinant of crying behaviour in adolescent females but not males (Van Tilburg et al., 2002). This finding was partially supported by the results of chapter 3 which examined the association between individual characteristics and crying behaviour. In chapter 3 it was evident that a high level of empathy was associated with increased crying proneness in both males and females, though the result was more marked in females. Further examination of empathic crying

was undertaken in chapter 6, where it was shown that empathetic crying forms a distinct type of crying in adolescence and approached a significant relationship with sex.

Instrumental, or manipulative, reasons for crying have been proposed in infancy (Soltis, 2004), childhood (Kopp, 1992; Rottenberg & Vingerhoets, 2012) and adulthood (De Fruyt, 1997; Hendriks, Nelson, et al., 2008; Vingerhoets, Cornelius, Van Heck, & Becht, 2000). Even so, prior to this research, no studies have implicated this reason for crying behaviour in adolescents. Adults expect to be seen as manipulative when they cry, but there is no evidence that others perceive crying as manipulative in others (Hendriks, Croon, et al., 2008) and, though there are anecdotal accounts of it being used manipulatively (Bylsma, Vingerhoets, & Rottenberg, 2008; Peter et al., 2001), there is no supportive evidence. Further research is required to determine whether crying represents intent to manipulate, is unconsciously manipulative, or does not serve a manipulative function.

The Miceli and Castlefranci (2003) helplessness model which considers the central cognitive mechanism in crying to be the perception that an individual cannot cope with a difficult situation, in which case they mentally ‘give up’ and this is accompanied by crying. Chapter 6 provides the first empirical insight into this model by showing that one of the ‘types’ of crying is associated with feeling hopeless and powerless.

7.5. Practical Applications

The results of this thesis suggest certain practical applications, such as teaching emotion regulation skills as a way of easing the transition between childhood (where people depend on their parents for emotion regulation) and adulthood (where people self-regulate emotions). Ardana, Whelan and Melvin (unpublished manuscript) found that crying is less likely to lead to mood improvement when in conjunction with depressive symptoms and more likely when adolescents use reappraisal. Therefore, teaching

adolescents emotion regulation techniques such as reappraisal may have a compound effect on their recovery from major mental illness, improving currently recognised methods of emotion regulation as well as commensurately increasing the regulatory capacity of crying. Extension of this work into clinical samples will further clarify the utility of crying as an emotion regulator.

Interpreting crying as a strategy for regulating emotions may also increase the use of crying items in inventories which measure emotion regulation or any form of emotional distress or coping mechanisms. This also has implications for the interpretation of crying items on depression and anxiety inventories. If crying behaviour is conceptualised as a positive emotion regulation strategy in some instances, frequency of crying may be seen as an indication of mental wellbeing rather than necessarily indicative of depression, but perhaps more so for females than males. Though further work in this area is needed to clarify the relationship between crying and mental illness, the research in this thesis clearly points towards emotion regulation being a meaningful theory in which to consider crying behaviour.

7.6. Limitations

This thesis provides significant insights into adolescent crying as well as discussing a new methodology for collecting information on crying behaviour. Nonetheless, the findings are subject to certain limitations. First, the age range of participants and the sample size achieved limit the extent to which the findings of the thesis can be linked to changes in development. Participants in these studies were in the late childhood and adolescent developmental phases, limiting the extent to which results can be generalised to other developmental groups.

In chapter 3 the sample size was high and participants ranged in age between 9 and 16 years which allowed changes in crying behaviour to be associated with age (and

development). However, chapters 4-6 focussed on a sample of adolescents aged between 12 and 18 years without focus on the changes across this developmental phase. A larger sample size would allow for more inferences to be drawn about how crying behaviour changes throughout adolescence, particularly in developing more robust typologies of crying. However, a limitation of the diary method is the time and cost that would be associated with obtaining such a large sample (e.g., Jellesma & Vingerhoets, 2012; Rottenberg et al., 2008; Van Tilburg et al., 2002). A digital version of the diary may mitigate this somewhat by increasing accessibility and reducing burden. This type of alteration may be particularly important in clinical populations with certain disorders which affect motivation, such as major depressive disorder. In addition, the cognitive requirements of the diary mean that it is currently inaccessible to some populations such as infants, children and individuals with marked dyslexia or intellectual disability. Alterations could be made to the diary to allow for parent/caregiver elicitation and interpretation and allow this methodology to extend to these groups.

Though this thesis set out to validate the major conceptualizations for why we cry, some are highly complex (e.g., Labott & Martin, 1988) and would require specialised data collection or experimental procedures. Excluding these proposed explanations of crying limits the scope of the thesis to the conceptualizations that lend themselves to empirical operationalization. Similarly, though attachment theory is thought to have potential in explaining crying behaviour and was investigated in this thesis, the data collected are not sufficient to fully substantiate or refute this theory. The lack of significant findings for this relationship is largely attributed to limitation in the data; no information was collected regarding the nature of interactions which accompanied crying behaviour. As the nature of interactions surrounding crying have previously been found to be important in predicting mood change after crying (Bylsma et al., 2008), future research

which allows for interactions to be categorised as aligning within one of the established attachment typologies would be useful (e.g., Bartholomew & Horowitz, 1991).

Finally, it should be noted that the novel crying diary developed for this thesis has not undergone rigorous psychometric testing. It would be difficult to measure the reliability or validity of the measure due to the expected variability in crying episodes of but it may be possible to utilise interview questions to compare the ratings of a recent episode of crying to an external person's perspective and provide a form of external validity. Similarly, having participants rate an episode of crying at the time it occurs, as well as several hours or days later may provide for a form of reliability assurance. If future research were able to clarify the psychometric properties of this form of investigation, it may provide methods of refining it as well as more clearly identifying limitations.

7.7. Novelty and Contribution to Research

When this thesis was submitted, only two published articles (Jellesma & Vingerhoets, 2012; Van Tilburg et al., 2002) and one unpublished article (Ardana et al., unpublished manuscript) considered crying behaviour in adolescence. The majority of literature to date concerns crying in either infancy or adulthood where vastly different perspectives are taken. Chapter 3 demonstrates that as children age through adolescence, the personal factors associated with crying behaviour change. Chapters 4, 5, and 6 investigate the reasons for crying in adolescents aged 12 and over, which show characteristics similar to those previously shown in adult crying behaviour. Together this evidence suggests crying behaviour develops significantly through late childhood and early adolescence.

The question of when the sex difference arises in crying behaviour is vital to developmental stages of crying through the lifespan. A number of studies have shown there is little established sex difference in infancy (Campbell & Eaton, 1999; Camras et al., 1998; Van Ijzendoorn & Hubbard, 2010) while the sex difference in crying frequency

of adults is well documented (De Fruyt, 1997; Hastrup et al., 1986; Lombardo et al., 2002). To date, no study had been able to identify at what point this sex difference arose. The results of chapter 3 show that children younger than 11 years did not display a sex difference in crying propensity but a significant sex difference is observable in older individuals. Chapters 4, 5, and 6 include data on adolescents over 11 years of age and investigate nuanced differences in crying behaviour between the sexes.

Prior to this thesis, many conceptualizations of crying behaviour existed but none had been adequately evaluated using empirical data (see Labott & Martin, 1988 for an example of inadequate empirical evaluation). This thesis is the first work to empirically evaluate multiple major conceptualizations of crying behaviour. It finds evidence for the conceptualization based on emotion regulation in chapters 3, 5, and 6, the helplessness conceptualization in chapter 6, and the conceptualization based on empathy in chapters 3 and 6, but no evidence to support social communication or manipulative conceptualizations of crying.

Chapters 3, 4, and 5 indicated that current conceptualizations of crying might have been inadequate to explain all the crying episodes observed in the participants of the daily diary study. Some proposals found support but no conceptualization explained all of the observed crying behaviour. Therefore, chapter 6 posited that there may be different types of crying which serve different purposes and each type might be explained by different conceptualizations of crying. Although the data were insufficient to provide certainty around crying types, the results were similar to those from a speculative study of reasons for crying proneness (Denckla et al., 2014) and provide the promising evidence that crying serves different purposes depending on context.

7.8. Concluding Remarks

The literature on crying is limited and many areas are still unexplored. The processes and outcomes of this thesis can provide a springboard into future research by providing new perspectives and suggesting new areas of research. Specifically, the research highlights the usefulness of the diary methodology for collecting rich data on crying behaviour and sheds light on why we cry. This thesis outlines a number of types of crying and discusses how these relate to existing conceptualizations of crying, adding to our understanding of crying behaviour in adolescence. The present thesis has taken fundamental steps in understanding adolescent crying which will pave the way for future research.

