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Assessing relative preference for and reinforcing effectiveness of social consequences

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Assessing Relative Preference for and Reinforcing Effectiveness

of Social Consequences

A Thesis Presented

by

Sarah Johnson

The Department of Counseling and Applied Educational Psychology

In partial fulfillment of the requirements

for the degree of

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in the field of

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Thesis Title: Assessing Relative Preference for and Reinforcing Effectiveness of
Social Consequences

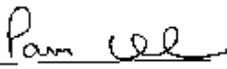
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**Assessing Relative Preference for and Reinforcing Effectiveness of Social
Consequences**

by

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Submitted in partial fulfillment of the requirements for the degree of
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Assessing Relative Preference for and Reinforcing Effectiveness
of Social Consequences

Table of Contents

ABSTRACT.....	2
INTRODUCTION.....	3
METHOD.....	9
Participant.....	9
Setting and Materials.....	10
Dependent Variable and Response Definition.....	10
Measurement Method and IOA.....	11
Procedure.....	11
RESULTS	13
DISCUSSION.....	14
REFERENCES.....	17
FIGURE CAPTIONS.....	20
FIGURES.....	21

Abstract

Although tokens and other contrived reinforcers are widely used in applied settings, social reinforcement, a more natural form of reinforcement, has been shown to maintain behaviors for developmentally disabled children including those with autism. A better understanding of an individual's preference for certain social consequences may allow for more effective use of social consequences in applied settings. The purpose of the present study, a replication of Smaby, MacDonald, Ahearn, and Dube (2007), was to identify reinforcing forms of social attention for 5 boys who attended a school for children with autism. The results of this study indicate that social consequences produced response rates higher than extinction conditions and, for 4 of the 5 participants, praise functioned as the most preferred reinforcer.

Assessing Relative Preference for and Reinforcing Effectiveness of Social Consequences

Positive reinforcement is one of the most widely used procedures in applied behavior analysis (ABA). Positive reinforcement occurs “when a response is followed immediately by the presentation of a stimulus and, as a result, similar responses occur more frequently in the future” (Cooper, Heron, & Heward, 2007, p. 258). Potential reinforcers for an individual can be determined by various preference assessments. Pace, Ivancic, Edwards, Iwata, and Page (1985) identified one of the first systematic methods for assessing preference for individuals with disabilities. This procedure, sometimes referred to as the Pace procedure or single-stimulus (SS) procedure, involves presenting a variety of stimuli individually and measuring approach to each stimulus. The SS procedure is useful for identifying preference in some individuals who may be unable to make reliable choices among two or more stimuli. A potential limitation of this procedure is that it may provide false positives. That is, some individuals will approach any stimulus presented by a therapist. These stimuli, although approached, may not function as effective reinforcers.

Fisher et al. (1992) developed a paired-stimulus (PS) procedure that forces the participant to choose between two stimuli presented on each trial. This results in more differentiated levels of preference. However, a limitation to the PS procedure is the length of time it takes to administer. To address this shortcoming DeLeon and Iwata (1996) investigated the multiple stimulus without replacement (MSWO) procedure. In the MSWO procedure the items were randomly organized onto a table in front of the participant in a straight line. The participant was prompted to select an item and then the remaining items were re-presented without replacing the item chosen. The MSWO provides a hierarchy of preference while requiring a relatively short duration to complete. The SS, PS, and MSWO procedures can be used to systematically identify

preferences. Once preferred items are identified, reinforcer assessments may be conducted to determine if the preferred stimuli function as reinforcers.

The SS, PS, and MSWO procedures are frequently used to identify primary reinforcers. Primary reinforcers can be very effective when used in clinical settings, however they do have limitations. One limitation to primary reinforcers (e.g., edible stimuli) is that they are subject to the effects of motivating operations. With frequent use, the effects of satiation diminish their reinforcing power. Also, the delivery of primary reinforcers and many activity reinforcers may interrupt chains of behavior because the individual must pause to contact the reinforcer (consume the edible item or engage with the activity). Further, these reinforcers may not always be available immediately following a target behavior, or may not be available at all in some environments. Finally, in some cases frequent delivery of edible primary reinforcers may not be socially acceptable. Some of the problems associated with primary reinforcers can be avoided with the use of conditioned reinforcers.

A conditioned reinforcer is an initially neutral stimulus that is established as a reinforcer through a history of pairing with a primary reinforcer or another conditioned reinforcer (Cooper et al., 2007). Conditioned reinforcers have several advantages over primary reinforcers. For example, delivering a conditioned reinforcer such as a gold star or token may allow the practitioner to reinforce behaviors more immediately. Conditioned reinforcers can also be used to reinforce a behavior without interrupting chains or sequences of behavior. Some forms of conditioned reinforcers can be accumulated and exchanged at a later time. However, in some situations the reinforcing potential of a conditioned reinforcer may still be altered by the effects of motivating operations. For example, when a conditioned reinforcer is established by pairing with only a single primary reinforcer, the conditioned reinforcer is sensitive to the same

motivating operations as the primary reinforcer (Moher, Gould, Hegg & Mahoney, 2008). This limitation can be averted by utilizing generalized conditioned reinforcers. “A generalized conditioned reinforcer is a conditioned reinforcer that as a result of having been paired with many unconditioned and conditioned reinforcers does not depend on a current EO for any particular form of reinforcement for its effectiveness” (Cooper et al., 2007, p. 270).

