Crying: Call for a Lifespan Approach

Jonathan Rottenberg1* and Ad J. J. M. Vingerhoets2
1 University of South Florida
2 Tilburg University

Abstract
Although crying is woven through the life course, from the doctor’s slap to a deathbed vigil, there is no well-established lifespan tradition of studying crying. Instead the study of crying is broken into separate bodies of work on childhood (mostly on infants) and on adults. In this contribution, we share our enthusiasm and our ideas for the construction of a lifespan narrative of crying behavior. The evolutionary and phylogenic basis of crying is first outlined. We highlight the most important transitions in humans, including changes in the antecedents of crying, and the ways crying is increasingly regulated. We piece together existing research on these transitions and identify key gaps in knowledge, including the developmental periods, such as adolescence and old age, that have been the most seriously neglected. Finally, we suggest key empirical and methodological future directions that will most invigorate the study of crying as a developmental phenomenon.

Introduction
Few behaviors touch so many different areas of psychology as crying. Its importance in signaling distress and difficulties makes it relevant to clinical psychology. Its anchoring in a specific physiological response, lacrimation, puts it in the domain of biological psychology and neuroscience. Despite its strong biological foundation, human crying is also a profoundly cultural activity. From political campaigns to schoolyard bullies, few behaviors are as pregnant with meaning as crying, which puts it in the domain of social and cultural psychology. Finally, there are massive individual differences in who cries in what circumstances, which puts crying in the domain of personality psychology.

Crying should also be of keen interest to developmental psychologists. It punctuates the life course from the doctor’s first slap to our final moments. The antecedents of crying are diverse – from being separated from one’s mother, meeting strangers, skinning one’s knee on the playground, to weddings, bar-mitzvahs, reunions, petty squabbles, sentimental movies, and funerals – but often it signifies something important has happened. Given the ways that crying is woven through the life course, it is hard to imagine a behavior more suited for a developmental analysis. Indeed in this article, we will describe both dramatic developmental changes in crying, as well as notable consistencies.

Despite the promise of this area of study (see Zeifman, 2001a; Nelson, 2005 for models), the developmental tradition in the study of crying has not been fully realized. One factor that has hindered progress is that current research on crying is divided into two nearly totally disconnected subfields. One that concerns crying in babies, which may also consider toddlers, and another that considers crying in adulthood, which is generally understood as but a single developmental phase. The two subfields have grown up in isolation from one another. Consequently, we lack the means to confidently assess whether child
and adult crying differ in fundamental ways, and we lack a coherent overall “story” about what happens to crying behavior over developmental time.

In this article, we call for a developmental approach to crying. We stress the need for developmentally informed theories to build a coherent overall story of this behavior. And we need empirical data to be collected, not only to evaluate these theories, but also to establish basic norms concerning the frequency of crying, as well as its antecedents, correlates, and consequences. Although these needs apply to the whole life course, there are several developmental points, such as middle childhood, adolescence, and old age, where the lack of normative data is particularly glaring.

The goals of this contribution, then, are largely heuristic. Our overall agenda is to share our enthusiasm and our ideas for the construction of a lifespan narrative of crying behavior. To achieve this, the following sections first outline the evolutionary and phylogenetic basis of crying. As we move to human crying, we consider some of the most important developmental transitions in our species, including changes in the antecedents of crying, and the ways crying is increasingly regulated. We piece together existing research on these transitions and identify key gaps in knowledge. Finally, we suggest key empirical and methodological future directions that will most invigorate the study of crying as a developmental phenomenon.

Evolutionary and Phylogenetic Development of Crying and Tears

First, we briefly review the evolutionary and phylogenetic development of crying and tears, as these provide an orienting backdrop for developmental transitions in human crying. In ophthalmology, three kinds of tears are recognized: (1) basal tears; (2) reflex tears; and (3) emotional tears (Murube, 2009a,b). A word on each is warranted.

All terrestrial animals, amphibians, reptiles, birds, and mammals produce basal tears to keep the surface of their eyes moist. Basal tears have unique glands within the lacrimal apparatus, the formation of which was among the changes that took place during the evolution of fishes into amphibians, which were the first vertebrates living outside water. The function of basal tears is to protect the eye and facilitate vision.

The term reflex tears refers to several different kinds of tears, including irritant tears (produced by damage, infections, foreign bodies, or gasses), but also to tears that are generated in response to blinking, yawning, laughing, or vomiting. The major function of reflex tears is to wash away irritants (e.g., onion fumes, cinders).