7.9. References

- Ardana, H., Whelan, T., & Melvin, G. (unpublished manuscript). Crying behaviour in adolescence: gender, mood and emotion regulation. *In Prep.*
- Bartholomew, K., & Horowitz, L. M. (1991). Attachment styles among young adults: A test of a four-category model, *Journal of Personality and Social Psychology*, *61*(2), 226–244.
- Becht, M. C., & Vingerhoets, A. J. J. M. (2002). Crying and mood change: A cross-cultural study. *Cognition & Emotion*, *16*(1), 87–101.
- Bylsma, L. M., Croon, M. a., Vingerhoets, A. J. J. M., & Rottenberg, J. (2011). When and for whom does crying improve mood? A daily diary study of 1004 crying episodes. *Journal of Research in Personality*, *45*(4), 385–392.
- Bylsma, L. M., Vingerhoets, A. J. J. M., & Rottenberg, J. (2008). When is crying cathartic? An international study. *Journal of Social and Clinical Psychology*, *27*(10), 1165–1187.
- Campbell, D. W., & Eaton, W. O. (1999). Sex differences in the activity level of infants. *Infant and Child Development*, *8*, 1–17.
- Camras, L. A., Oster, H., Campos, J., Campos, R., Ujiie, T., Miyake, K., ... Meng, Z. (1998). Production of emotional facial expressions in European American, Japanese, and Chinese infants. *Developmental Psychology*, *34*(4), 616–28.
- De Fruyt, F. (1997). Gender and individual differences in adult crying. *Personality and Individual Differences*, *22*(6), 937–940.
- Denckla, C. A., Fiori, K. L., & Vingerhoets, A. J. J. M. (2014). Development of the Crying Proneness Scale: Associations among crying proneness, empathy, attachment, and age. *Journal of Personality Assessment*, *96*(6), 619–31.
- Efran, J. S., & Spangler, T. J. (1979). Why grown-ups cry. *Motivation and Emotion*, *3*(1), 63–72.

- Gross, J. J. (2002). Emotion regulation: Affective, cognitive, and social consequences. *Psychophysiology*, *39*(3), 281–91.
- Gross, J. J., & John, O. P. (2003). Individual differences in two emotion regulation processes: Implications for affect, relationships, and well-being. *Journal of Personality and Social Psychology*, *85*(2), 348–362.
- Hasson, O. (2009). Emotional tears as biological signals. *Evolutionary Psychology*, *7*(3), 363–370.
- Hastrup, J. L., Baker, J. G., Kraemer, D. L., & Bornstein, R. F. (1986). Crying and depression among older adults. *The Gerontologist*, *26*(1), 91–6.
- Hendriks, M. C. P., Croon, M. a, & Vingerhoets, A. J. J. M. (2008). Social reactions to adult crying: The help-soliciting function of tears. *The Journal of Social Psychology*, *148*(1), 22–41.
- Hendriks, M. C. P., Nelson, J. K., Cornelius, R. R., & Vingerhoets, A. J. J. M. (2008). Why crying improves our well-being: An attachment-theory perspective on the functions of adult crying. In A. J. J. M. Vingerhoets, I. Nyklíček, & J. Denollet (Eds.), *Emotion regulation* (pp. 87–96). New York: Springer.
- Hill, P., & Martin, R. B. (1997). Empathic weeping, social communication, and cognitive dissonance. *Journal of Social and Clinical Psychology*, *16*(3), 299–322.
- Jellesma, F. C., & Vingerhoets, A. J. J. M. (2012). Crying in middle childhood: a report on gender differences. *Sex Roles*.
- Labott, S. M., & Martin, R. B. (1988). Weeping: evidence for a cognitive theory. *Monographs of the Society for Research in Child Development*, *12*(3), 205–216.
- Lombardo, W. K., Cretser, G. A., & Roesch, S. C. (2002). For crying out loud- the differences persist into the '90s. *Sex Roles*, *45*(7/8), 529–547.

- Martin, R. B., & Labott, S. M. (1991). Mood following emotional crying: Effects of the situation. *Journal of Research in Personality*, 25(2), 218–244.
- McRae, K., Gross, J. J., Weber, J., Robertson, E. R., Sokol-Hessner, P., Ray, R. D., Gabrieli, J. D. E, & Ochsner, K. N. (2012). The development of emotion regulation: An fMRI study of cognitive reappraisal in children, adolescents and young adults. *Social Cognitive and Affective Neuroscience*, 7(1), 11–22.
- Miceli, M., & Castelfranchi, C. (2003). Crying: discussing its basic reasons and uses. *New Ideas in Psychology*, 21(3), 247–273.
- Nelson, J. K. (2008). Crying in psychotherapy: Its meaning, assessment, and management based on attachment theory. In A. J. J. M. Vingerhoets, I. Nyklíček, & J. Denollet (Eds.), *Emotion Regulation* (pp. 202–214). New York.
- Rottenberg, J., Cevaal, A., & Vingerhoets, A. J. J. M. (2008). Do mood disorders alter crying? A pilot investigation. *Depression and Anxiety*, 25(5), E9–15.
- Stougie, S., Vingerhoets, A. J. J. M., & Cornelius, R. R. (2004). Crying, catharsis and health. In I. Nyklíček, L. Temoshok, & A. J. J. M. Vingerhoets (Eds.), *Emotional expression and health: Advances in theory, assessment and clinical applications* (pp. 1–17). New York: Brunner-Routledge.
- Van Ijzendoorn, M., & Hubbard, F. (2010). Are infant crying and maternal responsiveness during the first year related to infant-mother attachment at 15 months? *Attachment & Human Development*, 2(3), 371–391.
- Van Tilburg, M. A. L., Unterberg, M. L., & Vingerhoets, A. J. J. M. (2002). Crying during adolescence: The role of gender, menarche, and empathy. *British Journal of Developmental Psychology*, 20(1), 77–87.
- Wood, E. C., & Wood, C. D. (1984). Tearfulness: A psychoanalytic interpretation. *Journal of the American Psychoanalytic Association*, 32(1), 117–136.

Yurgelun-Todd, D. (2007). Emotional and cognitive changes during adolescence. *Current Opinion in Neurobiology*, 17(2), 251–7.

Appendices

Appendices for chapter 3

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Appendix A: Emotions project ethics approval

11 June 2003



Assoc. Prof. Eleonora Gullone, Assoc. Prof. Neville King and Prof. Bruce Tonge
Department of Psychology
Clayton Campus

2003/122 - Adolescent internalising disorders and self conscious emotions

Thank you for the information provided in relation to the above project. The items requiring attention have been resolved to the satisfaction of the Committee. Accordingly this research is approved to proceed.

Terms of approval

The project is approved as submitted for a three year period from the date of this letter and this approval is only valid whilst you hold a position at Monash University. You should notify the Committee immediately of any serious or unexpected adverse effects on participants or unforeseen events that might affect continued ethical acceptability of the project. Any changes to the research protocol require the submission and approval of an amendment. Substantial variations may require a new application. Please quote the project number above in any further correspondence and include it in the complaints clause which must be included in the explanatory statement and may be expressed more formally if appropriate:

You can complain about the study if you don't like something about it. To complain about the study, you need to phone +61 3 9905 2052. You can then ask to speak to the secretary of the Human Ethics Committee and tell him or her that the number of the project is _____. You could also write to the secretary. That person's address is:

*The Secretary
The Standing Committee on Ethics in Research Involving Humans
Building 3d, Monash University, Victoria 3800
Telephone + 61 3 9905 2052 Fax + 61 3 9905 1420
Email: SCERH@adm.monash.edu.au*

Progress reports

Continued approval of this project is dependent on the submission of annual progress reports and a termination report. Please ensure that the Committee is provided with an annual report by 20 December each year. A final report should be provided at the conclusion of the project. The Committee should be notified if the project is discontinued before the expected date of completion. The report form is available at <http://www.monash.edu.au/resegrant/human-ethics/forms-reports/index.html>.

Retention and storage of data

The Chief Investigators of approved projects are responsible for the storage and retention of original data pertaining to a project for a minimum period of five years. You are requested to comply with this requirement.



Dr Andrea Lines
Human Ethics Officer
Standing Committee on Ethics in Research Involving Humans

RESEARCH GRANTS AND
ETHICS BRANCH

Appendix B: Emotions project explanatory statement for parents/guardians

M O N A S H U N I V E R S I T Y



Emotions and their relationship to Internalising Behaviours in Young People

Explanatory Statement for Parents/Guardians

Your child is invited to participate in a research project that is outlined below. Thank you for taking the time to read this Explanatory Statement.

Who is conducting this research project?

This research is being conducted through the Department of Psychology at Monash University, and is being supported by a grant from the Australian Research Council.

What is the research project about?

We all experience feelings of sadness, distress and anxiety from time to time. This project investigates how these depressive-type feelings relate to emotions such as guilt and empathy in the general population of children and adolescents. Therefore anyone between the ages of 9 and 14 is free to participate. We also want to investigate how other factors, such as parenting style, might influence these relationships.