Although primary reinforcement can be useful and conditioned reinforcement addresses some of the limitations of primary reinforcement, the optimal reinforcer in many cases is a generalized conditioned reinforcer. Generalized conditioned reinforcement systems such as token economies are routinely used in applied settings due to their many advantages over primary reinforcement. Generalized conditioned reinforcers can be delivered immediately, are less likely to interrupt chains of behavior, and they are also less subject to the effects of motivating operations (Kazdin & Bootzin, 1972). This allows a generalized reinforcer to maintain its reinforcing properties even in states of satiation of a particular primary reinforcer. One of the key advantages to token economies is the extensive variety of “back-up” or primary reinforcers to be obtained through the exchange of tokens. Tokens can either be traded in immediately for a primary reinforcer or may be saved for more “expensive” and more reinforcing items when a certain number have accrued.

Some researchers have speculated that token systems are effective forms of reinforcement for individuals with autism because of their tangible nature (Kazdin & Bootzin, 1972). For example, the number or amount of token earned may hold a quantifiable relation to the primary (or back-up) reinforcement available. Tokens are portable and can be possessed far from where they were earned. They can sometimes be exchanged for primary reinforcement through machines without a third party (eliminating the possibility a primary would lose

reinforcing power due to the association with other stimuli that may be aversive). Finally, tokens are durable, and may be present during the delay to the primary reinforcement (Kazdin & Bootzin).

For many individuals, social stimuli like praise or attention will function as generalized conditioned reinforcers. Skinner (1953) discussed conditioned reinforcement in the form of social attention, approval, and affection. Research with typically developing children has frequently shown social praise to be an effective reinforcer (Hall, Lund, & Jackson, 1968; Hart, Reynolds, Baer, Brawley, & Harris, 1968; Thomas, Becker, & Armstrong, 1968). Social stimuli, when effective as conditioned reinforcers, have the advantages Kazdin and Bootzin (1972) cited. They also provide some additional benefits. Social attention is a naturally-occurring form of reinforcement in classrooms, community, and other settings. The use of contrived reinforcers, such as tokens, may not be appropriate in all settings; token boards and other tangible items associated with token economies may be stigmatizing in community or inclusion settings. For these reasons, social attention as a conditioned reinforcer may be more acceptable than tangibles or tokens.

Although “adult attention is one of the most powerful and generally effective forms of reinforcement for children” (Cooper et al., 2007, p. 273), some research has suggested that the developing behaviors of a child with autism are unaffected by the social environment (e.g., Lovaas et al., 1966). One of the diagnostic features of autism is a lack of social exchange. It is possible that the social nature of praise may prevent it from becoming an effective conditioned reinforcer for individuals with autism. However, attention has been shown to maintain the aberrant behaviors of children with various developmental disabilities, including autism (e.g., Lalli, Mace, Livezey, & Kates, 1998; O’Reilly, Lancioni, King, Lally, & Dhomhnaill, 2000;

Kodak, Northup, & Kelley, 2007; O'Reilly, 1999; Piazza et al., 1999; Fisher, Ninness, Piazza, Owen-DeSchryver, 1996; McGinnis, Houchins-Juárez, McDaniel, & Kennedy, 2010). If problematic behaviors can be maintained through socially mediated stimuli, it seems reasonable to assume that desirable behaviors can also be reinforced by socially mediated stimuli. In fact, this is exactly the approach advocated in function-based treatment of problem behaviors (Van Camp, Lerman, Kelley, Contrucci, & Vorndran, 2000; Mace, Page, Ivancic, & O'Brien, 1986; Lindberg, Iwata, Kahng, Deleon, 1999). How these social stimuli come to function as reinforcers for individuals with autism is an area for behavior analytic research.

Some behavior-analytic studies have identified factors that play a part in determining the effectiveness of social consequences. For example, Kazdin and Klock (1973) instructed the teacher of a classroom of developmentally disabled children to increase her use of contingent nonverbal attention on the students' attentive behavior. Attentive behavior increased for 11 of the 12 students in the increased nonverbal attention conditions. A study by Van Houten, Nau, MacKenzie-Keating, Sameoto, and Colavecchia (1982) showed several variables that influence the effectiveness of social attention as a punisher. Results from their Experiment 1 showed verbal reprimands to be more effective when paired with eye contact and physical attention (a firm grasp). Increased distance from the student when the reprimand was delivered decreased the efficacy of the verbal reprimand in Experiment 2. Reprimands delivered to one of two children reduced disruptive behaviors in both children in Experiment 3.

In a further study of the properties of attention that affect behavior, Kodak et al. (2007) evaluated the influence of six different forms of attention (i.e., reprimands, unrelated comments, tickles, eye contact, praise and verbal attention) when provided contingent on problem behavior. For one participant high rates of problem behavior were observed in the reprimands condition,

moderately high rates in the tickles condition, and the lowest rates were observed in the physical attention condition. For the second participant high rates were observed in both the reprimands and unrelated comments conditions indicating vocalizations may have maintained high rates of the problem behavior regardless of content. The Kodak et al. study shows that the effectiveness of various social stimuli as reinforcers differs within and between individuals.

The quality of attention may be an underestimated component of social attention as well. Gardner, Wacker, and Boelter (2009) compared high quality attention (e.g., frequent eye contact, close proximity, and enthusiastic praise) with low quality attention (e.g., no eye contact, far proximity, and negative verbal statements). Their results showed high quality attention (HQA) biased choice towards academic tasks for two children whose problem behavior was maintained by escape. In addition, decreased levels of problem behavior were observed in all settings when HQA was provided.