Finally, emotional tears are, from an ophthalmological perspective, considered a special kind of reflex tears. Like reflex tears, these tears are also produced in the almond shaped lacrimal glands located in the upper, outer portion of each orbit, in the lacrimal fossa of the orbit formed by the frontal bone.

Phylogenetically, the development has been from basal to reflex (irritant) to emotional tears (Murube, 2009a). Basal tears first developed in amphibians and were maintained in reptiles, birds, and mammals. Reflex tears, in contrast, are not present in the great majority of amphibians and reptiles, but exist in most, if not all other species.

When crying is defined in humans, it is typical to refer not only to lacrimation (or tears) but several loosely coordinated behaviors, involving changes in respiration (gasping), and vocalization (wailing) (see Vingerhoets, Bylsma, & Rottenberg, 2009). Emotional tears are only shed by humans (Frey, 1985; Murube, 2009c). Whether one sees crying itself as unique to humans depends on whether crying is equated with the secretion of emotional tears. If this is the definition, crying is indeed uniquely human. But if the definition is broadened to include emitting sounds to attract the attention of the mother, a
broad range of species cry, with distress vocalizations present in birds and many mammals (see Newman, 2007; Panksepp, 1998). Interestingly, human ontogenetic development recapitulates the phylogenic order in which tears are seen. Whereas basal tears are already present in fetuses months before birth, reflex tears first occur a few days until a few weeks after birth; the last tears, emotional tears are not seen until 3 or 4 months after birth.

Key Developmental Transitions in Human Crying: Morphology, Frequency, Functions, and Antecedents

Developmental changes in the morphology of crying

The delayed emergence of emotional tears in humans is one illustration of how profoundly crying is influenced by development. Darwin (1872) keenly observed changes in the morphology of the crying response over developmental time. He noted that while young infants are physically capable of secreting tears, they did not actually secrete tears when they made crying vocalizations.

Infants whilst young do not shed tears or weep, as is well known to nurses and medical men. This circumstance is not exclusively due to the lachrymal glands being as yet incapable of secreting tears. I first noticed this fact from having accidentally brushed with the cuff of my coat the open eye of one of my infants, when seventy-seven days old, causing this eye to water freely; and though the child screamed violently, the other eye remained dry, or was only slightly suffused with tears. (Darwin, 1872, p. 152)

By 3 or 4 months of age, the typical infant crying response of tearless wailing changes to wailing with tear secretion. This is a dramatic shift in the morphology of crying, but we know little about why it happens, or what it signifies.

The emergence of emotional tears in infants underscores a longer shift that continues over developmental time: Tears become an ever more salient sign and component of crying. In fact, adults oftentimes do the exact opposite of newborns – and secrete silent tears. This massive shift from tearless wailing to silent tears parallels a change in crying from a predominantly auditory to a mainly visual signal (tears). At this point, we can only speculate on why this may be. Perhaps this change is explained in part by increased locomotion in the crier–the ability of older children to move right to the target audience and capture attention visually rather than utilizing an acoustical signal (Zeifman, 2001). An exclusively visual signal could also have evolutionary advantages, avoiding hazards associated with broadcasting vocalizations, such as attracting unwanted attention from predators or hostile human conspecifics. Moreover, judgment studies of faces digitally enhanced with tears show that this increasingly visual signal “works” as a crier grows older. When tears are present on a sad adult face, this intensifies judgments of facial sadness to a greater extent than when tears are present on an infant or child sad face. Likewise, when tears are present on sad adult face the face is judged as more sympathetic than when tears are present on an infant or child sad face (Zeifman & Brown, 2011).

Developmental changes in the frequency of crying

In some respects, infancy is the best understood period from the perspective of normative data about crying frequency. We have fairly dense observations of crying during the first year of life. The amount of infant crying is dynamically changing. The general conclusion from the literature is that crying gradually increases from birth until it peaks at 6 weeks,
then decreases until 4 months, and then stabilizes for the rest of the first year (i.e., Bell & Ainsworth, 1972; Brazelton, 1962; Hunziker & Barr, 1986; Rebelsky & Black, 1972). One major developmental change in crying that we discuss in more detail below is the great drop off in crying frequency after age 2 (usually after the peak of stranger anxiety and acquisition of motor and language skills; Zeifman, 2001).

