



# Is “crying it out” appropriate for infants?

## A review of the literature on the use of extinction in the first year

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### 1 Extinction (crying it out) is the most studied intervention for infant sleep problems.

**Advice in Popular Parenting Media:**  
“How long do I let my baby cry?”  
To establish regular naps, no more than one hour. . . There is no time limit at night if the child is not hungry or ill. If we place an arbitrary limit on the duration of crying at night, we train our child to cry to that predetermined time. When it is open-ended, the child learns to stop protesting and to fall asleep.”  
**Healthy Sleep Habits, Happy Child**  
Weissbluth, 1999, p. 159.

#### Background

Concerns about the quality and quantity of an infant’s sleep top the list of worries for parents. While some literature indicates that infant sleep involves a complex interaction of biological, developmental, and environmental factors<sup>1</sup>, the majority of research suggests that infant sleep problems result from caretaker responsiveness which inadvertently reinforces nightwaking behavior<sup>2</sup>.

As a result, the most empirically investigated approaches to infant sleep problems involve modifying parental responses to nighttime crying. Based on behavioral theories, extinction of unwanted behavior involves withdrawing reinforcement (parental attention) for the operant behavior (waking and crying)<sup>3</sup>.

#### Popularly called crying it out (CIO), variations of the intervention include:

**Unmodified or pure extinction** (see also *systematic or planned ignoring, cold turkey*) involves putting the child to bed, closing the door and, unless the child is ill, not reentering until morning<sup>4</sup>.

**Graduated extinction** (see also *progressive delay responding, controlled crying, Ferberizing*), allows the parent to check in—but not pick up—the child at progressive intervals, thereby reassuring parents about the child’s well-being<sup>5</sup> and allowing them to practice ignoring cries<sup>6</sup>.

Research to date submits that CIO is quick<sup>7</sup>, effective<sup>8</sup>, and without negative side-effects<sup>9</sup>.

However, a majority of existing research was conducted on children older than 1 year who presented with identifiable sleep disorders.

Popular parenting advice in the U.S. nevertheless endorses the use of CIO as a preventative approach for infants beginning as early as 3 months.

**Does existing research support the use of CIO for infants under 1 year?**

### 2 CIO is increasingly endorsed by popular parenting books and magazines for infants 3-6 months of age.

#### CIO is recommended by a majority of pediatricians<sup>10</sup> and parent advice books on infant sleep<sup>11</sup>.

While the majority of existing research focuses on ameliorating diagnosed nightwaking problems in infants older than 1 year<sup>12</sup>, CIO is increasingly endorsed in popular parenting literature as a preventative approach for infants starting between 3 and 5 months<sup>13</sup>.

Some authors have suggested beginning as early as 6-8 weeks<sup>14</sup>. (See handout for overview of popular methods.)

**Advice in Popular Parenting Media:**  
“Nor should you worry about letting a very young baby cry. In fact, the younger the infant, the easier the process will be. ‘Babies older than 5 or 6 months are naturally going to be more upset because you’ve changed the rules on them,’ Dr. Schaefer says. ‘A 3-month-old . . . knows only the routine that you create.’”

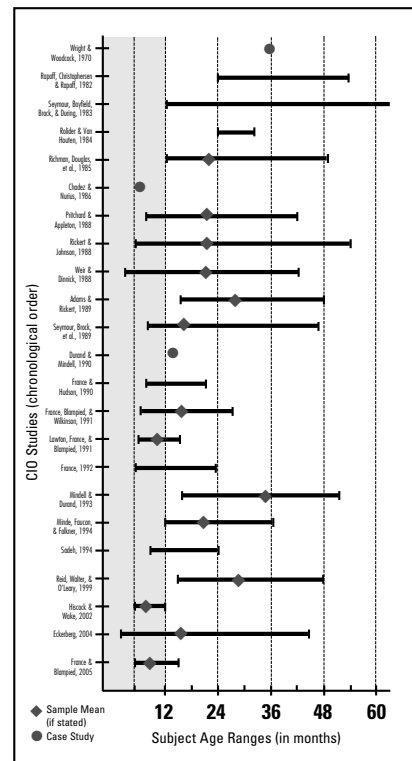
*Teach Your Baby to Sleep In Just 7 Days*  
Parents Magazine, May 2000

#### Advice in popular parenting magazines and books suggests:

- 1 Parental behavior is the primary cause of nightwaking.
- 2 Sleep training should begin early to prevent sleep problems from taking root.
- 3 Prolonged crying is neither physically nor psychologically harmful and will not damage the infant’s relationship with the parent.