Because of the variability in effectiveness of different social consequences as reinforcers within and between individuals, careful consideration should be put into their selection for use in behavior programming. Just as edible or activity preferences are systematically determined as a first step for identifying reinforcers, it is also important to ascertain individual preference for and reinforcing efficacy of socially mediated stimuli. Smaby et al. (2007) describe a method for quick evaluation of preference for and reinforcing power of socially mediated stimuli. Using a multielement design the authors assessed three forms of social attention: tickles, praise and head rubs. In each session, Smaby et al. presented one form of social consequence contingent on a single free operant response. Rate of response was used as a measure of preference and reinforcer value of the various social consequences. Rate of responding for each of the social consequences was compared to an extinction condition to determine social reinforcer

effectiveness. General preference was believed to correlate with increased rates of the target response; in other words, the social stimulus with the most reinforcing power was determined to be the most preferred stimulus. The Smaby et al. procedure is valuable for assessing the reinforcing effectiveness of various social stimuli. The present study was a replication of Smaby et al. with five individuals diagnosed with autism.

Method

Participants

Five boys who attended a day school for children with autism participated in this study. Thomas was a 6 year old boy who followed most simple one- and two-step directions. He expressed wants and needs with short sentences but had little spontaneous speech. Glen was a 9 year old boy who followed simple directions. He used mands and tacts with single words and could repeat sentences but his speech was difficult to understand. Harry was an 11 year old boy who followed three-step directions and expressed wants and needs in full sentences. Fred was a 6 year old boy who had recently enrolled in the school. He followed three-step directions and expressed his wants and needs with full sentences. Miles was an 11 year old boy who followed three-step directions and expressed wants and needs with full sentences.

All boys were targeted for transition to a typical classroom setting wherein social stimuli would be the primary mode of reinforcement. They were chosen to participate in this study because assessing relative preference and reinforcing power of social consequences would allow practitioners to utilize social consequences that would have the most reinforcing effect on their behaviors.

Setting and Materials

Sessions were conducted in a partitioned cubby in a classroom at the participants' school. Inside the cubby were a desk, two chairs, a tripod with digital camera, and a container with materials. Either on the desk or in the container were 320 plastic chips in four colors (e.g., 80 red, 80 yellow, 80 blue, and 80 green), two timers, a large white piece of paper, pens and data sheets on a clipboard.

Dependent Variable, Response Measurement and IOA

The dependent variable was the frequency of passing a chip which was defined as the participant picking up a chip from the table and placing it into the experimenter's hand. If more than one chip was passed only one response was scored. If the chip fell out of the experimenters hand a response was not scored.

Responses were scored by counting total number of responses per taped session. Response frequency was later converted to response rate. A second, trained observer collected data on 33% of sessions for each participant. Agreement for each session was calculated by dividing the smaller number of recorded responses by the larger number of recorded responses and converting into a percentage. Average agreement across participants ranged from 91% to 99%. Average agreements were: 91% (range: 80%-100%) for Thomas, 96% (range: 89%-100%) for Fred, 99% (range: 96%-100%) for Harry, 95% (88%-100%) for Miles, and 95% (range: 87%-100%) for Glen.

Procedure

The three social conditions assessed were tickles, back pats, and praise. Sessions were conducted as pairs, with an extinction session preceding every social consequence condition. At the beginning of every extinction session the experimenter told the participant, “Let’s go for a walk” and started a timer set for 2 min. The participant earned preferred edible items or tokens for appropriate walking but all edibles were consumed before entering the cubby to begin the experimental sessions. The experimenter used gestures and refrained from touching, talking to, or making eye contact with the participant as much as possible during the 2-min walk. At the end of the 2-min walk, the experimenter and participant returned to the cubby; the experimenter gestured for the participant to sit, turned on the digital camera and sat with the participant. The experimenter poured the red chips onto the desk under the large white piece of paper and put the empty container under the desk. She placed her left hand palm up on the table in front of the participant and said: “pass a chip.” Five of these demonstration trials were conducted, in which the experimenter manually guided five responses. Following each response, the experimenter closed her hand preventing further responses for 2 s. The experimenter did not smile or make eye contact with the participant. When five responses had been prompted, the experimenter covered the red chips with the white paper and set a timer for 5 min. She then uncovered the chips, started the session timer, and said “you can pass a chip as much as you want, but you won’t earn anything” while placing her left hand open palm up on the table in front of the participant. The free operant component of the extinction session was terminated after 1 min of no responding or a maximum of 5 min. When the timer sounded, the experimenter covered the remaining chips with the white paper and started a timer for 30 s. During this time she recorded

session data, cleared the red chips from the table and set up materials for the social consequence condition.

At the end of the 30-s inter-session interval the experimenter uncovered the chips for the scheduled social consequence condition (blue chips for tickles, green chips for back pats, and yellow chips for praise) and stated the name of the condition. The experimenter placed her open hand palm up on the table and manually guided five responses. After each response the experimenter closed her hand preventing further responses and provided the social consequence for that condition. In the tickles condition the experimenter lightly tickled the participant's torso for 2 s while saying "tickles" following each response. In the back-pats condition the experimenter provided back-pats for 2 s while saying "back-pats" following each response. In the praise condition the experimenter provided a verbal praise statement including, "Great job", "good work", and "that's right" in an emphatic tone following each response. Once five responses had been prompted the experimenter covered the chips and set a timer for 1 min. She uncovered the chips and said "you can pass a chip as much as you want and you will earn [x]." The experimenter stated either "tickles", "back pats" or "good job" depending on the consequence being assessed. She then started the 1-min session timer while placing her left hand palm up on the table in front of the participant. When the timer sounded the experimenter covered the chips with the white paper and started a timer for 30 s. During this time the experimenter cleared the desk and recorded session data. When the timer sounded the experimenter turned off the camera. If another pair of sessions was scheduled the experimenter said "let's go for a walk" and the procedure began again.

Results

All extinction sessions continued to the maximum duration of 5 min. Results for Thomas are shown in Figure 1. Although the results are not substantially differentiated, rates were highest when back pats were provided as consequences ($M = 11.3$). Tickles ($M = 9.0$) and praise ($M = 8.7$) when provided as consequences produced only slightly higher response rates than rates in extinction ($M = 7.5$). However, in all but two pairwise comparisons, the social consequence produced a higher response rate than extinction.