Another profound change in crying frequency that we discuss in greater detail below is the emergence of sex differences in crying frequency. Several studies have found that female and male infants do not differ markedly in how often they cry (e.g., Maccoby & Jacklin, 1974). However, we know that in adulthood, in every culture that has been studied, females cry more often than males. A major international study of crying found this difference in 37 different countries (Van Hemert, Van de Vijver, & Vingerhoets, 2011). However, as we discuss below, the developmental timing of this dramatic transition has been only sparsely documented, which complicates efforts to interpret its meaning (i.e., does it emerge from biology, culture, etc.).

**Developmental changes in the basic functions of crying**

Compared to infants of other species, human infants stand out for their high degree and long duration of helplessness. Baby crying has therefore been referred to as the “acoustical umbilical cord” (Ostwald, 1972), serving to establish and maintain a close connection between the infant and the caregiver. Babies cry from hunger, pain, or to bring the caregiver nearer. The common denominator of these crying motives is to communicate needs to the parents or caregivers. Infants generally will stop crying when picked up or held by their caregiver (for an intelligent discussion of exceptions, see Zeifman, 2001). While infant crying is not static – for example, infants show decreases in colic crying and increases in crying in the presence of strangers (Bayley, 1931) – it is fair to say that infant crying is generally a matter of survival (Barr, Hopkins, & Green, 2000; Soltis, 2005). For a completely dependent infant, losing contact with the caregiver or not getting basic needs met can be fatal.

Because infant crying serves to assure and call for the protective and nurturing presence of caregivers, many regard it as an innate attachment behavior (Bowlby, 1969/1982; Nelson, 2005). In fact, one advantage of a lifespan developmental approach to crying is that it is possible to recognize important continuities in this attachment function for crying from infancy to death that will be shaped by one’s characteristic attachment style (e.g., secure, ambivalent; Laan, Van Assen, & Vingerhoets, 2012). Figure 1 depicts this theme, how crying continues as a significant attachment behavior as a person’s social field expands from the self-centered crying of infancy to include attachments to romantic others, and ultimately connections to others in a larger cultural or national group (Dissanayake, 2008; Vingerhoets, forthcoming). The hormone oxytocin, strongly implicated in the formation of social attachments (i.e., Insel, 1997), may be important in mediating this attachment-related crying over the lifespan (e.g., Strathearn, Fonagy, Amico, & Montague, 2009).

There are few systematic studies of crying in school-aged children, so we are less certain about the functions of crying at this age (see Hstrup, Kraemer, Bornstein, & Trezza, 2001). What seems clear from common knowledge is that there is both continuity with infancy and new functions. As with infants, crying remains an attachment behavior to solicit caregivers. Children still cry out of hunger, like infants, but the normative acquisition of language skills allows children to communicate their hunger in words. Children continue to cry directly out of pain, but now are able to cry also at the anticipation of pain (before receiving an injection).
On top of these old functions, new functions are superimposed. Crying emerges as a key means of managing peer conflicts, such as reactions to rejection or bullying (e.g., Glew, Rivara, & Feudtner, 2000). Interestingly, it has been found that crying after a fall is more likely when falling was caused by another child (Brackett, 1934). As discussed below, increases in self-regulatory capacity allow crying to be deployed more selectively and strategically. Crying can be used as a negotiation tactic to reinforce begging and supplication and to reduce anticipated anger of parents. In general, children become more aware of the reactions that others have to their crying and are better able to anticipate those reactions. The classic example is the child that hurts him or herself but does not start crying before seeing his or her mother. Likewise a 10-year-old boy fighting back tears when having been insulted or bullied in the schoolyard demonstrates the acquired ability to control his tears and choose when they occur. Indeed, increasingly children cry when in the company of their parents, rather than when in the company of peers or strangers (Zeman & Shipman, 1996).

In the transition to adulthood, the functions of crying become more diffuse, diverse and less tied to immediate survival needs. Perhaps it’s not surprising that scholars have disagreed about the functions of crying in adulthood – from psychoanalytic theories that focus on crying as means to discharge tension to physiological theories that focus on crying releasing biochemical toxins to interpersonally based theories (for review see Vingerhoets, forthcoming). One reason the picture is confusing is that the antecedents of crying multiply as people get older (e.g., seeing moral injustice, crying during positive emotion, see below). Nevertheless, attachment functions seem to endure even across diverse antecedents, as reflected in the ways that crying behavior continues to elicit caregiving and/or to reduce aggression in others (Hendriks & Vingerhoets, 2006). As a species, humans are unique in their level of mutual non-kin collaboration and taking care of the elderly and weak. As such, crying both reflects and contributes to our species being ultra-social (Vingerhoets, forthcoming; Walter, 2006).