Why do we need to do this research?

Unfortunately, adolescent depression is a very prevalent mental health problem that is on the increase, as today's youth face a variety of pressures. Once diagnosed, adolescent depression often continues through into adulthood, and has been linked to substance abuse, eating disorders and suicide.

By developing a better understanding of the relationships between depressive-type feelings and other emotions during the formative years, we will be in a better position to develop preventative strategies. This will enable us to step in *before* problems develop.

Why is my child being asked to participate?

We are looking for students between the ages of 9 and 14 years who are representative of the general Australian population. In addition, we will be recruiting participants of Vietnamese origin so that we can compare our results across cultures.

What will my child be required to do?

This study will continue over three years, however we will require each student's participation only once in each of these three years. On each occasion, your child will be asked to complete a number of questionnaires. Completion of all the questionnaires on any one occasion will take about one hour. A list of the questionnaires to be used is attached (page 5), and full copies of the questionnaires will be available at your child's school.

When and where will these measures be administered?

These measures will be administered at your child's school during regular class hours. In the event that your child changes schools during the course of the study, we will arrange for a mutually convenient location to be used (preferably at the new school).

What are the possible risks for my child?

In our previous work using these measures we have found it is unlikely that any distress will occur during your child's participation in the study. However, if any child becomes upset, their involvement will cease immediately and they will be given the opportunity to talk to their teacher or another suitably qualified person from their school.

Can my child or I be identified through this study? Will the information be confidential?

Should you decide to participate, all information will be collected on a coded basis so that identifying information will be stored separately from the other information your child provides. All of our results will be reported in purely statistical terms without reference to any individual child, family, or school. The collected information will be securely stored in locked filing cabinets within a non-public area of the Department of Psychology, and in password protected electronic files. This information will only be accessible to the researchers involved in this study. By Law, must keep this documentation for five years.

Please note that one of the questionnaires enables us to determine whether your child is at risk of psychological distress. If we find that your child's score indicates the possibility of concern, we will recommend to the school principal that further assessment be sought. It is important to note that the information obtained is *only* indicative of possible distress. No firm conclusions should be based on it.

How will I find out about the results of the study?

Feedback relating to the overall study findings will be made available through your school principal once the study is completed. In addition, we will send you an annual newsletter with up-dates about the progress of the study. Again, these findings will be reported *only* on a group basis so that there is no way any individual's responses will be identifiable. Application to gain access to your child's data maybe made in accordance with the relevant provisions of the Privacy Act.

Where to from here?

How can I indicate that I would like my child to be involved?

If you would like to be involved, please complete and return the appropriate section (marked **YES**) on the attached 'Informed Consent Form' (page 4) to indicate your consent for your child to participate in this research. You will notice that we also ask a few questions about yourself on the consent form. If you consent to your child's participation please answer these questions.

All children who receive parental consent will be presented with their own consent form before we involve them in the research. Even if they agree to be involved, they will clearly be advised that they can stop at any time if they change their mind or become upset.

What if I do not want my child to be involved?

Again, we would ask that you complete and return the appropriate section (marked **NO**) on the attached 'Informed Consent Form' (page 4) indicating your desire not to be involved. This way we are aware that you have received, and considered your child's involvement.

What if I have more questions about this study?

If you have any queries regarding this research, or would like more information, please do not hesitate to contact us. Full contact details are provided at the end of this explanatory statement.

What if I have am not happy with how this research is conducted?

Should you have any complaint concerning the manner in which this research (project number 2003/133) is conducted, please do not hesitate to contact The Standing Committee on Ethics in Research Involving Humans (SCERH) at the following address:

The Secretary
The Standing Committee on Ethics in Research Involving Humans
Monash University
Wellington Road
Clayton, Victoria 3168
Telephone: (03) 9905 2052
Fax: (03) 9905 1420
Email: SCERH@adm.monash.edu.au

Thank you for taking the time to consider your child's involvement in this project.

Yours Sincerely,

Eleonora Gullone, PhD, FAPS
Associate Professor in Psychology
Department of Psychology
Monash University

For further information relating to this study, please feel free to contact the following people:

Dr Eleonora Gullone
Associate Professor
Phone: 9905 5374
Eleonora.gullone@med.monash.edu.au

Sean MacDermott
PhD Student
Phone 9905 4581
Sean.macdermott@med.monash.edu.au

Shaun Watson
PhD Student
Phone 9905 3149
Shaun.watson@med.monsah.edu.au

Or visit:

http://www.med.monash.edu.au/psych/research/emot_int_behav/

Appendix C: Emotions project consent form for parents/guardians

Informed Consent Form

Emotions and their relationship to Internalising Behaviours in Young People

Please complete only one of the following boxes, indicating that either 'YES', you give consent, or 'NO', you do not give consent, to your child's involvement.

YES. I, (Parent's/Guardian's full name), voluntarily consent to (child's full name, and date of birth), participating in the above Monash University research project.

I have read and understood the letter of explanation and know that I am free to withdraw my child at any time, and that my child is free to withdraw at any time he or she wishes. I further understand that any information provided by my child or myself is strictly confidential, and that no information that could lead to the identification of any individual will be disclosed in any reports on the project, or to any other party.

Home Address:

Postcode: Email

Telephone: (AH) (mobile) (other)

Country of birth – Parent/Guardian 1

Country of birth – Parent/Guardian 2 (if applicable)

Occupation – Parent/Guardian 1

Occupation – Parent/Guardian 2 (if applicable)

Do the family practice a religious faith or belief? (please tick) Yes No

If YES, what religion is it?

Signature: Date:

NO. I, (Parent's/Guardian's full name), **do not** consent to (Child's full name), participating in the above Monash University research project.

Signature: Date:

Appendix D: Emotions project questionnaire details

Questionnaire Details

Students will be asked to complete the following questionnaires.

- ❖ CDI – Modified. Participants are asked to select one of three statements that best describes them. For example, they are asked to select one of: "I am said once in a while"; "I am sad many times"; "I am sad all the time", and one of "I can never be as good as other kids"; "I can be as good as other kids if I want to"; "I am just as good as other kids".
- ❖ TOSCA-A. This measure of adolescent guilt and shame presents participants with various scenarios. For example, "While out with a group of friends, you make fun of a friend who is not there". In response to this scene, participants are then asked to indicate how much a number of statements are like them. Example statements include "you would apologise and talk about that persons good points", and "you would feel small... like a rat".
- ❖ IEC&A – This scale of empathy requires participants to rate how much each item is like them. Example items include: "It makes me sad to see a girl who can't find any one to play with", and "It's hard for me to see why someone else gets hurt".
- ❖ ERMY – Assesses emotion regulation by asking participants to rate the how much statements are like them. Example items include: "I am a cheerful person", and "I have trouble waiting for something I want".
- ❖ PBI – Modified – This parenting scale asks participants to rate how much statements are like their parent(s)/guardian(s). Example items include: "Is affectionate to me", and "Does not praise me".
- ❖ The "I am..." Test – This open-ended questionnaire is designed to measure how participants describe themselves. Participants are simply asked to complete the statement "I am..." a number of times with different responses.
- ❖ In addition, students will be asked to complete a sheet of demographics, to collect information on gender, age, country of birth, etc.

Appendix E: Emotions project explanatory statement for children and adolescents

M O N A S H U N I V E R S I T Y



EXPLANATORY STATEMENT FOR CHILDREN AND ADOLESCENTS

Hello,

Our names are Shaun Watson and Sean MacDermott. We are from Monash University and are at your school today because we are interested in the ways that students your age feel and think about different situations. I would like to ask you some questions about yourself, things that you like / don't like, and how you might act or feel in different situations. I also would like to ask some questions about you and your parents/guardians. The questions are not tests, so you can't get them right or wrong. However, some answers may indicate that you may benefit from support. If this applies to you, we may inform your principal so that help may be provided. Your involvement will require about one hour.

If you would like to participate, you have the choice to say yes, but if you don't, you can say no. If you say yes and start answering questions but become upset or change your mind, you can stop by putting up your hand and I will come and take the papers away.

This is a three-year study. If you agree to participate, you will be invited to participate again next year and the year after that. However, by saying yes today, you are not committing yourself for three years because we will give you the option of saying no later on if you are not interested in being involved again.

If you would like to be involved, please fill in the section below:

Informed Consent Form

I would like to be involved in this project. Yes No

My Name: _____

My Signature: _____

Today's Date: _____

Appendix F: Emotions project demographic data collection form

Demographics

Please answer the following questions about yourself and your family.

My name is ... _____

I am a ... girl boy

Today's date is ... _____

My birthday date is ... _____

My age is ... _____ years _____ months

My school is ... _____

I am in grade/year ... _____

I was born in _____ (country)

My mother was born in _____ (country)

My father was born in _____ (country)

What language/languages do you speak at home?

