Verbal Operant Transfer with Mands and Tacts Using Multiple Exemplars

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Verbal Operant Transfer with Mands and Tacts Using Multiple Exemplars

by

Jessica Shea

A thesis submitted in partial fulfillment of the requirements for the degree of Master of Arts
Applied Behavior Analysis
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Keywords: behavior analysis, verbal behavior, requesting, labeling, edibles

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Table of Contents

List of Figures ii

Abstract iii

Introduction 1

Method 7
  Participants and Settings 7
  Target Behaviors 10
  Data Collection and Interobserver Agreement 10
    Preference Assessment 11
  Procedures and Design 12
    Baseline 12
    Tact Training 13
    Mand Training 13

Results 15

Discussion 21

List of References 26

Appendices 28
  Appendix A: Data Sheets 29
  Appendix B: Parent Questionnaire 32
  Appendix C: Teacher Questionnaire 33
List of Figures

Figure 1: Percentage of correct responses on tact and mand probes for Brittany during baseline, tact training, and mand training phases. 16

Figure 2: Percentage of correct responses on tact and mand probes for Tiffany during baseline, tact training, and mand training phases 18

Figure 3: Percentage of correct responses on tact and mand probes for Susie during baseline, tact training, and mand training phases 20
Abstract

Research on the functional independence of tacts and mands is mixed. The conditions under which tact training transfers to mands are unclear. The current study evaluated whether multiple exemplars of tact training followed by mand training would result in the independent transfer from tacts to mands. It was shown that all three participants started manding for the item independently during tact training after one sequence of tact training followed by mand training.
Introduction

Many parents whose children are diagnosed with a language delay or other developmental delays worry about their children ever being able to speak, or speak like their typical peers. Verbal behavior (language) is an important part of life. Being able to request food, express emotions, and request help when needed are a few examples of the importance of language. Another issue related to children not being able to spontaneously communicate is the higher prevalence of problem behavior (Willinger et al., 2003) of children with language delays and those with lower verbal repertoires than their peers. These are two important reasons to discuss how to increase verbal behavior of children with language delays.

Skinner (1957) defined seven verbal operants with differing functional properties that that we learn as humans. This functional approach to language included looking at the controlling variables to distinguish the verbal operants. Verbal behavior is today a large part of a behavior analyst’s work especially for those who work with children diagnosed with autism or other developmental disabilities and who are providing early intervention services; as it has been proven to be an empirically validated method for increasing language skills of children diagnosed with autism (Lovaas, 1987; McEachin, Smith, & Lovaas, 1993).

Two of the verbal operants that Skinner defined were the mand and tact. A tact is evoked by a nonverbal stimulus, such as an object or event, or the relation between objects or events, and is maintained by generalized or social reinforcers (Skinner, 1957).
In everyday language the tact is equivalent to naming. In many cases, a tact is emitted when a verbal stimulus of “What is it?” is presented. For instance if an adult was holding up a banana and said “What is it?” the child would say “banana” and, the adult would say “Yes, you’re right!”. A mand is a response that is reinforced by a characteristic consequence and is under the functional control of relevant conditions of deprivation or aversive stimulation (aka, an establishing operation). In everyday language, the mand is equivalent to asking for something. These responses can be defined as under the control of establishing operations (Michael, 1988). Using the example of the banana, a child could emit a mand (request a banana) when he/she was hungry or even after an adult said “What do you want to eat?” and would receive the banana as the reinforcing consequence. As part of Skinner’s functional analysis of verbal events he suggested that each verbal operant was functionally independent of the others. So if a child learned to tact a banana, he could not spontaneously then mand for a banana when hungry, even though the response form was exactly the same. The question of functional independence is important when teaching children language; do we need to teach both the tact and mand separately, or can we teach only one and expect an independent transfer of the skill between the two? Researchers have investigated whether Skinner was correct in his theory that the verbal operants are functionally independent and do not necessarily transfer without formal teaching of each (e.g., Drash, High, & Tudor, 1999; Lamarre & Holland, 1985; Wallace, Iwata, & Hanley, 2006).