Figure 1  Model of the continuity of crying and attachment concerns over the lifespan.
Developmental branching of antecedents

Another major developmental theme from childhood through adulthood is the remarkable branching of crying antecedents over time. At this point, we simply highlight several examples of branching as phenomena that require explanation. It is highly unlikely that a single explanation is viable. We expect that new antecedents of crying arise from the interaction of multiple factors, including changing goals of the child, the child’s personality and attachment style, exposure to new environments or stimuli, social learning about when crying can be expected, along with the unfolding of cognitive, moral, and emotional development across time (Vingerhoets, forthcoming).

The appearance of planned, deliberate action towards the end of infancy, and the opportunity it presents for goals to be thwarted, may explain why frustration rises as a major antecedent and trigger of crying among toddlers (Shepherd, Oppenheim, & Milchell, 1971). This exemplifies how new goals can alter the antecedents of crying. Crying may increasingly manifest during outright temper tantrums and other situations in which frustration is experienced (e.g., not wanting to comply with parental wishes, wanting immediate gratification, etc.).

New crying antecedents also piggyback on to normative emotional development. “New” social emotions such as shame and guilt are typically acquired by 3-year-old children, and reflect both the unfurling of internal processes and social learning (Lewis & Wolan Sullivan, 2005). This has clear implications for crying. For example, the awareness that one has done something wrong, and behaved in a socially unacceptable way, may enable children to cry after telling a lie. Confessions may be accompanied by tears – both to demonstrate conscience and to mitigate penalties.

Young children cry when basic needs are not being met (e.g., pain, lack of warmth). By contrast, school-age children can cry in objectively benign situations, even when basic needs are not threatened. For example, many 8-year-old children cry when watching Bambi, when his mother has been killed (Sternbach, 1962). Crying at Bambi is a simple act, but it reflects a major accomplishment of cognitive development: The child can sympathize with Bambi, actually a symbolic stimulus, when he is sad because of the loss of his mother. Such an act requires general awareness of other beings as having their own cognitions and emotions (“theory of mind”), and a specific ability to imagine what another is feeling in any given situation. In these ways, cognitive development of empathic skills potentially expands the playing field of crying (Killen & De Waal, 2000) to a range of symbolic stimuli like images, books, or movies.

While the number of crying antecedents generally increases, some antecedents become less important over time. A recent study contrasted self-reported causes for crying of 12- to 16-year-old adults. For example, whereas adolescents still commonly report crying as a response to physical pain and injuries, these antecedents are rarely reported by adults (Beck, 2010; Vingerhoets et al., 2009).

We think the branching of antecedents continues even through the course of adulthood. The best examples are crying for positive reasons (e.g., a child’s college graduation), and crying for moral reasons (e.g., elevation, awe, admiration), which appear to be rare antecedents for adolescents and young adults. Descriptive data suggest that about one in ten adult crying episodes are reported as coming in response to positive events (Vingerhoets et al., 2009; but see Feldman, 1956). Unfortunately, there is little documentation on exactly when in the lifespan crying for positive reasons arises or what explains its emergence. Similarly, we know little about what might be responsible for sentimental or moral crying, which is seen particularly with the witnessing of acts like altruism, self-sacrifice, bravery, or triumphing over injustice. Clearly, these intriguing changes in crying are ripe for further study (Tan & Frijda, 1999; Vingerhoets, forthcoming).
Developmental changes in the regulation of crying

People are not passive vehicles of emotion; they make efforts to influence the experience and expression of their emotions, a concept called emotion regulation (Gross, 2007; Nyklicek, Vingerhoets, & Zeelenberg, 2011). Children gradually learn to assume more control over their emotions, to modify the intensity, duration, and quality of emotion. Emotional reactions, especially when they are negative, may be postponed to a more appropriate setting or be altered to become less visible to outsiders. Developmental approaches to crying must then be mindful of the changes in self-regulatory capacity and the awareness that crying is not always appreciated by the social environment and might have negative effects for one’s image and reputation that alter when and how crying manifests.