How long have you lived in Australia?

0-5 years 5-10 years 10-15 years always

How much have you adopted the Australian way of doing things?

not at all a little much very much

Appendix G: Test of Self Conscious Attitudes- Adolescent version (TOSCA-A)

TOSCA - A

On the following pages, you will find descriptions of a variety of situations. After each situation, you will see several statements about different ways that people might think or feel.

As you read about each situation, really imagine that you are in that situation now. Imagine how you might think or feel. Then read each statement and indicate which circle describes how much the statement is like you.

The largest circle ⑤ means that you are very likely to think or feel that way. The smallest circle ① means that you are not at all likely to think or feel that way.

EXAMPLE

A. You wake up early one morning on a school day.

	Very <u>Unlike Me</u>	A Little <u>Unlike Me</u>	Maybe (half & half)	A Little <u>Like Me</u>	Very <u>Like Me</u>
a) I would eat breakfast right away.	①	②	③	④	⑤
b) I would try to do some extra chores before starting my day.	①	②	③	④	⑤
c) I would feel like staying in bed.	①	②	③	④	⑤

There are no right or wrong answers to these questions.

We're simply interested in your own thoughts and ideas about these situations.

1. At lunchtime, you trip and spill your friend's drink.

Very Unlike Me A Little Unlike Me Maybe (half & half) A Little Like Me Very Like Me

a) I would be thinking that everyone is watching me and laughing.

①-----②-----③-----④-----⑤

b) I would feel very sorry. I should have watched where I was going.

①-----②-----③-----④-----⑤

2. You put off talking to your teacher about homework you did not finish. At the last minute you talk to the teacher about it, and all goes well.

Very Unlike Me A Little Unlike Me Maybe (half & half) A Little Like Me Very Like Me

a) I would feel sorry that I put off talking to the teacher.

①-----②-----③-----④-----⑤

b) I would feel like a coward.

①-----②-----③-----④-----⑤

3. While playing around you throw a ball and it hits your friend in the face.

Very Unlike Me A Little Unlike Me Maybe (half & half) A Little Like Me Very Like Me

a) I would feel stupid that I can't even throw a ball.

①-----②-----③-----④-----⑤

b) I would apologize and make sure my friend feels better.

①-----②-----③-----④-----⑤

4. You and a group of classmates worked very hard together on a project. Your teacher gives you a better mark than anyone else in your group.

Very Unlike Me A Little Unlike Me Maybe (half & half) A Little Like Me Very Like Me

a) I would feel alone and apart from my classmates.

①-----②-----③-----④-----⑤

b) I would tell the teacher that everyone should get the same mark.

①-----②-----③-----④-----⑤

5. You break something at a friend's house and then hide it.

- | | Very
Unlike Me | A Little
Unlike Me | Maybe
(half & half) | A Little
Like Me | Very
Like Me |
|---|-------------------|-----------------------|------------------------|---------------------|-----------------|
| a) I would think: "This is making me nervous and worried. I need to either fix it or replace it." | ① | ② | ③ | ④ | ⑤ |
| b) I would avoid seeing that friend for a while. | ① | ② | ③ | ④ | ⑤ |

6. At school, you wait until the last minute to plan a project, and it turns out badly.

- | | Very
Unlike Me | A Little
Unlike Me | Maybe
(half & half) | A Little
Like Me | Very
Like Me |
|--|-------------------|-----------------------|------------------------|---------------------|-----------------|
| a) I would feel useless. | ① | ② | ③ | ④ | ⑤ |
| b) I would feel that I deserve a bad mark. | ① | ② | ③ | ④ | ⑤ |

7. You wake up one morning and remember it's your mother's birthday. You forgot to get her something.

- | | Very
Unlike Me | A Little
Unlike Me | Maybe
(half & half) | A Little
Like Me | Very
Like Me |
|--|-------------------|-----------------------|------------------------|---------------------|-----------------|
| a) I would think: "After everything she's done for me, how could I forget her birthday?" | ① | ② | ③ | ④ | ⑤ |
| b) I would feel thoughtless and unreliable. | ① | ② | ③ | ④ | ⑤ |

8. You walk out of a test thinking you did really well. Then you find out you did badly.

- | | Very
Unlike Me | A Little
Unlike Me | Maybe
(half & half) | A Little
Like Me | Very
Like Me |
|---|-------------------|-----------------------|------------------------|---------------------|-----------------|
| a) I would feel that I should have done better. I should have studied more. | ① | ② | ③ | ④ | ⑤ |
| b) I would feel stupid. | ① | ② | ③ | ④ | ⑤ |

9. You make a mistake at school and a classmate gets the blame.

Very Unlike Me A Little Unlike Me Maybe (half & half) A Little Like Me Very Like Me

a) I would keep quiet and avoid the classmate.

①-----②-----③-----④-----⑤

b) I would feel unhappy and would want to fix the situation.

①-----②-----③-----④-----⑤

10. You were talking in class and your friend got blamed. You go to the teacher and tell him the truth.

Very Unlike Me A Little Unlike Me Maybe (half & half) A Little Like Me Very Like Me

a) I would feel like I always get people in trouble.

①-----②-----③-----④-----⑤

b) I would think: "I'm the one who should get in trouble. I shouldn't have been talking in the first place."

①-----②-----③-----④-----⑤

11. You and your friend are talking in class and you get in trouble.

Very Unlike Me A Little Unlike Me Maybe (half & half) A Little Like Me Very Like Me

a) I would think: "I should know better. I deserve to get in trouble."

①-----②-----③-----④-----⑤

b) I would feel like everyone in the class was looking at me and they were about to laugh.

①-----②-----③-----④-----⑤

12. You forget that you've made plans to meet a friend and you don't end up meeting them.

Very Unlike Me A Little Unlike Me Maybe (half & half) A Little Like Me Very Like Me

a) I would think: "I don't think about others."

①-----②-----③-----④-----⑤

b) I would try to make it up to them as soon as possible.

①-----②-----③-----④-----⑤

13. You volunteer to help raise money for a good cause. Later you want to quit, but you know your help is important.

- | | Very
Unlike Me | A Little
Unlike Me | Maybe
(half & half) | A Little
Like Me | Very
Like Me |
|--|-------------------|-----------------------|------------------------|---------------------|-----------------|
| a) I would feel selfish and I'd think I am basically lazy. | ① | ② | ③ | ④ | ⑤ |
| b) I would think: "I should be more concerned about doing whatever I can to help." | ① | ② | ③ | ④ | ⑤ |

14. Your report card isn't as good as you wanted. You show it to your parents when you get home.

- | | Very
Unlike Me | A Little
Unlike Me | Maybe
(half & half) | A Little
Like Me | Very
Like Me |
|--|-------------------|-----------------------|------------------------|---------------------|-----------------|
| a) Now that I got a bad report card, I would feel useless. | ① | ② | ③ | ④ | ⑤ |
| b) I would think: "I should listen to everything the teacher says and study harder." | ① | ② | ③ | ④ | ⑤ |

15. You've recently moved to a new school. Everyone has been very helpful, but a few times you had to ask for some big favours. You returned the favours as soon as you could.

- | | Very
Unlike Me | A Little
Unlike Me | Maybe
(half & half) | A Little
Like Me | Very
Like Me |
|--|-------------------|-----------------------|------------------------|---------------------|-----------------|
| a) I would feel like a failure. | ① | ② | ③ | ④ | ⑤ |
| b) I would be especially nice to the people who had helped me. | ① | ② | ③ | ④ | ⑤ |

Appendix H: Children's Depression Inventory (CDI)

\CDI

Young people sometimes have different feelings and ideas. This form lists feelings and ideas in groups. From each group of three sentences, pick **one** sentence that **describes you best** for the past two weeks.

There are no right or wrong answers. Just put a mark like this next to your answer. Remember, describe how you have been in the past two weeks.

Item 1

- I am sad once in a while
- I am sad many times
- I am sad all the time

Item 7

- I hate myself
- I do not like myself
- I like myself

Item 2

- Nothing will ever work out for me
- I am not sure if things will work out for me
- Things will work out for me O.K.