Lamarre and Holland (1985) worked with ages 3 to 5 year olds, to determine if they taught them to mand where to put an item (i.e., on the left or on the right) or to state where the item was (i.e., on the left or on the right) whether a transfer would be seen.
The participants were split in half and one group was taught to mand first and the other was taught to tact first. For neither group was transfer seen between the verbal operants nor did the results show that establishing a repertoire for one verbal operant would result in the development of another without training. Hall and Sunberg (1987), working with two deaf teenagers who had extensive tact repertoires but very low manding behaviors, investigated whether participants would mand for items they needed to complete a behavior chain once they were able to tact the item. Although participants tacted the items, they did not emit mands for the missing item in the behavior chain. Therefore, the authors came to the conclusion that mands and tacts were functionally independent. These studies showed that mands and tacts are acquired separately as Skinner (1957) had stated.

Sigafoos, Doss, and Reichle (1989) examined whether adults with severe disabilities would transfer their training of tacts to request food items and the utensil required to eat or drink that item. A conditioned establishing operation was used by withholding the item from the participants until they manded for the utensil required to eat or drink the preferred object. The results showed that the transfer between tacts and mands was limited; some mands occurred with no direct intervention after only tact training. The occurrence of some tact to mand transfer provided some support for the contention that verbal operants might not always be independent and that one of the verbal operants could be acquired without direct training.

Although the previous studies for the most part did not show transfer from tacts and mands, the research topic continued to be examined when Sigafoos, Reichle, Doss, Hall, and Pettitt (1990) completed another study to determine whether participants would
exhibit a mand after being taught a tact. The results showed that for both adult
participants, two of the three mands were exhibited with no prior training after the tact
intervention. In another study Twyman (1996) showed that with two of the four
preschool participants, independent transfer was not seen until after some training with
both mands and tacts. Drash et al. (1999) taught children with language delays to mand
for items by manipulating the EOs for the specific reinforcers. After teaching the mands,
all three of the participants rapidly acquired echoic repertoires and two expanded their
tact repertoire as well.

Wallace et al. (2006) conducted research with adults with mental retardation who
had no tacts or mands for desired items. Before conducting the mand or tact training,
they conducted a preference assessment to determine food items that were highly
preferred and those that had a low preference for each participant. After the food items
were taught as tacts the establishment of mands for the high preferred responses occurred
with no prior training. However, the items were in sight when manding occurred so some
stimulus control of the nonverbal stimulus might have been present. Gilliam, Weil, and
Miltenberger (in press) evaluated this premise by again testing whether tacts for highly
preferred items would transfer to mands. These results were similar to those of Wallace
et al. (2006) in that the transfer occurred with only high preferred items and not with low
preferred items. Troconis and Miltenberger (2011) further evaluated the effect of using
highly preferred edibles on the independent transfer from tact to mand with three children
diagnosed with autism spectrum disorder. They taught the children to tact the necessary
utensils to eat a preferred edible to see if independent mand transfer could be shown once
the preferred edible was available, but not the utensil needed to consume the food item.
The results showed that the independent transfer from tact to mand did not occur with two of the three participants. However, once a mand response was taught and mastered, each participant exhibited the mand response when the conditioned establishing operation was in effect, but not when it was absent.

Because there is no conclusive answer about the conditions under which tacts and mands are functionally independent or the conditions under which training one leads to the other, we need to continue to develop research on this topic. Some research shows that, after teaching tacting, some independent mands occur especially after mand training has also occurred (Troconis & Miltenberger, 2011). Both Sigafoos et al. (1990) and Twyman (1996) showed that if a mand repertoire already existed or participants received some training in both operants, transfer could be seen for some objects/individuals. If transfer can be seen after some training in both operants, how much training is necessary? For instance if a child with language delays was taught to tact an object, and then taught to mand for that same object, would there be a independent transfer after a second item was taught as a tact, or possibly a third? There is no research to show how many sessions of tact training followed by mand training need to occur before transfer from tacts to mands occurs. Stokes and Baer (1977) indicated that one strategy for promoting generalization involved training multiple exemplars. They found that to increase the likelihood that a skill would generalize; it needed to be trained with multiple exemplars (more than two). Once the response was reinforced in the presence of two or more exemplars, generalization of that skill occurred to additional non trained stimuli.