Results for Harry are shown in Figure 2. Rates were highest when praise was provided following responding ($M = 20.7$). Rates in the tickles condition ($M = 17.3$) and back pats condition ($M = 14.0$) were clearly higher than rates in extinction ($M = 9.6$). Further, the response rate in the social consequence condition was always higher than in the immediately preceding extinction condition and all social consequence conditions showed evidence of increasing trends.

Results for Miles are shown in Figure 3. Responding was highest in conditions with praise as a consequence ($M = 19.0$) while rates for back pats ($M = 13.0$) and tickles ($M = 14.3$) were moderately higher than rates in extinction ($M = 10.7$). As with Harry, the response rate in the social consequence condition for Miles was always higher than in the immediately preceding extinction condition.

Fred's results are depicted in Figure 4. Similar to Thomas, responding varied only slightly and was not substantially differentiated across conditions. Rates in the praise condition ($M = 12.7$) were slightly above those observed in back pats ($M = 11.3$) and tickles ($M = 10.3$). Response rates were lowest in extinction ($M = 8.9$). With only two exceptions, responding in the social consequence condition was higher than in the immediately preceding extinction condition.

Results for Glen are shown in Figure 5. Response rates in the praise ($M = 18.3$), tickles ($M = 15.0$) and back pats ($M = 13.3$) conditions were differentially higher than extinction ($M = 8.9$). In every case, responding in the social consequence condition was higher than in the immediately preceding extinction condition.

Figure 6 summarizes the response rates for all participants across all conditions. As can be seen in this figure, all social consequences produced higher average response rates than extinction for all participants. The highest response rate was seen during the contingent social praise condition for 4 of the 5 participants; while the highest response rate was seen during the contingent back pats condition for the remaining participant.

Discussion

The present study identified reinforcing social stimuli for all five participants. Although the social consequences produced higher response rates compared to extinction for all participants, the difference was small in some cases. The results of this study are consistent with previous research showing that different social consequences function differentially as reinforcers between and within individuals (Smaby et al., 2007).

Limitations to the present study relate to session duration, and consequence delivery. A limitation cited in the Smaby et al. (2007) study was the study's brief duration. The authors raised the question of whether a longer duration of exposure to the social consequences would yield different results. This is also a limitation in the present study. All extinction sessions ran to the maximum time allotment of 5 min and all social consequence conditions were 1 min. Perhaps different rates of responding would have been observed if the social consequence conditions were also 5 min in duration. The present study was intended to be a brief assessment

of the reinforcing effectiveness of social consequences, however additional data collection might have resulted in greater differentiation among the social consequence conditions. For at least one participant, an increasing trend was evident in the social consequence conditions.

Consequence delivery was another limitation to the current study. In two of the three social conditions some form of physical touch was assessed (i.e., back pats and tickles). In the praise condition vocalizations alone were assessed. However, because the experimenter labeled the tickles and back pats condition when the consequence was being delivered some form of vocal attention was being provided along with the physical. The use of vocalizations in all conditions may have created a confound. Further research could investigate whether different results are obtained when back pats and tickles are not accompanied by a vocalization.

In addition, the duration of consequence delivery may be another limitation of this study. The opportunity to respond was not available for 2 s following a response in all conditions. Slight variations in duration of the consequence delivery were difficult to control, however these could potentially have been confounds as they could have resulted in different opportunities to respond across conditions.

We sought to discover if relative preference could be shown through the present procedure. Although the differences were small in some cases, each participant showed preference for a specific form of social consequence. An interesting area for future research would be to compare the relative difference in reinforcing potency of the various social consequences with the relative difference in reinforcing potency of other types of reinforcers. For example, the response rate produced by praise for Miles was approximately 33% higher than the rate produced by the next highest social consequence, tickles. If a preference hierarchy for

edible stimuli was generated for Miles, what would be the relative difference in response rates produced by the highest and second-highest preferred edible items?

Future research could also investigate other forms of social reinforcement. Previous research on attention-maintained aberrant behavior has shown that all types of attention are not equally reinforcing (Kodak et al., 2007). Extending the assessment to include more forms of social consequences may be necessary to identify social reinforcers when results are undifferentiated. Another area for future research concerns the brief, intangible nature of most social consequences. Would a more tangible consequence, such as tokens or tally marks, be more effective than brief, intangible stimuli?

In summary, the present study demonstrated differential reinforcing effectiveness of social consequences for five children diagnosed with autism. For 4 of the 5 participants, praise was the most preferred and most effective social consequence. For all 5 participants, the social consequences produced higher response rates than extinction.

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Figure Captions

Figure 1. Results for Thomas. Response rates of passing a chip across sessions.

Figure 2. Results for Harry. Response rates of passing a chip across sessions.

Figure 3. Results for Miles. Response rates of passing a chip across sessions.

Figure 4. Results for Fred. Response rates of passing a chip across sessions.

Figure 5. Results for Glen. Response rates of passing a chip across sessions.

Figure 6. Mean response rate for all sessions across participants.