### 3 Research on CIO with infants <1 year is inadequate.

Table 1: Age ranges for CIO study samples.



#### A large number of CIO investigations did not include infants.

22 studies were found that investigated the use of either pure or graduated extinction with children (Table 1). Of these, 13 included any infants under 1 year<sup>15</sup>. Only 2 studies (one research study, and one case study) focused on infants exclusively<sup>16</sup>.

Only 2 studies include any infants under 6 months<sup>17</sup>; however, neither study indicates how many infants of this age were included in the sample.

#### Of the studies that included infants, none calculated effects for this age group.

With one exception<sup>18</sup>, results were reported for the sample as a whole. No studies examined effects for infants (<1 year) versus older groups.

In fact, infant sleep literature rarely distinguishes between infants and older children. Literature referencing CIO’s positive effects frequently cites as evidence studies conducted on toddlers and older children<sup>19</sup>.

#### Developmentally-based exploration of outcomes is lacking.



- The majority of CIO outcome measures focus exclusively on the extinction of crying<sup>20</sup> and fail to explore the existence of side-effects beyond whether or not the child stayed asleep.
- Only 5 studies were found that investigated the existence of changes in post-CIO behavior. Out of these, 3 included infants in the sample<sup>21</sup>. Each of these studies employed the same parent-report scale. No objective assessments were conducted.

The Flint Infant Security Scale<sup>22</sup> was used in each study to assess post-CIO infant behavior. Though designed to measure infant security, it is not clear that the scale actually measures security per se, but rather describes behaviors more related to regulatory capacities, temperament, and developmental level (e.g. “Can accept sudden advances of a stranger.” “Enjoys a crowd.” “Can recover easily when upset.”) Further, results as measured by the Infant Security Scale have been misconstrued as evidence that CIO does not affect attachment<sup>23</sup>.

**To date, no studies of CIO have employed objective, observational assessments of changes in infant, caretaker, or dyadic behavior, or biobehavioral outcomes.**

### 4 Is prolonged crying biobehaviorally benign?

**Advice in Popular Parenting Media:**  
“Steel yourself. . . a little—or a lot of—crying may ensue. But rest assured, it will be tougher on you than on your baby. . . Get over the worry that ignoring your baby while he cries will do psychological harm,” emphasizes Dr. Schaefer.”

*Teach Your Baby to Sleep In Just 7 Days*  
Parents Magazine, May 2000

**Advice in Popular Parenting Media:**  
“Some parents fear that ignoring a baby’s wails at night may make her feel abandoned. . . . But most child-development specialists believe that letting an infant cry so she learns to fall asleep on her own is healthier in the long run. . . . Experts suggest holding off on sleep training until your baby is at least 3-months-old, when she’ll be better able to soothe herself.”

*Goodnight baby!*  
Parenting Magazine, April 2002

**Advice in Popular Parenting Media:**  
“Is crying harmful?” Not necessarily. In fact, recent studies have proven that crying produces accelerated forgetting of a learned response. So when a child cries, she may more quickly unlearn to expect to be picked up. When trying to stop an unhealthy habit, crying may have some benefit, because crying acts as an amnesic agent.”

**Healthy Sleep Habits, Happy Child**  
Weissbluth, 1999, p. 159.

#### For young infants, extinction induced crying is physiologically stressful.

- Crying increases heart rate and blood pressure, reduces blood oxygenation, and propels the release of cortisol. Prolonged crying amplifies these effects<sup>24</sup>.
- Animal studies have shown that extinction itself is particularly stressful—producing rapid, dramatic, and persistent increases in cortisol<sup>25</sup>.

#### Physiological stress levels may remain high after the infant has stopped crying.

- Animal studies of extinction found that, though behavior appeared to adapt, physiology did not. In one study, infant rats ceased calling for their absent mothers; however, their physiological arousal remained high<sup>26</sup>.
- The dissociation of observed behavior from adrenocortical activation makes it difficult to determine the absence of physiological stress simply by observing that the infant has fallen asleep<sup>27</sup>.
- Further, it is unknown how the presence of increased cortisol levels affects the brain-building processes that occur during sleep<sup>28</sup>.

