

# A Stimulus-Stimulus Pairing Procedure to Condition Attending to Faces as a Reinforcer

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## PARTICIPANT

Participant	Age	Diagnosis
A	5	ASD, receptive language disorder
B	2	Developmental Delays
C	8	ASD, Speech and language impairment

## SETTING

Each participant received instruction within their home or school environment either at a table/desk or on the floor.

## LITERATURE REVIEW

Conditioned reinforcement for observing others' faces is a foundational behavioral cusp. Once gained, it allows the learner to contact reinforcement from the presence of other individuals and leads to subsequent opportunities for contacting social contingencies (Rosales-Ruiz & Baer 1997).

Tsai & Greer (2006) studied a stimulus-stimulus pairing procedure to condition books as a reinforcer and studied the effects of books as a conditioned reinforcers on observing responses for the learning of textual responses for 4 preschool children (ages ranging from 2 years and 9 months through 4 years old). They measured the conditioned reinforcer value by number of observing response and choice of book stimulus during free play settings. The dependent variable consisted of the numbers of learn units to mastery of textual responses before and after conditioning books as reinforcers for observing responses. The intervention consisted of the implementation of a stimulus-stimulus pairing procedure until the books became the conditioned reinforcer. The results of this study showed that after books were conditioned as reinforcers, all four participants required fewer learn units to criterion on textual response than during their pre-intervention probes.

Maffei-Lewis, Singer- Dudek, & Dolleen-Day (2014) used a stimulus-stimulus pairing procedure as an independent variable to condition faces and voices as reinforcers, and then studied the effects of having faces and voices as conditioned on the following dependent variables:

- (1) The rate of learning/acquiring objectives across listener and speaker responses (learn units to criterion)
- (2) Observing responses to the presence of adults in the environment (orienting to adult across various scenarios)
- (3) Verbal operant emissions across 3 non-instructional settings (lunch, art, recess) as measured by total number of mands, tacts, sequels, and conversational units emitted

The experimental design was a non-concurrent, delayed probe design across participants with pre- and post- intervention probes. The participants consisted of 4 males with developmental disabilities (ASD, PDD, and unspecified developmental disabilities), ranging from ages 4-8.

The stimulus-stimulus pairing procedure proved to be an effective intervention for conditioning faces/voices as a reinforcer for 3 out of 4 participants. Additionally, each of the participants demonstrated accelerated rates of learning, 2) increases in attention to the presence of the adults (speaking or not speaking), and 3) increase in the emission of either tacts and mands, and/or the emergence of sequels and conversational units.

## REFERENCES

- Maffei-Lewis, Singer-Dudek, & Dolleen-Day (2014). The Effects of the Establishment of Adult Faces and/or Voices as Conditioned Reinforcers for Children with ASD and Related Disorders. ACTA DE INVESTIGACIÓN PSICOLÓGICA, 2014, 4 (3), 1621 – 1641 Retrieved August 25, 2022 from <https://www.sciencedirect.com/science/article/pii/S2007471914709706>
- Rosales-Ruiz & Baer (1997). Behavioral Cusps: Developmental and Pragmatic Concept for Behavior Analysis. JOURNAL OF APPLIED BEHAVIOR ANALYSIS, 1997, 30, 533-54. Retrieved September 4, 2022 from <https://www.nc-aba.com/wp-content/uploads/2022/03/Rosales-Ruiz-1997-Behavioral-Cusps.pdf>
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## ABSTRACT

A non- concurrent multiple baseline design was used to study the effects of a stimulus- stimulus pairing procedure to condition attending to faces as a reinforcer. The participants ranged from ages 2- 8 and have received diagnoses of ASD, related language disorders, and/or Developmental Delays. The independent variable was the stimulus-stimulus pairing procedure to condition attending to faces as a reinforcer. The dependent variable was the conditioned reinforcement of attending to faces as demonstrated by a post-assessment of observing responses to adults in the environment across a variety of scenarios. Results showed an increase in attending to the faces of others across conditions following meeting criterion of the intervention for 2 out of 3 participants.

## VARIABLES

*Dependent Variable:* Attending to faces as conditioned reinforcer, measured as duration in seconds in which the child attended to an adult's face.