Building on the concept of multiple exemplar training discussed by Stokes and Baer, this study investigated multiple exemplar training, in which the tact and the mand for the
same item were trained in sequence, to determine how many exemplars were needed for
tact training to result in the execution of mands prior to mand training.
Method

Participants and Setting

Three children, ages 3 and 4, who were enrolled in the Early Exceptional Learning Program (EELP), were recruited from a local public elementary school in a suburb of a metropolitan city. For children to be enrolled in this program they must show some delay in at least two areas (speech, language, cognitive, social, adaptive, etc) or a severe delay in one. Although the children were tested for delays, they were not given diagnoses. The principal investigator (PI) spoke with the two EELP teachers in the school to recruit participants that fit into the study inclusion criteria. As part of the inclusion criteria, all students had vocal behavior, had low tact and mand repertoires, and spoke primarily English. A recruitment flyer was sent home to the parents to see if they were interested in their child participating in the study. A meeting was set up with the parents to receive their consent and inform them of the details of the study. Children were selected based on their verbal repertoires; participants had a limited one to two word mand and tact repertoire, per parent and teacher report. The first two participants (Brittany and Tiffany) were in the same EELP classroom, and the third (Susie) was in a second classroom. Mand and tact probes (described later) were used to determine whether participants had the verbal deficits required for inclusion. During the parent meeting, the PI completed a preference questionnaire with the parents to establish possible reinforcing food and drink items of each student. A paired choice preference assessment was completed with each student prior to baseline beginning.
The local public elementary school was a PreK through 5th grade school offering both typical and exceptional student education classrooms. Included in the exceptional student education (ESE) were classrooms for Language or Speech Impairment, Specific Learning Disabilities, Limited Intellectual Functioning, Orthopedic Impairments, Multiple Disabilities, and Other Health Impairments. The school was a Title 1 School with 77% of the students receiving free or reduced lunch- 19% of the students are considered having disabilities. The school was a PBS model school for the county and therefore the behavior of the students is tied very closely to their school expectations (always responsible, safety first, etc.).

Brittany was a 4 year old girl who was enrolled in the EELP program for speech and language delays, primarily in the receptive language domain. It also was documented that she had deficits in the fields of cognitive and social emotional abilities. It is worth noting these delays and deficits came from testing and reports that were completed prior to the students being enrolled in the EELP program, for Brittany the report is at least a year and a half old. Her mother reported that she did not ask for food or drink items on her own and that it was very frustrating for her family when she would not tell them what she wanted. Brittany did not exhibit any problem behaviors at home or at school. Teachers reported that she followed directions well, but again did not express herself by using words. She pointed to communicate her needs. The only food item that the teacher said she requested at school independently was juice. Her mother also informed us of the same information. Both parent and teacher reported that she was not particular with food and would eat almost anything, but found sweet items highly reinforcing.
Tiffany was a 3 year old girl who was receiving services in the EELP program for the first year due to speech and language delays, primarily for expressive language skills. Tiffany’s report was completed approximately a year ago. Her teacher reported that she communicated her needs by pointing or engaging in echoic behavior, and that she did not verbally request her wants and needs. Both parent and teacher stated she could request juice and milk independently, but that was the extent of her manding repertoire. It was also reported that she ate all foods but loved fruits and sweets. Her teacher reported that she labeled many items in the classroom, and she did not engage in any problem behaviors at home or at school.

Susie was a 4 year old girl enrolled in the EELP program due to delayed receptive and expressive language skills. This delay was determined from testing done at least a year ago. Her teacher reported that she had words but did not use them on a regular basis. She pointed and grunted to communicate her wants and needs to others. When she was asked to use her words it took two to five prompts for her to do so. Her teacher reported that she had a limited manding repertoire and that she could label many foods but did not do so. Parents reported the same thing. Her mother reported that because Susie became frustrated when she asked Susie to use her words, she often withdrew the demand, and Susie did not have to mand or tact items. The teacher and her parents also informed the PI that she could be stubborn if things did not go her way.

