

# Evaluating “Jealousy” in Infants: A Behavior-Analytic Approach

Maria G. Valdovinos, Samantha M. Cermak, Adam Gallenberg, and Dustin F. Baker

*Psychology Department, Drake University*

## Abstract

The purpose of this study was to evaluate the negative behaviors emitted by infants during conditions of divided maternal attention from a behavior-analytic perspective. Three infants (21-29 weeks of age) and their mothers participated. Seven conditions were run with the mother-infant dyads (i.e., Control, Neutral Face/Toy, Neutral Face/No Toy, Magazine/Toy, Magazine/No Toy, Doll/Toy, Doll/No Toy). Negative infant behaviors were measured to determine if they occurred more often when mothers did not fully engage with their infants (i.e., engaged in neutral stare, reading a magazine, or talking to a life-like, life-size infant doll) or when infants did not have stimuli with which to engage (i.e., toy). Negative behavior occurred more often in the absence of toys regardless of maternal behavior. This finding suggests that negative behaviors are perhaps more likely accounted for by the lack of interaction rather than infant jealousy.

## Keywords

jealousy, maternal attention, infants

In the field of developmental psychology, it is presumed that children younger than two years of age have not developed self-aware emotions such as jealousy, embarrassment, and shame; however, research suggests that jealousy may actually be present in infants as young as 6 months (Hart & Carrington, 2002; Hart, Carrington, Tronik, & Carroll, 2004; Hart, Field, Del Valle, & Letourneau, 1998). In a study by Hart and Carrington (2002), researchers measured negative infant behaviors (e.g., angry or sad facial expressions), under two conditions: a) mothers interacted with a life-like doll; and b) a control condition in which mothers expressively read a storybook with musical sounds. In neither condition did mothers directly attend to their infants. The results revealed that infant gaze to the mother was closely the same in both the life-like doll and control conditions; however, negative behavior from the infant increased an average of almost 20% in the life-like doll condition relative to control. The authors concluded that the increase of negative behavior towards the social object was due to an early form of jealousy because the life-like doll created a loss of exclusive attention from the infant's primary attachment (Hart & Carrington, 2002). In a similar study conducted by Hart and colleagues (2004), three conditions were run which included mothers attending to a life-like doll (which was hypothesized to evoke jealousy), face-to-face play with their infant, and still-face stare at their infant. Heightened negative behaviors were recorded during conditions when mothers stared at their infants with a still-face and when they engaged with an infant-sized doll. The researchers interpreted these results to support the hypothesis that mother's engagement with an infant-sized doll is as distressing as their lack of engagement with them.

Although the results of these studies reflect increased occurrence of negative behaviors in conditions when mothers attended to the infant-sized doll, each of the studies discounted the effect of the infant's history of reinforcement for negative behav-

ior, as well as how the current environment is affecting infant behavior. Past reinforcers, such as the home environment, other siblings, daily interaction with the primary attachment figure (usually the mother), and sleep/eat schedule can impact infant behaviors in multiple environments (Pelaez & Gewirtz, 1997). Furthermore, a child's behavior is interdependent with the environment (Bijou, 1995). Results from Hart's research may show heightened negative emotions during the jealousy evocation sessions, but it is possible that other variables may account for the negative behaviors observed. Thus, the purpose of this research is to determine if negative behaviors displayed by infants are due to mother's diverted attention to another “infant” or if, indeed, other variables account for the negative behaviors observed.

## METHOD

### PARTICIPANTS AND SETTING

Three infants between 21 to 29 wks of age and their mothers participated in the study. Infants were recruited to the study via a flyer posted in a local daycare. Inclusion criteria were: first born infants, born full-term, and did not have a diagnosed disability. Phone interviews with mothers were conducted in advance of participation in the study to determine eligibility, gain verbal consent, and ask mothers to ensure their infant was fed, changed, and had a good amount of rest before the study. The experiment was conducted in a room approximately seven ft. by seven ft. The room consisted of a high chair for the infant and a chair for the mother. Video recordings were made via an observation window.

### RESPONSE MEASUREMENT AND INTEROBSERVER AGREEMENT

Data were collected using a 5-sec partial-interval, paper-pencil system. The following behaviors were measured: negative infant behavior, maternal attention, infant toy engagement, and infant

**Table 1.** Mean percentage of 5-s intervals with negative behavior, maternal attention, toy engagement and strap manipulation across sessions.

	Sessions						
	1	2	3	4	5	6	7
Negative Behavior	0%	0%	29%	19%	54%	29%	26%
Maternal Attention	0%	0%	0%	32%	14%	33%	33%
Toy Engagement	97%	57%	0%	61%	0%	59%	64%
Strap Manipulation	0%	39%	51%	0%	22%	4.2%	5.6%

high chair strap manipulation (some of the infants had not used a high chair and so the chair and its accoutrements themselves were novel). Operational definitions of negative behavior were obtained from mothers describing their child's negative behavior during the phone interview. Maternal attention was operationally defined as the mother giving physical contact, vocal communication, and/or positive facial expressions to the child. Toy engagement was defined as when the infant engaged in any physical contact with the toy. Strap manipulation was defined as any physical contact with the strap (i.e., hands, mouth).