While we know that crying becomes increasingly regulated, there is uncertainty about the precise manner in which this comes about, or how regulation of crying behavior is similar to or distinct from other increases in self-regulatory capacity (e.g., the ability to delay gratification, Mischel, Shoda, & Rodriguez, 1989). A reasonable first hypothesis is that the capacity to control crying grows in concert with other forms of impulse regulation (e.g., to control temper tantrums) and will connect to the same brain changes that support self-regulation generally (i.e., maturation of prefrontal cortex areas, that inhibit limbic brain areas thought to be involved in generating crying episodes; Beauregard, Lévesque, & Bourgouin, 2001).

Indeed, increased emotion regulation might be responsible for a remarkable discrepancy between infant and adult crying: The very behavior that infants use to draw others near, adults often hide from others. The motivations to inhibit crying are clear enough: children who easily come to tears (and especially boys) might be preferentially targeted for taunting and bullying by their peers (Von Salisch, 2001). It is not surprising, then, that children learn to direct crying in a more strategic fashion, toward individuals who are highly motivated to provide care for them, and inhibit crying in the presence of those who may be disinclined to tolerate it (Zeman & Shipman, 1996). The trend evident across development is increased selectivity in choosing target audiences. In fact, in adulthood a combination of continued social pressures and increased self-regulatory ability make it normative for crying to be inhibited in public settings, with few exceptions (funerals, rituals). Most often, crying will take place in the privacy of one’s own home, with no stranger present (e.g., Vingerhoets et al., 2009). Given that adults are strategic in how they deploy this behavior, it is ironic that the onsets of crying episodes are often described as completely uncontrollable. Thus, adults are likely unaware of the extent to which they can control their crying.

Specific Priorities for Further Exploration

The great drop off in crying after age 2

One major developmental change in crying is the great drop off in crying frequency after age 2 (usually after the peak of stranger anxiety; Zeifman, 2001). Again, since the study of crying in toddlers is poorly developed, we can offer only educated guesses as to why this may be. One hypothesis is that the toddler’s newly acquired motor control limits falls and other potential injuries that previously triggered crying. Another hypothesis is that language skills can substitute to communicate needs to a greater extent, leaving crying unnecessary in many situations. Consistent with this idea, crying frequency has been found to be inversely related to language skills (Kopp, 1992).
In this connection, we would submit that whining could serve as a transitional form of crying, as the child becomes more physically independent and linguistically competent. Whining is a vocalization, often coupled with speech, which is used to make a request (e.g., for food), lodge a complaint, or represent discontent (Sokol, Webster, Thompson, & Stevens, 2005). It has been suggested that whining shares with crying the specialized acoustic characteristics of increased pitch and varied pitch patterns. Whining can convey a more specific message to the listener than does crying but can develop into crying, and we would hypothesize that it is often received similarly by caregivers. Research designs that measure whining and crying over time would be useful to address the hypothesis that whining is a transitional form.

Developmental origins of sex differences in crying

As we previously alluded, one of the key gaps in data concerns the precise timing and correlates of the sex difference in crying. It is a tidal shift: Boy babies and girl babies cry at a similar frequency, and, if anything, boy infants cry more (see below); yet by adulthood, males cry much less often than adult females in every culture that has been studied (Van Hemert et al., 2011). Establishing when this difference emerges is a first step, which may help to constrain interpretation of what might be responsible.

If we believe surveys of parents and clinicians, sex differences in crying might start as early as 8 years old (Trezza, Hastrup, & Kim, 1988). However, the earliest that an empirical study has found the sex difference is about 11 years old (Van Tilburg, Unterberg, & Vingerhoets, 2002) with other work also showing differences developing within a year of two of 11 (Shepherd et al., 1971). Even with improved dating of this sex difference, it is still not yet entirely clear whether the split is explained more by increases in crying among girls, decreases in crying among boys, or some combination of the two.

At this stage, even based on these limited data, some hypotheses can be ruled out. Contrary to Frey’s (1985) hypothesis that these differences are linked to menarche (onset of menstruation) and levels of the hormone prolactin, same age menstruating and non-menstruating girls do not differ in crying frequency (Van Tilburg et al., 2002). In general, most hypotheses about the emergence of sex differences in crying remain in play, including differences in parental socialization for boys and girls, differences in how the peer environment responds to boys’ and girls’ crying; differences in exposure to emotional situations (e.g., females prefer to watch tear jerkers); differences in the appraisal of emotional situations (females might be more likely to appraise selves as helpless); biologically based differences in temperament, which influence crying threshold over time (due to genetic or hormone influences); and even differential capacity for self-control of tears (cf. Bekker & Vingerhoets, 2001).