The sessions were conducted at a table in a pullout room near the classroom. Typical school surroundings were found in the area, tables, chairs and educational materials. A video camera was placed nearby prior to beginning the session. One to three sessions were conducted daily, a minimum of three times per week. Sessions were
conducted prior to breakfast, lunch, or snack time to increase the EO to mand for edible items.

**Target Behaviors**

The target behaviors assessed in this study were tacts and mands of food and drink items.

A tact was defined as a vocal response after a discriminative stimulus given by the PI consisting of “What is it?” in the presence of the actual item (banana, pudding, water, juice). A response was scored as correct when the student emitted a one word vocal response within 5s that matched the item shown. A generalized reinforcer, consisting of praise and a high five or thumbs up, was delivered immediately upon a correct response. An incorrect response was defined as the student emitting a vocal response that did not match the item shown or no response within 5s. If the vocal response was incorrect or no response was given, no consequence was provided.

A mand was defined as the student emitting a vocal response for a preferred food or drink item. The item was not visible at that time. To conduct mand probes the student was given a taste of the item, then the item was placed out of sight until the student requested it. A correct response was counted if the child requested the item within 10s when the item was not visible. If the correct response was emitted, the student received the item and was praised for asking for the item. If the student did not engage in the correct vocal response, no consequence was provided.

**Data Collection and Interobserver Agreement**

Each assessment session consisted of three to five tact probes and two to five mand probes for each item. The PI conduct all sessions for this study. Data were collected per trial for the student’s vocal responses for the tact and mand probes on data
sheets made for this study (see appendix A). Responses were recorded as correct or incorrect at the time of the individual probes. Videotaped sessions were observed at the end of data collection to calculate interobserver agreement (IOA).

One half of the sessions were videotaped and observed by a second observer for calculating IOA. IOA was calculated on a trial by trial basis using exact agreement (agreements divided by agreements plus disagreements multiplied by 100). An Applied Behavior Analysis masters student was trained on the target behavior definitions of both mands and tacts to collect IOA data. Sample videos were shown prior to the start of the study to practice recording both incorrect and correct responses of the students. IOA was calculated at 97.3% for the study.

**Preference Assessment.** The participant’s parent and teachers were interviewed and asked to complete a preference questionnaire (see appendix B). The parents were asked what their child enjoyed eating and drinking; but could not request using the correct word. These items were presented in a paired stimulus assessment in a random order, as Fisher et al. (1992) described. Two items were placed on a table in front of the student, and data were collected to determine which item the student approached. These data were collected on a trial by trial basis, and the percentage of items approached was calculated. The items were paired with one another five times during the assessment. If the student tried to approach both simultaneously, the researcher blocked the attempt. The five items with the highest percentage of approaches were selected for the study as the preferred edible items (food or drink) for each child. Five items were selected for each student in case the student independently mandated for or tacted for an item during baseline probes.
Procedures and Design

A multiple baseline design across behaviors was completed for the study. Each student participated in a baseline phase for one item, followed by a tact training phase and a mand training phase if needed. This sequence of phases was repeated across three items with tact training beginning for the second item after tactics and mands were learned for the first item and tact training for the third item beginning after tactics and mands were learned for the second item. After each session for all phases, the students received a generalized reinforcer from the experimenter for participating in the session for that day.

The language development that we were targeting for this study was consistent with the classroom instruction and the curriculum the students were already receiving in the EELP program. Many of the goals for the curriculum were to increase social behavior with peers, follow set schedules and adapt to transitions, and increase language. The goal was to prepare them to enter a typical Kindergarten classes the following year to two years unless they were reassigned (additional testing had to be completed).