Interobserver agreement was conducted for 100% of sessions for all participants and calculated by dividing the number of intervals in which both observers agreed on the occurrence of the behavior by the total number of intervals. Mean agreement for negative behavior was 91% (range, 79% to 100%), maternal attention was 98.95% (range, 95.83% to 100%), toy engagement was 96.23% (range, 88.24% to 100%), and strap manipulation was 90.55% (range, 83.3% to 100%).

## DESIGN AND PROCEDURE

The experiment utilized a single-subject, multi-element design. Seven conditions were presented in random order and each infant experienced each condition once. Each session was 2-min long with a 1-min break between each session. The sessions were as follows:

- Control: mother gave complete attention to her infant and interacted with the infant who also had access to many different toys.
- Neutral Face/Novel Toy: mother had a neutral facial expression and the infant was given a novel toy.
- Neutral Face/No Toy: mother had a neutral facial expression but the infant did not have access to a toy.
- Magazine/Toy: mother read a magazine and did not attend to her infant but the infant had access to a novel toy.
- Magazine/No Toy: mother read a magazine and did not attend to her infant and the infant did not have access to a toy.
- Doll/Toy: mother attended to a life-like doll while not attending to her infant but the infant had access to a novel toy.
- Doll/No Toy: mother attended to a life-like infant doll while not attending to her infant and the infant did not have access to a toy.

## RESULTS

Figure 1 presents mean percentage of 5-s intervals in which infants engaged in negative behavior relative to the delivery of maternal attention, toy engagement, and strap interaction. The highest percentages of intervals with negative behavior were observed in the following conditions: Neutral Face/No Toy (54%); Magazine/No Toy (46%); and Doll/No Toy (44%). When toy interaction was the highest (Control; Neutral/Toy; Magazine/Toy; Doll/Toy), the percentage of intervals with negative behavior was the lowest ranging from 0% to 4%. When toy interaction was the lowest (Neutral Face/No Toy; Magazine/No Toy; Doll/No Toy), the percentage of intervals with negative behaviors was the highest, ranging from 36% to 63%. The conditions that had the highest percentage of intervals of strap manipulation (Magazine/No Toy, 39%; Doll/No Toy, 29%) were also conditions with relatively high percentage of intervals with negative behavior (Magazine/No Toy, 36%; Doll/No Toy, 47%).

To determine if negative behaviors were a result of the duration of time spent in the high chair, we evaluated the data for all variables measured across time. An analysis of these data show that infants were more likely to show distress towards the end of the research period than the beginning, however, this was not a continuous and steady increase (See Table 1).

## DISCUSSION

This study sought to determine if negative behaviors displayed by infants were indeed due to a mother's divided attention to another infant, which others have interpreted as evidence of jealousy (e.g., Hart et al., 2004), or if other environmental variables could account for this observation. This study replicated some earlier findings. Specifically, when mother's attention was withheld, infants demonstrated increased negative behavior or, in other words, became distressed. Furthermore, infant distress was greater when mothers were attending to another "infant" rather than when mothers were engaged in an alternate activity (i.e., reading a magazine). However, contrary to Hart and Carrington (2002), we found that negative infant behaviors occurred less often in the "Doll/No Toy" condition than the "Neutral Face/No Toy" condition. Additionally, upon further data analysis, it was apparent that negative behavior decreased when infants had access to toys, seemingly independent of their mother's behavior. This observation brings into question the interpretation of previous research findings.

Although previous research has suggested that jealousy is present at six months of age, none of the previous research manipulated additional variables that might influence infant be-