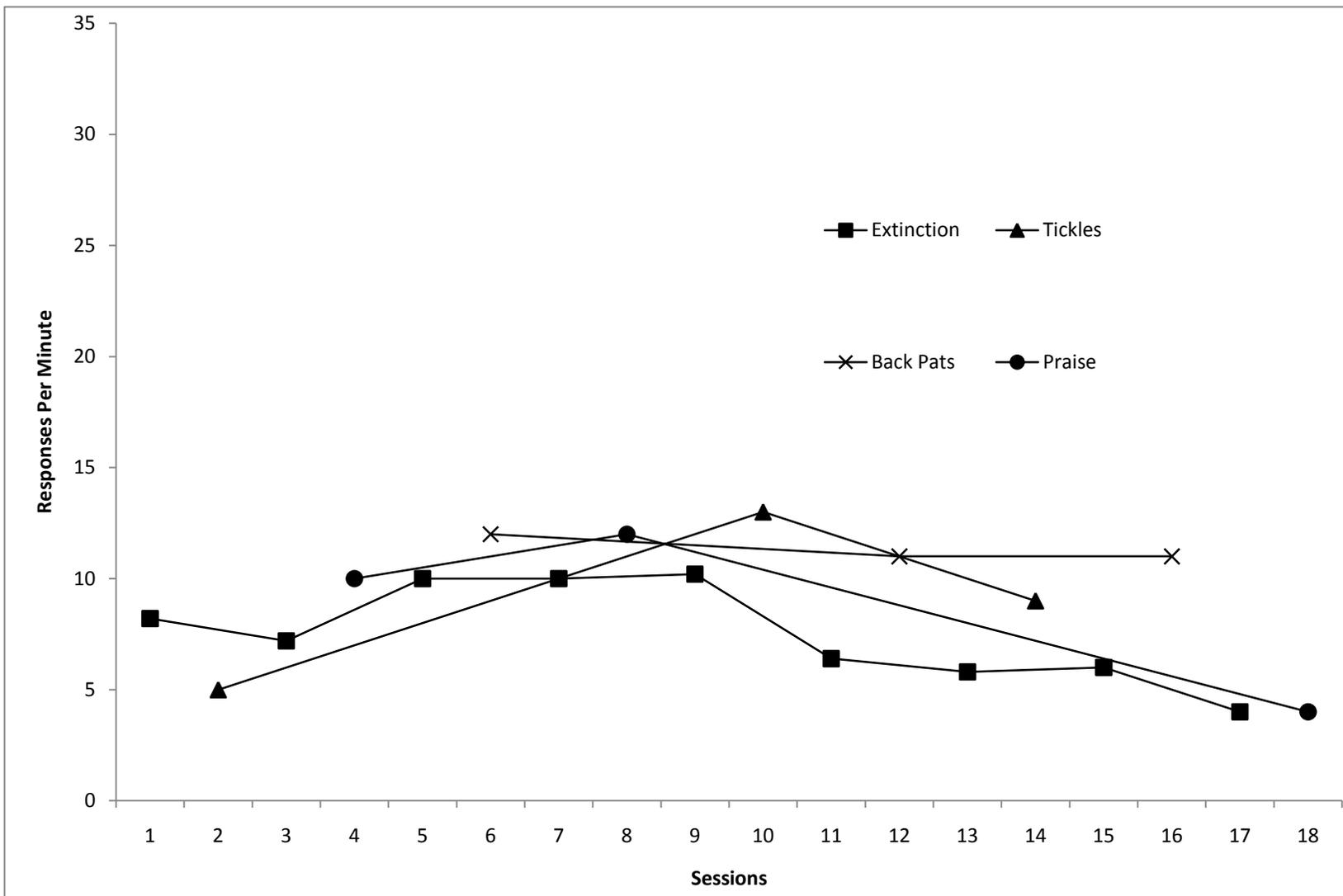


Figure 1

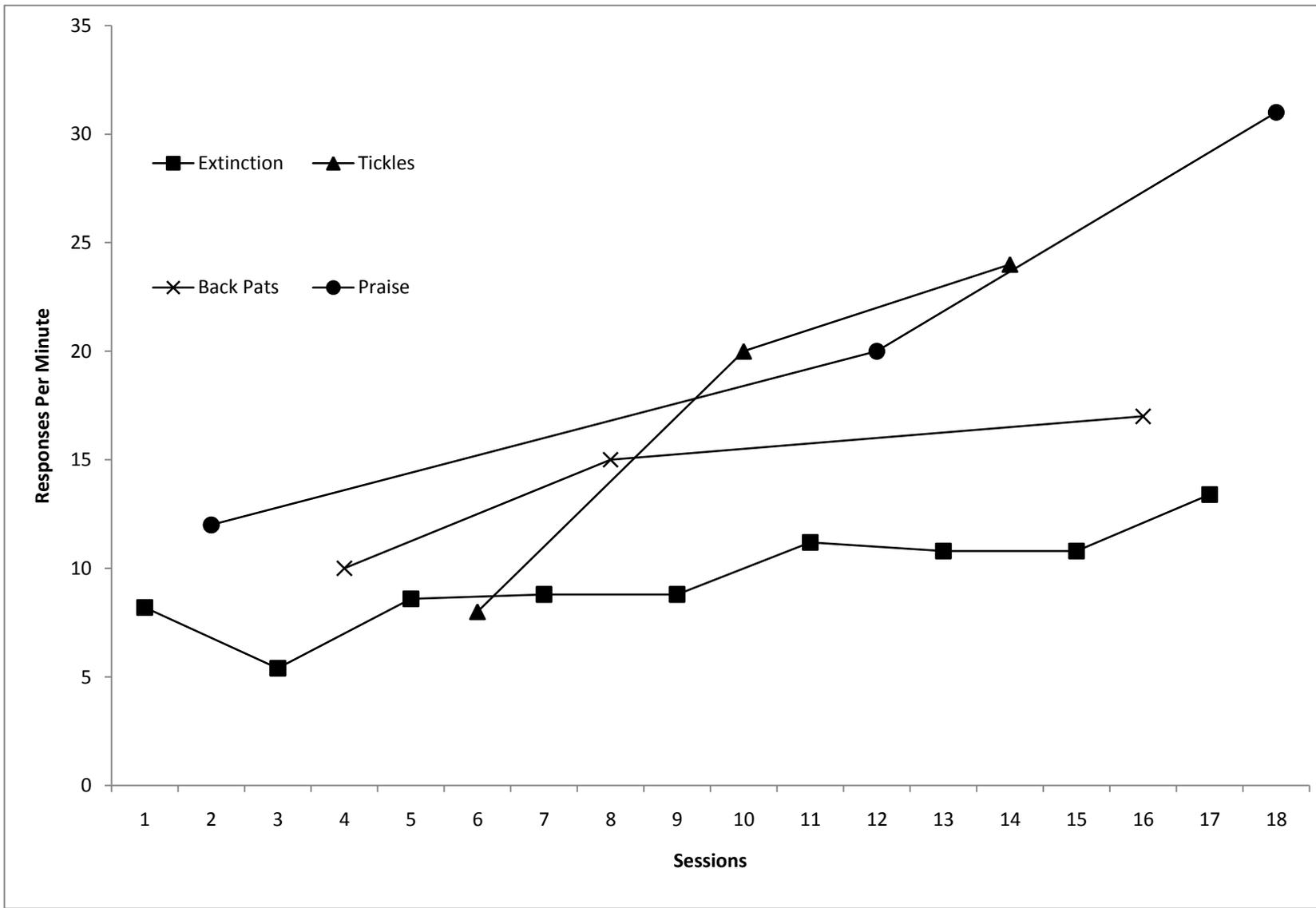