Item 8

- All bad things are my fault
- Many bad things are my fault
- Bad things are not usually my fault

Item 3

- I do most things O.K.
- I do many things wrong
- I do everything wrong

Item 9

- I feel like crying every day
- I feel like crying many days
- I feel like crying once in a while

Item 4

- I have fun in many things
- I have fun in some things
- Nothing is fun at all

Item 10

- Things bother me all the time
- Things bother me many times
- Things bother me once in a while

Item 5

- I am bad all the time
- I am bad many times
- I am bad once in a while

Item 11

- I like being with people
- I do not like being with people many times
- I do not want to be with people at all

Item 6

- I think about bad things happening to me once in a while
- I worry that bad things will happen to me
- I am sure that terrible things will happen to me

Item 12

- I cannot make up my mind about things
- It is hard to make up my mind about things
- I make up my mind about things easily

Item 13

- I look O.K.
- There are some bad things about my looks
- I look ugly

Item 20

- I never have fun at school
- I have fun at school only once in a while
- I have fun at school many times

Item 14

- I have to push myself all the time to do my schoolwork
- I have to push myself many times to do my schoolwork
- Doing schoolwork is not a big problem

Item 21

- I have plenty of friends
- I have some friends but I wish I had more
- I do not have any friends

Item 15

- I have trouble sleeping every night
- I have trouble sleeping many nights
- I sleep pretty well

Item 22

- My schoolwork is alright
- My schoolwork is not as good as before
- I do very badly in subjects I used to be good in

Item 16

- I am tired once in a while
- I am tired many days
- I am tired all the time

Item 23

- I can never be as good as other kids
- I can be as good as other kids if I want to
- I am just as good as other kids

Item 17

- Most days I do not feel like eating
- Many days I do not feel like eating
- I eat pretty well

Item 24

- Nobody really loves me
- I am not sure if anybody loves me
- I am sure that somebody loves me

Item 18

- I do not worry about aches and pains
- I worry about aches and pains many times
- I worry about aches and pains all the time

Item 25

- I usually do what I am told
- I do not do what I am told most times
- I never do what I am told

Item 19

- I do not feel alone
- I feel alone many times
- I feel alone all the time

Item 26

- I get along with people
- I get into fights many times
- I get into fights all the time

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**Appendix I: The Emotion Regulation Questionnaire for Children and Adolescents
(ERQ-CA)**

ERQ-CA

Below are a number of statements. Please read each statement, and then **circle the choice that seems most true for you**. Some of the statements may seem the same but they are different in important ways, so be sure to read carefully.

1. When I want to feel happier, I think about something different.	Strongly Disagree	Disagree	Half and half	Agree	Strongly Agree
2. I keep my feelings to myself	Strongly Disagree	Disagree	Half and half	Agree	Strongly Agree
3. When I want to feel less bad (e.g., sad, angry or worried), I think about something different.	Strongly Disagree	Disagree	Half and half	Agree	Strongly Agree
4. When I am feeling happy, I am careful not to show it.	Strongly Disagree	Disagree	Half and half	Agree	Strongly Agree
5. When I'm worried about something, I make myself think about it in a way that helps me feel better.	Strongly Disagree	Disagree	Half and half	Agree	Strongly Agree
6. I control my feelings by not showing them	Strongly Disagree	Disagree	Half and half	Agree	Strongly Agree
7. When I want to feel happier about something, I change the way I'm thinking about it.	Strongly Disagree	Disagree	Half and half	Agree	Strongly Agree
8. I control my feelings about things by changing the way I think about them.	Strongly Disagree	Disagree	Half and half	Agree	Strongly Agree
9. When I'm feeling bad (e.g., sad, angry, or worried), I'm careful not to show it.	Strongly Disagree	Disagree	Half and half	Agree	Strongly Agree
10. When I want to feel less bad (e.g., sad, angry, or worried) about something, I change the way I'm thinking about it.	Strongly Disagree	Disagree	Half and half	Agree	Strongly Agree

Appendix J: Index of Empathy for Children and Adolescents

IEC&A

Please read the following statements and **circle** the response which is **most true for you**.

Do not spend too much time on any one item.

Remember, this is not a test. There are no right or wrong answers.

1. It makes me sad to see a girl who can't find anyone to play with.	Strongly Disagree	Disagree	Agree	Strongly Agree
2. People who kiss and hug in public are silly.	Strongly Disagree	Disagree	Agree	Strongly Agree
3. Boys who cry because they are happy are silly.	Strongly Disagree	Disagree	Agree	Strongly Agree
4. I really like to watch people open presents, even when I don't get a present myself.	Strongly Disagree	Disagree	Agree	Strongly Agree
5. Seeing a boy who is crying makes me feel like crying.	Strongly Disagree	Disagree	Agree	Strongly Agree
6. I get upset when I see a girl being hurt.	Strongly Disagree	Disagree	Agree	Strongly Agree
7. Even when I don't know why someone is laughing, I laugh too.	Strongly Disagree	Disagree	Agree	Strongly Agree
8. Sometimes I cry when I watch TV.	Strongly Disagree	Disagree	Agree	Strongly Agree
9. Girls who cry because they are happy are silly.	Strongly Disagree	Disagree	Agree	Strongly Agree
10. It's hard for me to see why someone else gets upset.	Strongly Disagree	Disagree	Agree	Strongly Agree

11. I get upset when I see an animal being hurt.	Strongly Disagree	Disagree	Agree	Strongly Agree
12. It makes me sad to see a boy who can't find anyone to play with.	Strongly Disagree	Disagree	Agree	Strongly Agree
13. Some songs make me so sad I feel like crying.	Strongly Disagree	Disagree	Agree	Strongly Agree
14. I get upset when I see a boy being hurt.	Strongly Disagree	Disagree	Agree	Strongly Agree
15. Grown-ups sometimes cry even when they have nothing to be sad about.	Strongly Disagree	Disagree	Agree	Strongly Agree
16. It's silly to treat dogs and cats as though they have feelings like people.	Strongly Disagree	Disagree	Agree	Strongly Agree
17. I get mad when I see a classmate pretending to need help from the teacher all the time.	Strongly Disagree	Disagree	Agree	Strongly Agree
18. Kids who have no friends probably don't want any.	Strongly Disagree	Disagree	Agree	Strongly Agree
19. Seeing a girl who is crying makes me feel like crying.	Strongly Disagree	Disagree	Agree	Strongly Agree
20. I think it is funny that some people cry during a sad movie or while reading a sad book.	Strongly Disagree	Disagree	Agree	Strongly Agree
21. I am able to eat all my cookies even when I see someone looking at me wanting one.	Strongly Disagree	Disagree	Agree	Strongly Agree
22. I don't feel upset when I see a classmate being punished by a teacher for not obeying the school rules.	Strongly Disagree	Disagree	Agree	Strongly Agree

Appendix K: Parental Bonding Instrument (PBI)

Parental Bonding Instrument

MOTHER FORM

This questionnaire lists various attitudes and behaviours of parents. As you remember your MOTHER in your first 16 years would you place a tick in the most appropriate box next to each question.

	Very like	Moderately like	Moderately unlike	Very unlike
1. Spoke to me in a warm and friendly voice	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Did not help me as much as I needed	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Let me do those things I liked doing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Seemed emotionally cold to me	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Appeared to understand my problems and worries	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Was affectionate to me	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Liked me to make my own decisions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. Did not want me to grow up	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. Tried to control everything I did	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. Invaded my privacy	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. Enjoyed talking things over with me	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12. Frequently smiled at me	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13. Tended to baby me	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14. Did not seem to understand what I needed or wanted	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15. Let me decide things for myself	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16. Made me feel I wasn't wanted	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17. Could make me feel better when I was upset	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18. Did not talk with me very much	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
19. Tried to make me feel dependent on her/him	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
20. Felt I could not look after myself unless she/he was around	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
21. Gave me as much freedom as I wanted	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
22. Let me go out as often as I wanted	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
23. Was overprotective of me	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
24. Did not praise me	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
25. Let me dress in any way I pleased	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

FATHER FORM

This questionnaire lists various attitudes and behaviours of parents. As you remember your FATHER in your first 16 years would you place a tick in the most appropriate box next to each question.

	Very like	Moderately like	Moderately unlike	Very unlike
1. Spoke to me in a warm and friendly voice	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Did not help me as much as I needed	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Let me do those things I liked doing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Seemed emotionally cold to me	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Appeared to understand my problems and worries	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Was affectionate to me	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Liked me to make my own decisions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. Did not want me to grow up	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. Tried to control everything I did	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. Invaded my privacy	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. Enjoyed talking things over with me	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12. Frequently smiled at me	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13. Tended to baby me	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14. Did not seem to understand what I needed or wanted	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15. Let me decide things for myself	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16. Made me feel I wasn't wanted	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17. Could make me feel better when I was upset	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18. Did not talk with me very much	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
19. Tried to make me feel dependent of her/him	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
20. Felt I could not look after myself unless she/he was around	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
21. Gave me as much freedom as I wanted	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
22. Let me go out as often as I wanted	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
23. Was overprotective of me	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
24. Did not praise me	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
25. Let me dress in any way I pleased	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Appendix L: Additional tables from Chapter 3

Table L1.

Spearman's Rho correlation coefficients for all variables considered for entry into logarithmic regression analysis. Variables are either demographic variables or aggregates of responses to pen and paper inventories and questionnaires.