Baseline. During baseline sessions, three to five tact probes and two to three mand probes were conducted for each item. During the baseline, the PI tested to see that the item was not already in the student’s tact and mand repertoire. If the participant emitted any tacts or mands for the item, another item was selected instead. Susie did not emit tacts or mands for her second item (pudding) during four baseline probes, but did tact the item correctly in a number of trials in the fifth baseline session and 100% during the sixth baseline session. The PI then continued to provide praise for the correct tact to see if tacting would increase and to assess transfer to mands without mand training.
**Tact training.** The tact training phase began after the baseline phase for each item, and consisted of the child being prompted to label the specific item after a discriminative stimulus of “What is it?” from the PI. The sessions consisted of at most 10 training trials, with most to least prompting used for the child to vocally respond with the corresponding name of the item. Most to least prompting began with providing the child a prompt of the items name, and fading to least prompting consisting of just giving the first letter sound of the item. For correct responses the student received praise (“Great Job! It is a banana!”) and sometimes a high five from the PI. As more independent answers were emitted by the children, more praise was given at a higher level, using differential reinforcement. As part of the session, known maintenance skills such as gross imitation, touch body parts, and vocal imitation were interspersed with the teaching trials. During the tact teaching trials, prompting level was faded as the session continued. If the student did not respond or responded incorrectly, the trial was restarted after behavior momentum (using already known items to promote correct responding from the student) was used to reintroduce the trial. The student’s vocal responding was only marked as correct when she responded correctly without prompting. The tact was considered mastered when the student responded correctly with no prompting three sessions in a row at 100%.

**Mand training.** Following the tact training phase, if mands were not occurring during mand probes, the PI began training the student to mand for the specific item by having the student taste the item, then placing the item out of sight. If the student manded for the item, the PI gave the item to the student, the student took a bite, and then the PI removed the item from sight. The sessions consisted of a maximum of 10 training
trials, with most to least prompting used for the child to vocally respond with the corresponding name of the item. If the child engaged in the appropriate mand independently three times in a row, the training was stopped before the maximum 10 trials. Most to least prompting began with providing the child a prompt of the item’s name, and fading to the child being given part of name, then the first letter sound of the item, and then just a point at the PI’s mouth (a prompt to use her words). For correct responses the student received the item and praise. As in tact training, known maintenance skills were interspersed with the teaching trials. If the student did not respond or responded incorrectly, the trial was restarted after behavior momentum was used to reintroduce the trial. The student’s vocal response was only marked as correct when she responded correctly without prompting. The training sessions were considered mastered when the student responded correctly with no prompting three sessions in a row at 100%.
Results

Figure 1 shows tact and mand probes for Brittany during baseline, tact training, and mand training. Three items were selected for the intervention based on her preference assessment results: yogurt, fruit, and pudding. During baseline for all three items Brittany did not emit mands or tacts for any of the items. The first training she received was tact training for yogurt. She learned this skill fairly quickly, and was emitting it at 100% after two sessions. Although she learned to tact the item she did not mand for the item independently during probes. After three sessions at 100% independent tact responding, she received the mand training intervention and emitted mands for the item after two sessions. After mand training for yogurt, she received tact training for fruit. She had more difficulty with this word, and showed a higher level of variability, however, after three sessions when she tacted at 100% she also manded at 100% for the item. No mand training was needed as she was emitting it independently at levels of 100% at the end of the tact intervention. Tact training for pudding began after tacts and mands occurred for the fruit cup, and she immediately manded for the item at 100% independence with no mand training. Tacts occurred at 100% following 5 tact training sessions.
Figure 1. Percentage of correct responses on tact and mand probes for Brittany during baseline, tact training, and mand training phases.
Figure 2 shows mand and tact probes during baseline, tact training, and mand training phases for Tiffany. Upon tact training for fruit snacks, Tiffany acquired this skill quickly. After three sessions she was tacting at 100% independence, but was not emitting mands. After six sessions of mand training, she independently manded for fruit snacks at 100%. Next we began tact training for goldfish, and upon learning to tact for the goldfish, Tiffany manded for the item with no direct training after one session. When Tiffany received tact training for pudding, she tacted pudding with variability for four sessions, then had 100% independence for three sessions. Manding then occurred at 100% without any direct training once her tacting response was stable.
Figure 2. Percentage of correct responding during tact and mand probes for Tiffany during baseline, tact training, and mand training phases.
Figure 3 shows tact and mand probes for Susie during baseline, tact training, and mand training. During the baseline probes for goldfish, she did not tact or mand for the item. Following tact training for goldfish, tacts emerged immediately and reached 100% after four sessions. However mands did not emerge until mand training. She reached 100% for mands after four training sessions. During baseline for pudding, no mands or tacts occurred during the first four sessions. However tacts began occurring in the fifth session and continued to occur as they were reinforced with praise. Once tacts occurred consistently, manding also occurred and the phase ended with mands and tacts occurring at 100% for four sessions. Following a baseline with no tacts or mands for milk, Susie received tact training for milk. Tacting occurred and remained at 75% while mands emerged in the second session without direct training. In all four sessions of tact training she got the first trial incorrect, received corrective feedback, and then got the last three trials correct independently. Due to the end of the school year, the study was ended before Susie reached the criterion of three days at 100%.
Figure 3. Percentage of correct responding during tact and mand probes for Susie during baseline, tact training, and mand training phases.
Discussion