Figure 2

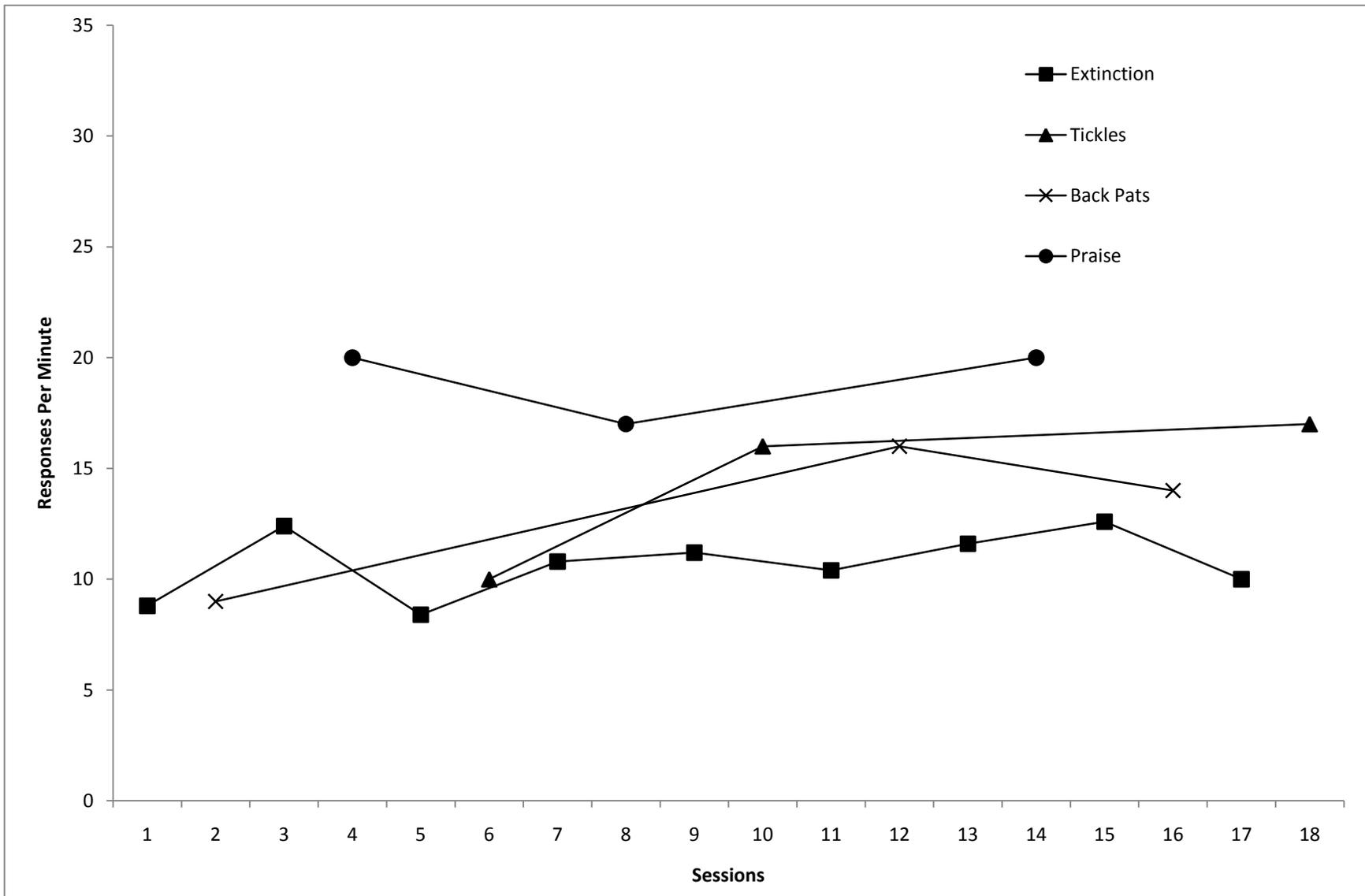


Figure 3