	Gender	Age	Depressive Tendency	Empathy	Emotional Reappraisal	Emotional Suppression	Shame	Guilt	Externalizing	Parental Care	Parental Overprotectio n
Feeling like Crying	-.14*	.12*	.41*	.18*	-.12*	.05*	.16*	.04	.02	-.17*	.15*
Gender		-.09*	-.02	.36*	-.05	.17*	-.10*	.21*	.16*	-.09*	.01
Age			.05	.22*	-.11*	-.19*	-.02	.08*	.07*	.00	-.12*
Depressive Tendency				-.13*	-.27*	.23*	.35*	-.16*	.27*	-.43*	.38*
Empathy					.13*	-.25*	.03	.38*	.32*	.21*	-.10*
Emotional Reappraisal						.03	.01	.32*	.09*	.21*	-.12*
Emotional Suppression							.22*	-.06*	.17*	-.25*	.22*
Shame								.29*	.27*	-.18*	.27*
Guilt									.33*	.24*	-.05
Externalizing										-.23*	.16*
Parental Care											-.48*

*Note: Correlation coefficients marked with an * denote significant relationships ($p < .05$).*

Appendix M: Advertisement flier for crying diary component

MONASH University



**Why do we cry?
When do we cry?
How do we cry?**



“We cry when we’re hurt and when onion is in our eyes,
We cry when we feel low and when we feel high,
We cry when we laugh and when we say ‘Goodbye’,
And sometimes we cry and we don’t know why!”



Though crying is an almost universal human experience, we know very little about how and why it happens. This is particularly true in young people. The Emotions Project of Monash University is currently conducting a study with young people aged between 12 and 18 years that is designed to provide information about this fascinating human behaviour. So, if you’re a young lady or gentleman aged between 12 and 18 years old, or you know someone who is, and you want to learn more about crying and help others learn more too, please take one of tags at the bottom of this flyer and contact us at the Emotions Project or email me at Maxwell.J.Fraser@monash.edu for more information! Participants will be reimbursed \$40 for their time in taking part of this study.



Crying Diary Emotions Project, Monash University emotions.project.psychology@monash.edu.au								
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Appendix N: Crying Diary Consent & Explanatory Letter (School) component

MONASH University

2013
Principal Letter



Emotions Project

Emotional Development and Wellbeing in Children and Adolescents

<DATE>

Dear <Principal's Name>,

Thank you for agreeing to consider your school's involvement in the Emotions Project, a research study being conducted by the School of Psychology and Psychiatry at Monash University. The Emotions Project has been going for six years and has involved over 1,400 children from over 120 schools across Victoria. From this project we have learned a great deal about how children's emotions develop and how emotions affect children's overall wellbeing. This information has been presented at scientific conferences and is being published in scientific journals so that other professionals who work with children can better understand their emotional development.

Should you agree to your school's participation, and dependent on parental consent, all students in Years 7-12 (under 18 years) will be invited to participate in this study. Attached, please find Parent/Guardian and Child Explanatory Statements and Consent Forms and an example page from the female version of the survey method being used, a diary.

We appreciate the time taken to consider this proposal. We hope that you will recognise the value of this research and wish to participate in this project. Please don't hesitate to contact us should you have any queries. In any case, we will be in contact with you in around two weeks to discuss our proposal with you.

Sincerely,

A/Prof Eleonora Gullone
PhD
Chief Investigator

Dr Glenn Melvin
PhD
Investigator

Mr Maxwell Fraser
BPsy (Hons)
DPsych Candidate

Mr Daniel Gresham
BA (Hons)
DPsych Candidate

██████████
██

Emotions Project

Emotional Development and Wellbeing in Children and Adolescents

What is the study about?

Our previous research into the emotional development of young people has suggested that particular types of emotions and ways of understanding and controlling emotions may play an important role in psychological outcomes and everyday behaviour such as social interactions.

This research has been concerned with how young people's emotion regulation (ER) strategies are related to psychological wellbeing, and how such relationships change over the course of development (i.e. from childhood through adolescence and into young adulthood). In this phase of the study, we are investigating how ER or the way that children understand and manage their feelings relates with the way they interact with their world (e.g. communicating their feelings via crying).

What does the study involve for students?

All students in Years 7-12 (under 18 years) are invited to take part. Participating students will be asked to fill in a daily diary of their mood and crying behaviour. The diary completion will take place over 42 days and would be done at home, taking 2-10 minutes each day.

Will there be any payment for participation?

Due to the nature and level of time commitment asked of participants, each will be reimbursed \$40 for their time in the study.

Are there any risks in participating in this research?

In our previous work using these measures we have found it is unlikely that **any** distress will occur during students' participation in the study. It does however remain possible that some adolescents may find some questions distressing. Thus, if any student becomes upset, we will ask them to cease their involvement immediately. We will also give them the opportunity to talk to a suitably qualified person. In addition, we will provide contact details for organisations that may be able to assist. Some of these are listed on the cover of the questionnaire booklet

Can students withdraw from the research?

Being in this study is voluntary and students are under no obligation to consent to participation. If consent is given, we ask that participants only withdraw prior to submitting their survey to the researchers.



How will confidentiality be protected and how will data be stored?

Surveys will be marked with a code number only. This number will be recorded with personal details in a separate location. Data and identifying information will only be able to be accessed by research personnel and will not be given to persons outside of the project. A report of the study may be submitted for publication, but individual participants will not be identifiable in such a report.

Storage of the data collected will adhere to the University regulations and kept on University premises in a locked cupboard/filing cabinet for 5 years, after which it will be destroyed.

How will the school be involved?

If you agree to your school's participation, we will visit your school to provide explanatory statements and consent forms for students to take home to their parents. Consent forms will be returned by students to their class teacher. We will then return to the school to provide the diary to students who have parental consent and who give consent themselves.

We also ask that you make the enclosed questionnaires available for parental viewing should they request to so.

Will participants and the school be told of the findings?

Participants and schools will be posted an annual newsletter providing updates about the project and preliminary findings. At the end of the project, all schools will be provided a summary of the overall research findings. Summaries will be provided to participants and their parents on request. We will not report individual participants' results however each school will be provided with a summary report of their school's outcomes as compared to an aggregate report of all other participating schools.

What if a participant has a complaint?

If you have a complaint concerning the manner in which this research is being conducted, please contact:

Executive Officer
Monash University Human Research Ethics Committee (MUHREC)
Building 3e Room 111
Research Office
Monash University VIC 3800



Thank-you,

The Emotions Project Team:

Glenn Melvin, Eleonora Gullone, Maxwell Fraser, Daniel Gresham.
Please print this out of school letterhead



**Permission Letter for Emotions Project:
Emotional Development and Wellbeing in Children and Adolescents**

Today's date: _____

Associate Professor Eleonora Gullone
Building 17
School of Psychology and Psychiatry
MONASH UNIVERSITY VIC 3800

Dear Associate Professor Gullone,

Thank you for your request to recruit participants from
_____ (School name) for the above-named research.

I have read and understood the Explanatory Statement regarding the research
(Project Number: CF10/1450 - 2010000773) and hereby give permission for this
research to be conducted.

Yours Sincerely,

Signature

Your name

Your position

School of Psychology and Psychiatry
Faculty of Medicine, Nursing, and Health Sciences
Building 17, Clayton Campus
Monash University, VIC 3800
Telephone +61 3 9905 3968 Facsimile +61 3 9905 3948
www.monash.edu.au
ABN 12 377 614 012 CRICOS provider number 00008C

Appendix O: Crying Diary Consent & Explanatory (Parent)

2013

Parent/Guardian Consent Form

Emotions Project

Emotional Development and Wellbeing in Children and Adolescents

NOTE: This consent form will remain with the Monash University researcher for their records

Child's
name: _____

Child Age: _____ years

I agree that my child (named above) may take part in the Monash University research project specified above. I have had the project explained to me and I have read the Explanatory Statement, which I keep for my records.

I understand that agreeing to take part means that I am willing to allow my child to complete a daily diary about their emotions and crying behaviour.

I understand that:

- my child's participation is voluntary, that we can choose not to participate in part or all of the project, and can withdraw at any stage of the project prior to submitting the diary without being penalised or disadvantaged in any way.
- any data that the researcher extracts from the survey for use in reports or published findings will not, under any circumstances, contain names or identifying characteristics.
- any information we provide is confidential, and no information that could lead to the identification of any individual will be disclosed in any reports on the project, or to any other party.
- data from the survey will be kept in a secure storage for a period of five years and accessible only to the research team.