*Independent Variable:* A stimulus-stimulus pairing procedure to condition attending to faces as a reinforcer. This consisted of pairing preferred vocal stimuli and other social reinforcement with visual attention to the instructor's face and terminating the reinforcement if the participant looked away.

## PROCEDURE

### PRE-INTERVENTION PROBE TRIALS

Prior to the invention, an assessment was conducted to determine if attending to faces was already a conditioned reinforcer. Between 1 to 5 probe trials across the following settings were measured: (1) Orienting towards the face of the speaker during play, (2) Orienting towards the face of the speaker at the table, (3) Orienting towards an individual entering the room, and (4) Orienting toward the face of an individual speaking the participant's name. A "+" was recorded for correct responding and a "-" was recorded for incorrect responding. The results were converted into a percent of opportunity.

### INSTRUCTION

The procedure was conducted at the table or on the floor with the participant. The instructor set a timer for 5-minutes. Using a stopwatch, they recorded the number of cumulative seconds that the participant visually attended to the face of the speaker through the 5-minute period, by starting the stopwatch when the participant was looking at the instructor and stopping the stopwatch when participant began looking away from the instructor. The instructor established the participant's attention without saying his/her name and without the use of physical prompts. They did this by making silly faces, blowing bubbles with gum, or using accessories (hats, scarves, etc.). Once visual attention was established, the instructor provided vocal (singing, talking) and/or tactile (tickles, rubbing) reinforcement. If the participant looked away, all reinforcement, and the stopwatch, stopped, and the instructor would re-establish the participant's attention as they did initially. When the participant resumed attending, the instructor resumed the reinforcement and the stopwatch recording. The session concluded when the 5-minute timer elapsed. Mastery criterion was set to 240/300 cumulative seconds (80%) across 1 session.

### POST-INTERVENTION PROBE TRIALS

After mastery criteria was met, the pre-intervention probe trials were repeated to determine if attending to faces had become a conditioned reinforcer. Between 1 to 5 probe trials across the following settings were measured: (1) Orienting towards the face of the speaker during play, (2) Orienting towards the face of the speaker at the table, (3) Orienting towards an individual entering the room, and (4) Orienting toward the face of an individual speaking the participant's name. A "+" was recorded for correct responding and a "-" was recorded for incorrect responding. The results were converted into a percent of opportunity.

## DISCUSSION

The procedure proved to be an effective method of intervention for 2 out of 3 participants as demonstrated by improved accuracy in post probe trials from baseline. For the third participant, criterion was not met and the intervention was paused in order to condition voices as a reinforcer. This highlights the need to ensure that while implementing the stimulus-stimulus pairing procedure, the reinforcement to condition secondary reinforcers, are established reinforcer. Conducting reinforcer assessments prior to implementation of instruction could lead to more efficient outcomes.

Additionally, while no fidelity of implementation was collected, it is possible that the implementation of instruction for Participant C was not done with fidelity. Limitations of the study include a lack of intraobserver agreement or measures of fidelity of implementation, as well as a limited number of participants.

Further research should be conducted to measure the rate of learning (learn units to criterion) and emission of verbal operants (such as mands, tacts, sequels, and conversational units) following the conditioning of attending faces as a reinforcer, in order to replicate the findings of Maffei-Lewis, Singer- Dudek, & Dolleen-Day (2014) in which the participants' rate of learning accelerated and the frequency of verbal operates was increased following the stimulus-stimulus procedure.

## RESULTS

A non-concurrent, multiple baseline design across 3 participants with pre- and post- intervention probes was conducted.

Participant A scored an average of 65% accuracy on the pre-assessment. Criterion was met during instruction within 3 sessions, and he subsequently scored an average of 95% accuracy on the post-assessment.

Participant B scored an average of 33% accuracy on the pre- assessment. Criterion was met during instruction within 4 sessions, and he subsequently scored an average 55% accuracy on the post-assessment.

Participant C scored an average of 20% accuracy on the pre- assessment. Criterion was not met during instruction, and the intervention was ultimately paused. No post-probe was conducted.

### Participant Assessment and Instruction