Finally, even where we have reasonably sound data on sex differences, as in infancy, there remain challenges in interpreting them. As mentioned above, there are at least some indications that infant males cry a bit more than infant females (Vingerhoets & Scheirs, 2000). This difference would seem to imply that male infants have a lower threshold for crying than female infants. But we think an alternative possibility is more likely: Male infants may put themselves at greater risk for crying than girl infants. If boys demonstrate stronger tendencies than girls towards exploratory drive and rough play, boys would be at a great risk of experiencing pain as well as frustration, key antecedents of crying. Interestingly, consistent with our speculation (and inconsistent with the idea that boys cry more readily), when boy and girl babies were exposed to the same stimulus – a standardized arm restraint procedure – the procedure actually elicited crying in infant girls more quickly than in boy infants (Camras,
Oster, Campos, & Bakemand, 2003). These findings highlight that a relatively simple outcome like the frequency of crying is not so simple, and reflects a joint function of innate reactivity, frequency of stimulus exposure, as well as self-regulatory capacity.

**Why does human crying persist into adulthood?**

Finally, we close with an important puzzle for which an easy answer is unlikely. Why does human crying even continue into adulthood? In other animal species, there is variety in how distress calls develop with increasing age. In some species (e.g., some bird species), distress calls are displayed nearly exclusively by helpless youngsters, with adults having no or only limited crying in their behavioral repertoire. In others (rats, dogs) adult animals also produce these sounds, in certain situations (Newman, 2007). Although the morphology of human crying moves from an auditory to a visually based signal, humans are a species in which the adults strongly retain the juvenile behavior. One explanation for why adult humans cry would talk about the proximal functions that crying continues to serve through the human life course. As suggested above, crying appears to have enduring utility for adult humans, such as expressing of positive and negative feelings, inhibiting aggression in others, the facilitation of social bonding, and eliciting sympathy and empathy, resulting in cooperative and helpful behavior (Hasson, 2009; Vingerhoets, forthcoming). This peaks in so-called sentimental tears that convey a sense of solidarity among mankind, aroused by situations that concern major moral and societal issues like morality, justice, or altruism (Vingerhoets, forthcoming).

Another kind of answer addresses a more ultimate reason for why crying persists in our species. Adults in our species retain a number of infant anatomical and behavioral characteristics during the course of development (flattened face, hairless body), even well beyond reproductive age. This trend is called neoteny, which some commentators consider to be a great theme of human evolution (e.g., Gould, 1980). The major advantage of neotenic brains is that they remain highly plastic and susceptible to modification by the environment for many years after birth, probably until 15–25 years of age in humans. From this perspective, human crying in adulthood may be just another neotenic behavioral characteristic, rather than a phenomenon that requires any special explanation.

**Concluding Comments**

Crying is one of the most dramatic and durable of all the emotional behaviors. Despite this, the study of crying has been slow to take hold among scholars. In part, this has reflected a lack of sustained interest in the topic, and in part this has reflected the challenges of studying a relatively infrequent event that is difficult to elicit ethically (Rottenberg, Bylsma, & Vingerhoets, 2008). Given that research on this topic remains at an early phase, it is important to outline what will be gained by persevering. With this in mind, our main hope was heuristic, to show the intellectual opportunities of taking a lifespan approach to crying. We believe sizeable mutual benefits and major new insights will accrue to the study of crying and the study of development with even modest investments of time, energy, and money.

**Short Biographies**

Jonathan Rottenberg received his PhD in Psychology at Stanford University. He is currently an Associate Professor of Psychology at the University of South Florida. His
research aims to bridge affective and clinical science, using a multi-method approach to assess emotion. He uses both cross-sectional and longitudinal designs to better understand how depression alters emotional functioning, a topic from which his interest in the study of crying emerged.

Ad J. J. M. Vingerhoets received his PhD in the Social and Behavioral Sciences at Tilburg University, Tilburg, The Netherlands in 1985. He is currently a Professor of Clinical Health Psychology at Tilburg University. His expertise is in the areas of stress, emotions, and quality of life. His special interest is devoted to specific themes like crying and stress and leisure, as well as the development of new assessment tools to measure quality of life. He published more than 300 articles in (inter)national scientific journals and wrote/edited 17 books.

Endnote
* Correspondence address: Department of Psychology, University of South Florida, PCD 4118G, 4202 E. Fowler Avenue, Tampa, FL 33620-7200, USA. Email: rottenberg@usf.edu

References