AGREE DO NOT AGREE

I would also like TEXT MESSAGES or EMAILS to be sent TWICE A WEEK during the study to remind my child of their diary

Parent/Guardian

Name: _____

Relationship to
child: _____

Parent/Guardian
Signature: _____

Date: _____

PLEASE COMPLETE OVER PAGE

Contact Details

Today's date: _____

Child's name: _____

Date of Birth: _____

Current school: _____ Year level: _____

Home Address: _____

Postcode: _____

Phone (home): _____ (mobile): _____

(other): _____

Parent's Email: _____

If you have provided us with consent to send a reminder email or text message, please provide the email address or mobile number on which you would like to receive them:

Reminder Mobile: _____

Reminder Email: _____

Parent/Guardian 1

Parent/Guardian 2

Name: _____

Relationship to child: *e.g. mother* _____

Occupation: _____

Country of Birth: _____

Language spoken at home: _____

Please complete the attached Consent Form for other children in your family who may wish to participate. Remember, they must be in years 7 to 12 and under 18 years.

Parent/Guardian Signature:

Date: _____

Appendix P: Consent & Explanatory (Adolescent)

MONASH University



2013
Adolescent Explanatory Statement

Emotions Project

Emotional Development and Wellbeing in Children and Adolescents

This information sheet is for you to keep.

Our names are Dr Glenn Melvin, Associate Professor Eleonora Gullone, Mr Daniel Gresham and Mr Max Fraser. We are researchers in the School of Psychology and Psychiatry at Monash University.

Why have I been chosen to participate in this research project?

You may remember that between 2012 and 2013 you took part in the Monash University Emotions Project. The Emotions Project has told us a lot about children and adolescents and their emotions and wellbeing. We are now inviting you to continue participating in the project by completing a daily diary during this year.

What is the purpose of the research?

We are doing this research to find out more about crying in young people like you. Crying, or the act of shedding tears, is something that everyone does sometimes during their life. Why we cry and how we feel afterwards are not understood at the moment and this study will provide more information that can help us understand it better.

What are the benefits of the research?

While young people are happy and healthy most of the time, there are also some kids who are angry or sad some of the time, and others who feel this way most of the time. The Emotions Project will help us understand why this happens. It will also give us some ideas about how we can help young people.

What does the research involve?

The diary will take between 2 and 10 minutes per day and will occur over a 6 week period. The diary can be completed at home and will ask questions such as "How strongly did you feel sad today?" and "If you cried, who were you with at the time?" With your consent and the consent of your parents, a short text message or email can be sent twice each week during the study to help you remember to complete the diary. This message is not required for your participation and can be discontinued at any time by contacting the research staff on [REDACTED] or asking your parents to contact us on your behalf.



Are there any risks in participating in this research?

In our work so far we have found that it is unlikely that taking part in the study will upset you. Even so, it is possible that some questions may be upsetting. If they do, you should stop and talk to someone such as your teacher or your parents. Contact information for other services is also provided on the cover of the survey including the Australian Psychological Society referral service (03 8662 3300; toll free 1800 333 497) and Kids Helpline (1800 55 1800).

Can I withdraw from the research?

Being in this study is voluntary. You do not have to take part. If you agree to take part but then change your mind, that's OK. Just let your parents or us know at any time and you are not required to complete any further diaries nor will your completed diaries be used.

How will confidentiality be protected and how will data be stored?

Your surveys will have a number on them instead of your name. Your name and other details will be kept separately so that we cannot identify you. Only people working on the Emotions Project will be able to look at your surveys. We will write a report about the study, but no one who reads it will be able to tell that you took part in the study.

Reimbursement

All participants will be reimbursed \$40 for their time and engagement with the study payable at the completion of the 6 week period upon return of the diary to the researchers.

Use of data for other purposes

Occasionally, the answers collected from this project may be used for purposes which are different from those described here. For example, the data could be used to answer a research question in a related area. If this should occur the data used will be in electronic form and no one would be able to identify you or your answers.

How can I find out about the results?

If you would like to be informed of the aggregate research findings, contact

Dr Glenn Melvin on [REDACTED] [REDACTED] [REDACTED] [REDACTED]

[REDACTED] The findings are accessible for 5 years. We will not report individual participants' results.

<p>If you would like to contact the researchers about any aspect of this study, please contact the Chief Investigator:</p>	<p>If you have a complaint concerning the manner in which this research is being conducted, please contact:</p>
<p>Glenn A. Melvin, PhD. Senior Lecturer & Psychologist Monash University Centre for Developmental Psychiatry & Psychology Building #1, 270 Ferntree Gully Rd Notting Hill 3168 Victoria AUSTRALIA [REDACTED]</p>	<p>Executive Officer Monash University Human Research Ethics Committee (MUHREC) Building 3e Room 111 Research Office Monash University VIC 3800 [REDACTED] [REDACTED] [REDACTED]</p>

Thank you.

The 'Emotions Project' Team

Glenn Melvin, Eleonora Gullone, Daniel Gresham, Max Fraser.



2013

Adolescent Consent Form

Emotions Project
Emotional Development and Wellbeing in Children and Adolescents

My name is: _____

My date of birth / /
is: _____

I agree to be involved in this Monash University research project. I have had the project explained to me. I have also read the Explanatory Statement about the project.

I understand that:

- I will be asked to answer questions about my feelings and behaviour.
- I will be asked to answer these questions in a daily diary for 6 weeks this year (2013).
- I can decide whether or not to be involved. Even if I say yes, it is ok to stop being involved if I change my mind.
- the information I give will be kept confidential. My name will not be included on the answer sheets, only a number will be used. My name will not be given to anyone who is not involved with the Monash Emotions Project.
- the information I give will be kept in a secure place at Monash University for 5 years. It will be destroyed after that.

I AGREE to be involved
I would also like to receive TEXT MESSAGES OR EMAILS twice each week during the study to help me remember to complete the diary

I DO NOT AGREE to be involved

My Signature: _____

Today's Date: _____

Appendix Q: Crying Diary Male Version

Crying Diary

Rate how strongly you felt each of these emotions today (where 1 – ‘Not at all’ and 7 – ‘Very Strongly’):

Relaxed	1	2	3	4	5	6	7
Calm	1	2	3	4	5	6	7
Sad	1	2	3	4	5	6	7
Joyful	1	2	3	4	5	6	7
Tense	1	2	3	4	5	6	7
Fearful	1	2	3	4	5	6	7
Restless	1	2	3	4	5	6	7
Irritated	1	2	3	4	5	6	7
Bad tempered	1	2	3	4	5	6	7
Nervous	1	2	3	4	5	6	7
Ready to cry	1	2	3	4	5	6	7

Did you feel like crying today? Yes No

Whether you cried or not, did you try to stop yourself from crying? Yes No

If yes, why did you try to stop yourself (please select as many as you feel appropriate)?

- You thought crying would be a silly or weak thing to do
- You were worried that others might think you're silly or weak for crying
- You didn't want others to know that you were sad/upset
- You didn't want to upset someone you were with
- Other (please specify) _____
- Other (please specify) _____

To what degree do you believe each of the following contributed to your most intense cry today (where 1 – ‘Not at all’ and 7 – ‘Very Strongly’)?

Conflict (e.g., argument with parent, fight with a friend)	1	2	3	4	5	6	7
Loss (e.g. friend moving away, relationship break up)	1	2	3	4	5	6	7
Personal failure	1	2	3	4	5	6	7
Personal rejection	1	2	3	4	5	6	7
Witnessing suffering of others	1	2	3	4	5	6	7
Positive experiences (e.g., receiving an award, winning a competition)	1	2	3	4	5	6	7
Physical condition or physical pain	1	2	3	4	5	6	7
Negative thoughts about myself (e.g. "I'm no good", "I can never do anything right")	1	2	3	4	5	6	7
Negative thoughts about others (e.g. "Nobody can be trusted", "Other people aren't fair")	1	2	3	4	5	6	7
Sadness	1	2	3	4	5	6	7
Happiness	1	2	3	4	5	6	7
Relief	1	2	3	4	5	6	7
Fear	1	2	3	4	5	6	7
Anger	1	2	3	4	5	6	7
Pity	1	2	3	4	5	6	7
Hopelessness	1	2	3	4	5	6	7

If you have not cried today, stop here. If you have cried today, please answer the following questions.

What time was your most intense cry?

____:____

Where were you?

Who, if anyone, was with you when you cried (e.g. mother, father, brother, friend, teacher, stranger, etc.)?

Roughly how long did you cry for?

Hours: ____ Minutes: ____ Seconds: ____

How intense was your crying today?

Moist Eyes Soft Sobbing

Loud Crying Whole Body Sobbing

How did you feel after you cried?

Worse Similar Better

Did you feel that your crying in some way changed the situation you were in?