The purpose of this study was to investigate the transfer from tacts to mands following a history of tact training followed by mand training and to determine how many exemplars of tact and mand training were needed until mands emerged following tact training. Previous literature is mixed on transfer from tacts to mands without direct teaching. We had hypothesized that after the second exemplar of tact training followed by mand training, the third item would emerge as a mand during tact training with no direct mand training. However, with all three participants in this study, one exemplar of tact training followed by mand training resulted in transfer from tact to mand with the two subsequent items. In everyday language, we taught the participants to label an item, and then ask for that same item, and one exemplar of this training was all the training they needed to request the next two items once they learned to label those items as well. This finding showed us that the transfer happened quicker than we had originally thought it would.

No previous research has documented how many exemplars of training were needed for transfer to occur. However, some previous research has followed up on Skinner’s theory that the verbal operants were functionally independent and showed that transfer did not necessarily happen without formal teaching of each verbal operant (Drash et al., 1999; Lamarre & Holland, 1985; Wallace et al., 2006). However, others have shown some transfer from tacts to mands, such as Sigafoos et al. (1990) who found that their adult participants exhibited mands after tact training. Twyman (1996) found that
after training preschoolers on mands and tacts, transfer was seen. This study did not determine how many training exemplars were needed for the transfer to occur, only that it would occur at some point after both verbal operants are trained. The current study shows that the number of exemplars could be as few as one before transfer occurred from tact to mand.

It is possible that different results might be seen with children with other disabilities. This study only worked with three students who were diagnosed with some type of language delay. Most studies of verbal operant transfer have been conducted with children and adults with autism or other developmental disabilities (Hall & Sunberg, 1987; Troconis & Miltenberger, 2011; Wallace et al., 2006). The study should be replicated to confirm the findings, and this could be done both with children with language delays (as in this study) or children diagnosed with another developmental delay such as autism spectrum disorder. Future research could also look into whether the skills would generalize if another person conducted the probes, such as a teacher or parent. Another interesting topic would be to see if multiple exemplar training resulted in transfer from tacts to mands with less preferred items. Another study could see if the same results occurred with preferred activities instead of preferred edibles as in this study. In addition, the gains in this study were seen quickly and clearly with the one on one training, so it would be worthwhile to investigate teacher training in the use of the same protocols. It is possible that teachers could see quick and clear gains as well if they used the same protocols.

The teachers in this study reported an increase in language usage for all three participants. Brittany and Tiffany’s teachers mentioned that following the study, they
requested food items that they had not been directly taught to ask for and had not requested the entire year. The PI also noticed that the participants’ language skills were increasing during the walk to and from the pullout room. When the students began the study they were not talking during the walk, however, by the end of the study the participants were using appropriate voice level and were having conversations about what they had eaten earlier in the day or what they did the night before. This increase in verbal behavior could be due to the specific tact and mand training in the study or to participating in the study generally and feeling more comfortable with the PI who reinforced tacting and manding in the course of the study. It is interesting that the teachers also noted the increase in language and thought it was due to the study.