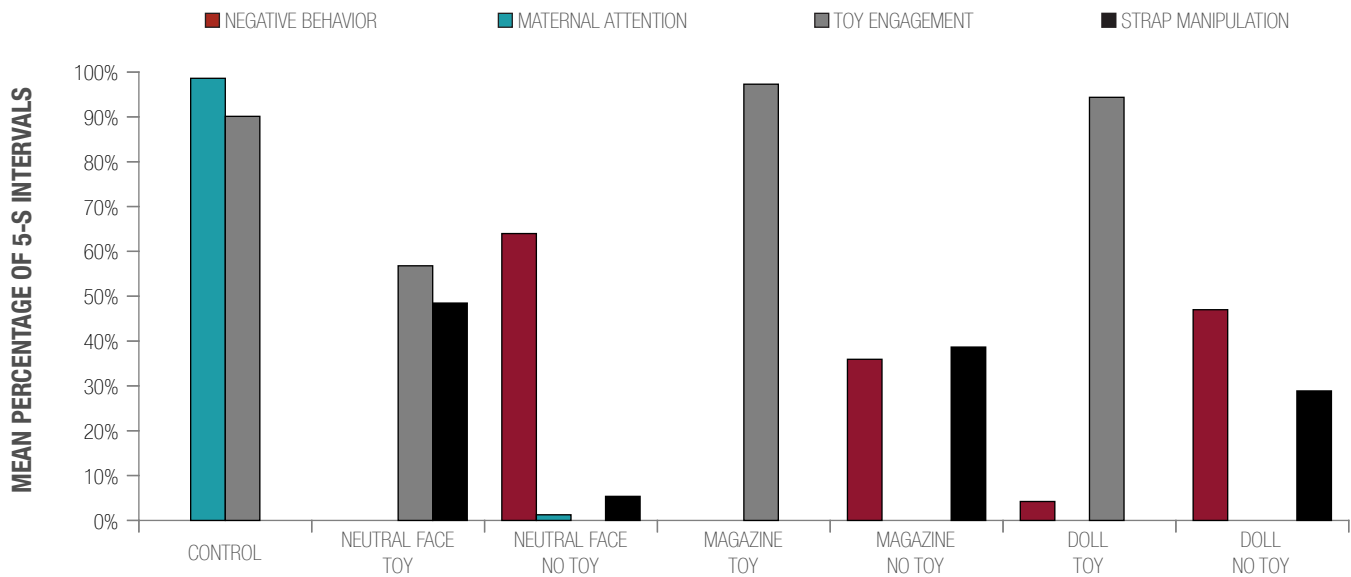


Figure 1. Mean percentage of 5-s intervals with negative behavior, maternal attention, toy engagement, and strap manipulation within each condition.

havior. As we know, behavior is under the control of various contingencies. Our interpretation of these data is that infants are not necessarily protesting divided maternal attention but may instead be manding interaction. The interaction can be with their mothers, or, as we saw in this study, can be with inanimate objects.

Admittedly, there were limitations to this study. For example, the high chair was novel for two of the infants, and this unfamiliarity may have contributed to increased negative behavior, as increased strap manipulation was observed in the presence of negative behavior (see Figure 1). Another limitation is that we did not provide infants with the means by which to mand interaction. In an earlier pilot study, conditions in which mothers delivered attention contingent upon negative behaviors (within the Magazine/Toy, Magazine/No Toy, Doll/Toy, Doll/No Toy conditions) were also conducted; however, session analysis revealed that negative behaviors increased as participation duration increased suggesting that the negative behaviors observed were perhaps a function of the length of participation in the study rather than the contingencies in effect. Establishing a way for the infants to mand maternal attention would facilitate clearer interpretation of infant responses.

Alternate explanations may also be provided for our results. For example it is possible that infants were distracted by the toy and impervious to their mother's interaction with the life-like infant doll. However, if that were the case we would have anticipated seeing zero occurrences of negative behavior in any condition in which there was a toy available. Instead, we observed negative behaviors in the Doll/Toy condition. Despite the limitations, this research provides an alternate interpretation of the negative behavior displayed by infants than current explanations. Future research should be conducted to further evaluate if infants this young are indeed manding interaction rather than expressing distress over maternal divided attention.

## REFERENCES

- Bijou, S. W. (1995). *Behavior analysis of child development*. Reno, NV: Context Press
- Hart, S. L., & Carrington, H. A. (2002). Jealousy in 6-month-old infants. *Infancy, 3*, 395-402.
- Hart, S. L., Carrington, H. A., Tronick, E. Z., & Carroll, S. R. (2004). When infants lose exclusive maternal attention: Is it jealousy? *Infancy, 6*, 57-78.
- Hart, S. L., Field, T., Del Valle, C., & Letourneau, M. (1998). Infants protest their mothers' attending to an infant-size doll. *Social Development, 7*, 54-61.
- Pelaez, M., & Gewirtz, J. L. (1997). The context of stimulus control in behavior analysis. *Environment and behavior, 30*-42.

## AUTHOR CONTACT INFORMATION

### MARIA G. VALDOVINOS<sup>1</sup>

Drake University  
Psychology Department  
2507 University Ave  
Des Moines, IA 50311  
(515) 271-2847  
maria.valdovinos@drake.edu

### ADAM M. GALLENGER

University of Kansas  
4700 W 27th St. Apt. LL3  
Lawrence, KS 66047  
507-398-9614

### SAMANTHA CERMAK, B.A.

Drake University  
samanthacermak@gmail.com

### DUSTIN BAKER, B.A.

Iowa State University  
dfbaker@iastate.edu

<sup>1</sup> Corresponding author.