Yes, made it worse

No Effect

Yes, made it better

My Participant Code is: _____

Guilt	1	2	3	4	5	6	7
Pride	1	2	3	4	5	6	7
Powerlessness	1	2	3	4	5	6	7
Sorry for myself	1	2	3	4	5	6	7
Loneliness	1	2	3	4	5	6	7
Inspiration	1	2	3	4	5	6	7
Stress	1	2	3	4	5	6	7
Feeling unable to control your feeling(s)	1	2	3	4	5	6	7
Other (please specify):	1	2	3	4	5	6	7
Other (please specify):	1	2	3	4	5	6	7
Other (please specify):	1	2	3	4	5	6	7
Other (please specify):	1	2	3	4	5	6	7
Other (please specify):	1	2	3	4	5	6	7
Other (please specify):	1	2	3	4	5	6	7
Other (please specify):	1	2	3	4	5	6	7
Other (please specify):	1	2	3	4	5	6	7

Appendix R: Crying Diary Female Version

Crying Diary

Rate how strongly you felt each of these emotions today (where 1 – ‘Not at all’ and 7 – ‘Very Strongly’):

Relaxed	1	2	3	4	5	6	7
Calm	1	2	3	4	5	6	7
Sad	1	2	3	4	5	6	7
Joyful	1	2	3	4	5	6	7
Tense	1	2	3	4	5	6	7
Fearful	1	2	3	4	5	6	7
Restless	1	2	3	4	5	6	7
Irritated	1	2	3	4	5	6	7
Bad tempered	1	2	3	4	5	6	7
Nervous	1	2	3	4	5	6	7
Ready to cry	1	2	3	4	5	6	7

Did you feel like crying today? Yes No

Whether you cried or not, did you try to stop yourself from crying? Yes No

If yes, why did you try to stop yourself (please select as many as you feel appropriate)?

- You thought crying would be a silly or weak thing to do
- You were worried that others might think you're silly or weak for crying
- You didn't want others to know that you were sad/upset
- You didn't want to upset someone you were with
- Other (please specify) _____
- Other (please specify) _____

To what degree do you believe each of the following contributed to your most intense cry today (where 1 – ‘Not at all’ and 7 – ‘Very Strongly’)?

Conflict (e.g., argument with parent, fight with a friend)	1	2	3	4	5	6	7
Loss (e.g. friend moving away, relationship break up)	1	2	3	4	5	6	7
Personal failure	1	2	3	4	5	6	7
Personal rejection	1	2	3	4	5	6	7
Witnessing suffering of others	1	2	3	4	5	6	7
Positive experiences (e.g., receiving an award, winning a competition)	1	2	3	4	5	6	7
Physical condition or physical pain	1	2	3	4	5	6	7
Negative thoughts about myself (e.g. "I'm no good", "I can never do anything right")	1	2	3	4	5	6	7
Negative thoughts about others (e.g. "Nobody can be trusted", "Other people aren't fair")	1	2	3	4	5	6	7
Sadness	1	2	3	4	5	6	7
Happiness	1	2	3	4	5	6	7
Relief	1	2	3	4	5	6	7
Fear	1	2	3	4	5	6	7
Anger	1	2	3	4	5	6	7
Pity	1	2	3	4	5	6	7
Hopelessness	1	2	3	4	5	6	7

Have you cried (i.e. shed tears or had tears in your eyes) today? Yes No

If yes, how many times? _____

Are you currently menstruating? Yes No

If you are not currently menstruating, are you currently experiencing pre-menstrual tension? Yes No

If you have not cried today, stop here. If you have cried today, please answer the following questions.

What time was your most intense cry?

_____:

Where were you?

Who, if anyone, was with you when you cried (e.g. mother, father, brother, friend, teacher, stranger, etc.)?

Roughly how long did you cry for?

Hours: _____ Minutes: _____ Seconds: _____

How intense was your crying today?

Moist Eyes Soft Sobbing

Loud Crying Whole Body Sobbing

How did you feel after you cried?

Worse Similar Better

Did you feel that your crying in some way changed the situation you were in?

Yes, made it worse

No Effect

Yes, made it better

My Participant Code is: _____

Guilt	1	2	3	4	5	6	7
Pride	1	2	3	4	5	6	7
Powerlessness	1	2	3	4	5	6	7
Sorry for myself	1	2	3	4	5	6	7
Loneliness	1	2	3	4	5	6	7
Inspiration	1	2	3	4	5	6	7
Stress	1	2	3	4	5	6	7
Feeling unable to control your feeling(s)	1	2	3	4	5	6	7
Other (please specify):	1	2	3	4	5	6	7
Other (please specify):	1	2	3	4	5	6	7
Other (please specify):	1	2	3	4	5	6	7
Other (please specify):	1	2	3	4	5	6	7
Other (please specify):	1	2	3	4	5	6	7
Other (please specify):	1	2	3	4	5	6	7
Other (please specify):	1	2	3	4	5	6	7

Appendix S: Additional tables from Chapter 4

Table S.1

Basic descriptive statistics for emotions reported by female participants entered into multiple regression in Chapter 4.

	Mean	Std. Deviation
Relaxed	4.95	1.51
Calm	4.90	1.54
Sad	2.32	1.60
Joyful	4.63	1.74
Tense	2.45	1.65
Fearful	2.04	1.53
Restless	2.56	1.71
Irritated	2.36	1.66
Bad Tempered	2.05	3.15
Nervous	2.40	1.79
Crying Proneness	1.95	3.29

Table S.2

Basic descriptive statistics for emotions reported by male participants entered into multiple regression in Chapter 4.

	Mean	Std. Deviation
Relaxed	5.35	1.30
Calm	5.01	1.47
Sad	2.24	1.55
Joyful	5.01	1.48
Tense	2.43	1.56
Fearful	2.12	1.56
Restless	2.65	1.68
Irritated	2.70	1.80
Bad Tempered	2.19	1.58
Nervous	2.20	1.64
Crying Proneness	1.40	1.01

Appendix T: Additional table from Chapter 5

Table T.1

Correlation matrix for emotions averaged over 3 days during the recording period. High correlation between relaxed, calm, fearful, and irritated led to these being excluded when calculating regression analyses. Remaining variables were then entered into a multiple linear regression in Chapter 5.

	Calm	Sad	Joyful	Tense	Fearful	Restless	Irritated	Bad Tempered	Nervous	Crying Proneness
Relaxed	.90	-.29	.57	-.44	-.33	-.29	-.32	-.20	-.34	-.18
Calm		-.31	.57	-.44	-.36	-.30	-.36	-.22	-.32	-.12
Sad			-.42	.69	.72	.58	.66	.42	.65	.32
Joyful				-.42	-.33	-.38	-.35	-.26	-.27	-.15
Tense					.80	.68	.73	.42	.78	.21
Fearful						.63	.74	.44	.82	.22
Restless							.73	.44	.59	.15
Irritated								.53	.65	.21
Bad Tempered									.36	.15
Nervous										.25

Note: All above correlations were significant ($p < .05$).

Appendix U: Additional tables from Chapter 6

Table U.1

Basic descriptive statistics for reported reasons participants cried prior to being entered into Principal Axis factor analysis in Chapter 6.

Reason for Crying	Mean	Std. Deviation
Anger	2.70	1.96
Conflict	2.63	2.25
Failure	2.55	2.13
Fear	2.03	1.63
Guilt	1.69	1.40
Happiness	1.54	1.40
Helpless	2.88	2.25
Hopelessness	2.63	2.09
Inspiration	1.25	.93
Loneliness	2.40	2.20
Loss	2.05	1.93
Negative Thoughts about Others	2.10	1.88
Negative Thoughts about Self	2.62	2.24
Physicalorpain	1.99	1.97
Pity	1.79	1.51
Positive Experiences	1.38	1.22
Powerless	2.44	1.96
Pride	1.37	1.07
Rejection	2.23	2.02
Relief	1.25	.76
Sadness	4.24	2.23
Selfpity	2.19	1.81
Stress	2.40	2.05
Witnessing Suffering	2.14	2.04

Table U.2

Number of times each variable loaded on to the 4 factors across the 10 alternate solutions generated using random resampling with replacement. Items bolded indicate they were loadings on the original factor structure based on the complete dataset. Items not bolded indicate variables that were not in the original solution but did load on factors in some of the alternate solutions.

Reason for Crying	Types of Crying			
	Depressive	Confrontational	Joyful	Empathic
Loneliness	10			
Negative Thoughts about Self	10			
Hopelessness	10			
Rejection	10			
Personal Failure	10	1		
Powerlessness	10			
Self-pity	10			
Helplessness	10			
Stress	9	1		
Fear	7	1		
Negative Thoughts about Others	6	5		
Conflict		10		
Anger		10		
Guilt	2	7		
Happiness			10	
Positive Experiences			10	
Relief		1	9	
Pride			10	
Inspiration			7	1
Witnessing Suffering				10
Sadness	8			10
Pity				10
Loss				4
Physical Pain				1