#### The ability to modulate stress and return to homeostasis is age dependent.

- The ability to modulate distress (*self-soothe*) depends on the timing, type and intensity of the stress experienced. Stressors that are manageable at 12 months, may be disorganizing at younger ages<sup>29</sup>.
- Further, infants with difficulties in self-regulation are less capable of modulating intense stress or withdrawing from overwhelming stimuli<sup>30</sup>. For these infants, who display a larger cortisol responses to stress<sup>31</sup>, it is unknown how CIO impacts their neuropsychological development.

#### Empirical evidence of the safety of prolonged crying in infancy could not be found.

- Both researchers and popular parenting advice assert that an infant will not be harmed by the crying involved precipitated by CIO<sup>32</sup>; however, no empirical evidence could be found to support this point.

**In the absence of adequate data on the effects of prolonged crying and extinction on infants, the safety of CIO in the first year cannot be supported.**

### 5 Rethinking CIO: Infant mental health perspectives are needed.

Discourse on infant sleep problems is currently driven by the pediatric community. As such, infant sleep is viewed as a largely behavioral event<sup>33</sup> shaped and perpetuated by parental responses. Within this context, responsiveness is framed as problematic behavior<sup>34</sup>.

**In the absence of transactional, dyadic perspectives, the socioemotional and contextual aspects of infant sleep have been largely discounted or overlooked.**

#### Rethinking CIO: The family context.

An infant mental health perspective on CIO raises significant questions about the potential repercussions of sleep training techniques for infants, parents and families.

#### Individual Needs

- How does CIO interface with individual capacities (e.g. caregiver mental health, existing family stressors, etc.)?
- How does CIO interface with infants at various stages of development? Are some infants being left to cry too long at very early ages?
- How does the implementation of CIO affect parental self-concept or perceptions of the infant? How might CIO affect an infant’s emerging internal working model?
- How do parental working models influence the experience of implementing CIO?

**Advice in Popular Parenting Media:**  
“A baby must adapt to the existing family; the existing family does not adapt to a baby.”

*12 Hours Sleep by 12 Weeks*  
Giordano & Abidin, 2006, p. 16

#### Relationship Needs

- Does CIO affect parental responsiveness overall? Does CIO convey the notion that unwanted infant behavior may be controlled through the withdrawal of attention?
- What does CIO convey to parents about the meaning of crying?

**More research is needed into the systemic effects of infant sleep interventions—effects that may extend beyond whether or not an infant abandoned crying and stayed asleep.**

[In the behavioral view of infant sleep], caregiving is constructed as behavior management, and is underpinned by the idealization of all-night sleep as an achievable norm and an unquestioned . . . belief in the trainability of infants.

Rowe, J. (2003)  
*Nursing Inquiry*, 10(3), p. 185.

#### Rethinking CIO:

#### Nightwaking as a symptom rather than a problem.

- A variety of relevant family variables have been significantly related to infant nightwaking: breastfeeding<sup>35</sup>, attachment status<sup>36</sup>, parental psychopathology<sup>37</sup>, maternal depression<sup>38</sup>, family stress<sup>39</sup>, and relational disruption<sup>40</sup>.
- Parents who are anxious or depressed are also more likely to report their infant’s waking as problematic—even when sleep behavior falls into normal ranges<sup>41</sup>.
- Nightwaking is also more likely in infants with temperamental or regulatory sensitivities because of their decreased capacity to buffer stimuli<sup>42</sup>. It is currently unknown how CIO interfaces with these infants who may also have a decreased capacity to self-calm or withdraw from distress<sup>43</sup>.

#### Rethinking CIO:

#### Sleep problems as a port of entry for infant mental health.

- In the rush to provide one-size-fits-all sleep training information, professionals are missing a valuable opportunity for inquiry into relevant variables that contribute to or are impacted by nightwaking.
- Future research into CIO and other infant sleep interventions needs to account for the context within which nightwaking takes place.
- More research is needed to develop interventions that are context aware—helping infants achieve age-appropriate amounts of sleep, while supporting parents’ instincts to nurture and respond.