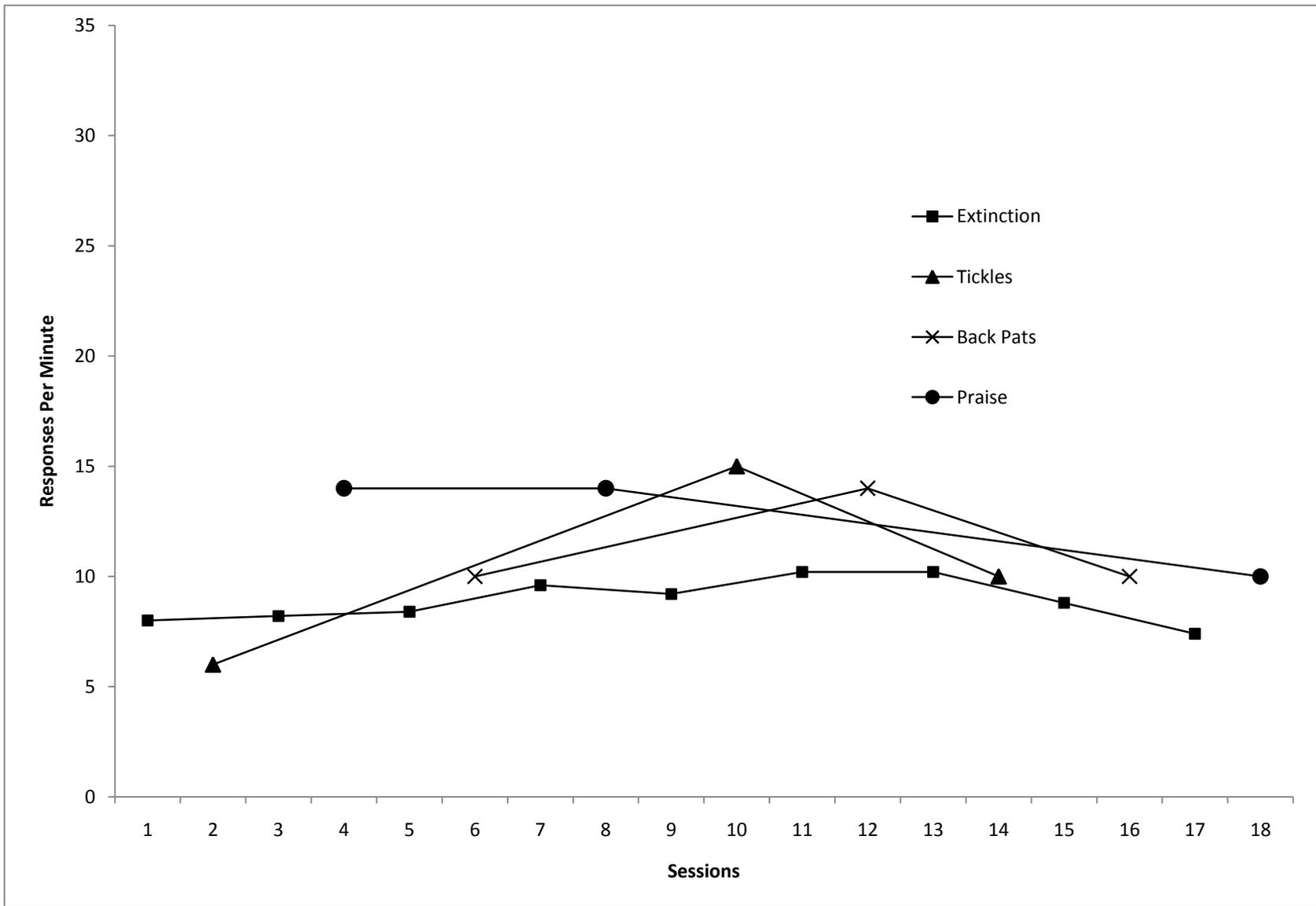


Figure 4

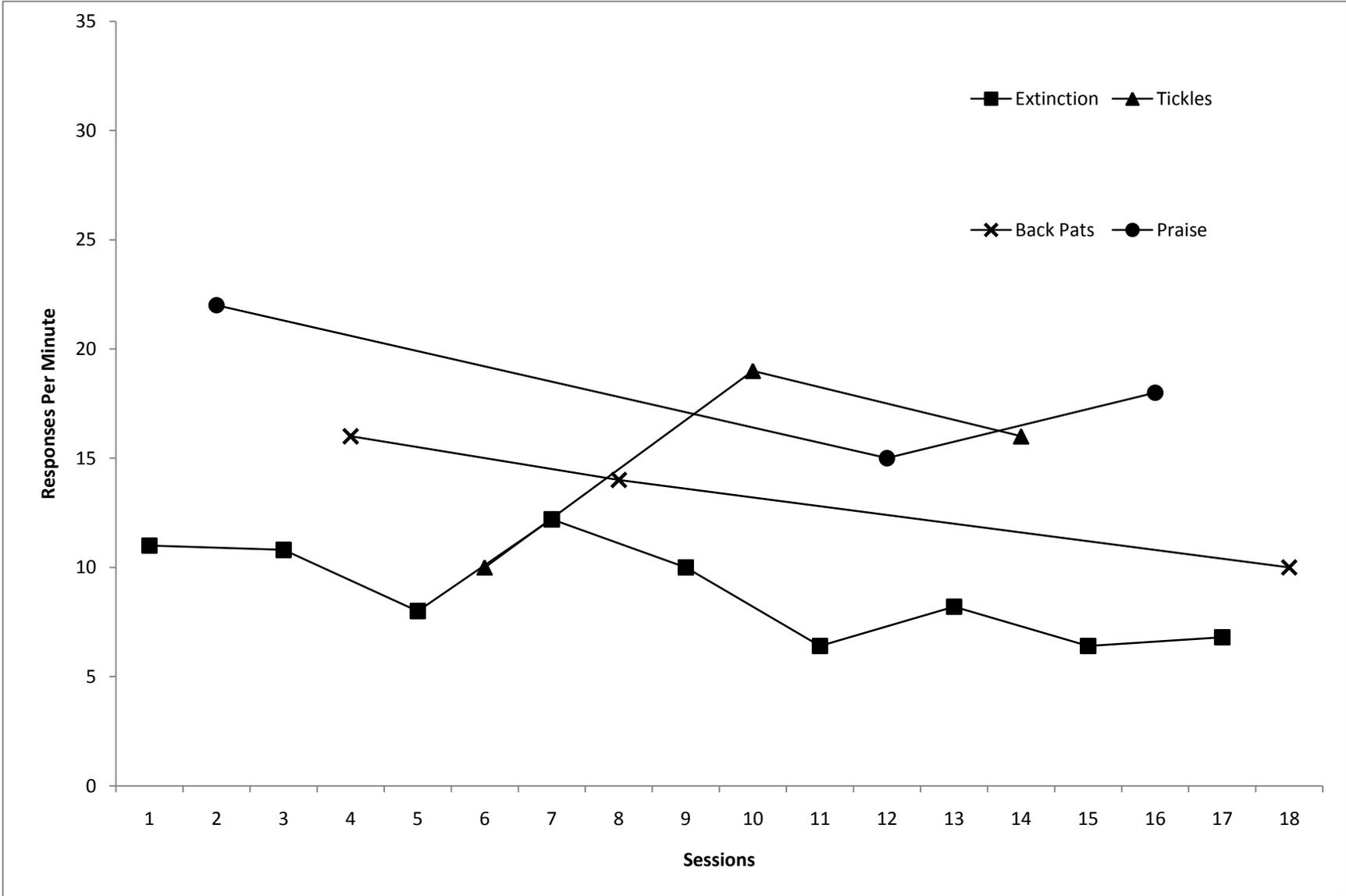


