

Crying

Daniel M. T. Fessler^{1,2} & Cristina M. Moya^{1,2}

1. UCLA Center for Behavior, Evolution, & Culture
2. Department of Anthropology, University of California, Los Angeles

We define crying as a multimodal behavior consisting of tears, nonverbal vocalizations (wails, sobs), and facial expressions of distress. Being most frequent in infants, and arguably less subject to cultural display rules, we take infant crying as the prototypical form. Correspondingly, we take distress (sadness, fear, anger, or pain) as the core condition expressed through crying since, although adults sometimes cry in other circumstances (notably when happy), infants appear not to do so. Lastly, although tears are a uniquely human component of crying, distress vocalizations and corresponding displays occur in many mammals, again primarily present in infancy.

Compared to most affective displays, crying is intrinsically costly, particularly for human infants. Full-fledged crying involves contraction of large muscle groups, and hence is energetically more expensive than many displays. Moreover, cries of helpless human infants are easily detected by animals, increasing the risk of predation in ancestral populations. Finally, whether by design of the cries themselves, design of listeners' auditory systems, or both, crying is irritating and distracting to adults (particularly non-kin), increasing the risk of infanticide. These costs must be considered in any functional analysis of crying.

Infant crying is traditionally considered an index of the need for succour (Zeifman 2001). The interests of parents who spread their resources over multiple offspring sometimes conflict with those of the infant, who would monopolize investment. Although infants might therefore profit by exaggerating signals of need, the intrinsic costs of crying may constrain such dishonesty, as natural selection would disfavor exaggeration beyond the point where added costs exceed additional benefits. Perhaps combining contextual information with assessments of cry intensity, caregivers often distinguish among 'types' of cries (hunger, pain, etc.) (Gustafson 2000), suggesting that infants do not extensively exaggerate signals of need.

If crying honestly signals need, why do infants sometimes cry in the apparent absence of elicitors? Caregivers ought to be able to deduce the cause, yet infants can be inconsolable. Given the energetic costs of crying, this suggests that cries from so-called colicky infants serve as signals not of need, but of vigor -- advertising vigor could benefit the infant whenever parents must decide how much to invest in a given infant (Soltis 2004). However, this argument remains controversial, as colicky crying often induces frustration or depression in parents rather than increased attachment and investment (Beck 1996); others have questioned whether colic is specific to patterns of child care in industrialized societies where, unlike many hunter-gatherer societies, infants are often not in contact with caregivers (Fouts *et. al.* 2004).

The propensity to cry in response to distress is preserved into adulthood. However, the honesty of the signal is degraded. Being less vulnerable to predation and aggression,

crying adults pay lower costs than infants. Moreover, adults seem more capable of manipulating this signal— adults can suppress crying even in the face of stimuli, such as pain inducers, that invariably evoke crying in infants; conversely, some adults can spuriously cry in the absence of distress. Presumably, crying is maintained into adulthood because it continues to elicit supportive responses from others, yet the degradation of the honesty of the signal makes this puzzling -- given that Machiavellian individuals cry strategically, why have recipients not stopped responding to adult crying, leading to the disappearance of this pattern? One possibility is that the signal remains somewhat costly both because of its irritating nature and because crying is modestly incapacitating, leaving the crier more vulnerable to attack; this may explain why adults cry more freely in the presence of kin or friends (Zeifman 2001). Moreover, while kin and friends remain susceptible to manipulation, they have the advantage of fuller access to information regarding the frequency with which crying occurs and the eliciting circumstances, facilitating detection of dissimulation. This suggests that solitary adult crying reflects the assessment that bonds with potential observers are sufficiently weak as to make it more likely that they would respond with hostility than aid. Likewise, the value of strategic deployment may account for a developmental shift in emphasis from the acoustic to the visual components of crying – whereas helpless infants are best served by broadcasting a vocalization detectable at a distance, adults profit more from tears, visible only to those in close proximity (Zeifman 2001).

In addition to the question of honesty, adult crying differs from infant crying in that adults occupy a symbolic world opaque to infants. This includes not only elicitors of

distress, but also the meaning of crying itself. Perhaps because of its ease of detection, its association with infancy, or both, crying is highly subject to cultural display rules. Such rules influence the subjective consequences of crying, as non-normative crying can induce shame, while normative crying can be cathartic (Becht and Vingerhoets 2002). Finally, the expressive facets of crying are often institutionalized in ritual displays of crying and crying-like vocalizations.

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