A social validity questionnaire was given to both teachers in order to collect their feedback on the study. All questions were answered on a rating scale from 1 (strongly disagree) to 5 (strongly agree). Both teachers strongly agreed that the intervention was beneficial to their students and that they would be willing to have other children in their classroom participate in the study in the future. When asked if they saw an improvement in their students’ language skills after training they both answered strongly agree. For level of improvement the scale was 1 (never) to 5 (all the time). Brittany’s teacher reported that before the study she used her words without prompting at a level of 1; but afterwards rated her as using her words at a level 5. She also reported that Tiffany used her words at a 2 prior to the study but at a 5 after intervention. Susie’s teacher reported that she used her words at a 3 prior to intervention and at a 4 after intervention. Brittany and Tiffany’s teacher reported that she strongly agreed that the students enjoyed taking part in the training sessions. Susie’s teacher reported that she agreed. These positive
comments and ratings from the teachers are valuable because ABA is not always well received in the school system and other settings. Because the teachers in this study valued the intervention and thought highly of the results, their opinions of ABA generally may be increased.

There were several limitations to the study, mostly around the setting in which the study took place. In order to have an EO for the students to “want to” mand for the food, we conducted the mand probes prior to breakfast, snack, and lunch. However, due to the school schedule sometimes these time frames were only an hour apart from each other. This timing of probes could have decreased the students’ EO for food or drink items. Susie arrived late and left early from school each day so she had an even smaller window of time between sessions. Another limitation was that the setting was not as controlled as desired. For instance we could not prevent the students from hearing the items named or from eating the items in other settings, especially in a cafeteria setting with an entire classroom. In addition, the parents brought the children to preschool on an unpredictable basis so there were many days where the participants did not attend and were not available for the study. Susie especially missed a substantial number of days, so her time in the study was erratic and the time to finish took much longer than for Brittany or Tiffany. Prior to beginning the study the teacher reported that “Susie had words; she just did not use them.” This fact became evident while working with her; she often did not follow directions to do simple motor or verbal imitations which resulted in substantial prompting at times.

For Brittany and Tiffany, it was reported that they ate anything placed in front of them and loved all foods. This was shown throughout the study as they never refused or
said “all done” when a taste of an item was offered as a taste. These two participants also showed transfer much quicker than Susie. Even though we choose foods that were highly preferred in the preference assessment, Susie was much choosier when the PI offered the taste of the food during the mand probes. Multiple times throughout the study she said “no” or “all done” when the food was offered and the PI could not perform a mand probe.

To summarize, this study showed that, following one exemplar of tact training followed by mand training for a highly preferred edible, three preschool age girls with language delays manded for the two subsequent edibles after only learning how to tact each item appropriately. Although future research should provide direct and systematic replications to demonstrate the robustness of this finding, this study demonstrates a strategy for promoting transfer from one verbal operant (tact) to another (mand) without direct training.
List of References


Appendices
Appendix A: Data Sheets

Participant: _______ Date: _____ Observer: _____ Time: _______
Target Item: ____________________________

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### Appendix A: Data Sheets

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## Appendix A: Data Sheets

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Appendix B: Parent Questionnaire

Participants Name: _____________________________________________________________

Does the student independently vocally request food and drink items he/she would like?
__________________________________________________________

If not, how do they communicate their needs? _________________________________

What food or drink items does he request independently? _______________________
__________________________________________________________

What are some items he/she does **not** request independently?_______________

What are some food/drink items your child really enjoys?_________________________
__________________________________________________________

What is the student's requesting (manding) repertoire like?_____________________
__________________________________________________________

What is the student's labeling (tacting) repertoire like? _______________________
__________________________________________________________

Does the student engage in any problem behaviors the researcher should be aware of?
__________________________________________________________

Any additional comments on your child for the researcher: _______________________
__________________________________________________________
Appendix C: Teacher Questionnaire

Participants Name: _____________________________________________________________

Why do you think this student will be a good fit for this study?
___________________________________________________________________________
___________________________________________________________________________

Does the student independently vocally request food and drink items he/she would like?
___________________________________________________________________________

If not, how do they communicate their needs? ________________________________

What food or drink items does he request independently? ______________________

What are some items he does not request independently? ______________________

What do you feel are reinforcing food or drink items for this student? ____________
___________________________________________________________________________

What is the student's requesting (manding) repertoire like? _____________________
___________________________________________________________________________

What is the student's labeling (tacting) repertoire like? _________________________
___________________________________________________________________________

Does the student engage in any problem behaviors the researcher should be aware of?
___________________________________________________________________________

Any additional comments on this participant for the researcher: _________________
___________________________________________________________________________