Figure 5

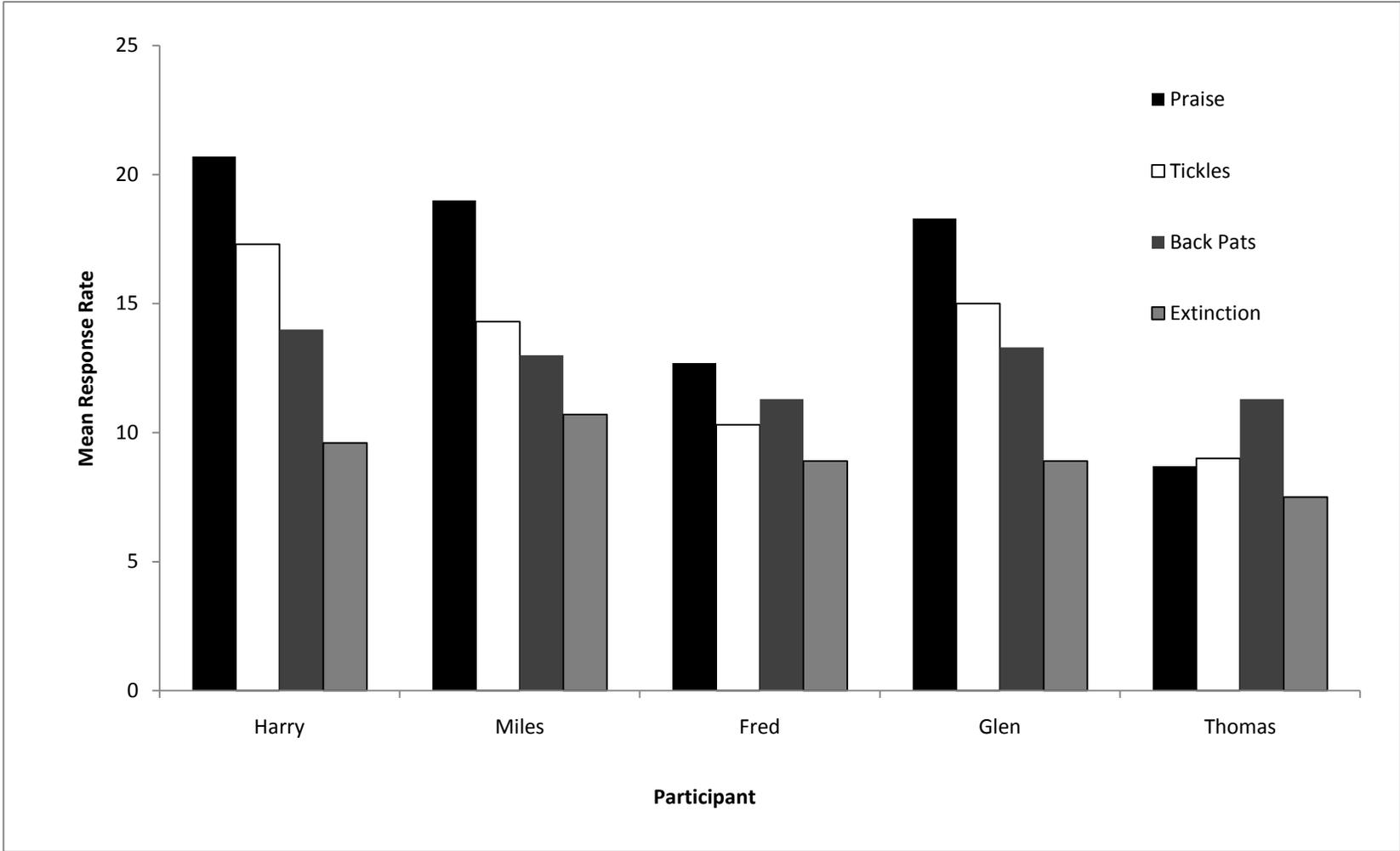


Figure 6