FURTHER REFINEMENTS AND APPLICATIONS OF

SAY-DO CORRESPONDENCE TRAINING

by

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(Under the Direction of Scott Ardoin)

ABSTRACT

Say-do correspondence describes a chain of events in which an individual says they will do something and follows through with what they said they would do. This two-part dissertation (a) systematically reviews the larger omnibus, correspondence training, and (b) evaluates the efficacy of say-do correspondence to address mealtime behavior problems—a novel application of this procedure. In Chapter 2, a review of the correspondence training literature employing single case experimental design methodology revealed that say-do correspondence represents an overwhelming majority of the existing correspondence training literature, but lacks quality and rigor characteristics, including measures of procedural integrity and social validity, and sufficiency of data to confidently measure the presence of an effect. In the study presented in Chapter 3, we observed substantial increases in independent eating for a child using say-do correspondence training with one group of foods and moderate increases in the other two groups of foods.

INDEX WORDS: correspondence training, say-do correspondence, verbal behavior, pediatric feeding disorder, ARFID, food consumption

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CHAPTER 1

CORRESPONDENCE TRAINING TO ADDRESS FEEDING PROBLEMS

Correspondence describes the matched relationship that verbal behavior shares with other verbal or nonverbal behavior. Two forms of correspondence can occur—when an individual reports some past behavior (i.e., do-say) and when they follow through on a promise (i.e., say-do; Baer, 1990; Israel & O'Leary, 1973). Society labels individuals as truthful or dependable when they engage in correspondence and the chain of responses are commonly associated with character traits such as honesty, integrity, and morality. If correspondence does not occur (i.e., an individual says they will do something and does not follow through or says they did something that they did not do), society may slander these individuals with labels, such as liar or untrustworthy, and reduce their interaction with those who demonstrate noncorrespondence. Behavior analysts have conceptualized lying as a form of noncorrespondence and used correspondence training to increase accurate reporting (Sauter et al., 2020; Stocco et al., 2021).

Caregivers and teachers consistently rank lying as a serious problematic behavior for children and such behavior can lead to difficulties among peer and parent-child relationships, and behavioral and emotional problems (Engels et al., 2006; Stouthamer-Loeber, 1986). The topic of lying spans across religions and cultures and dominates philosophical and ethical debates. In a discussion about lies, Immanuel Kant wrote “For it always injures another; if not another individual, yet mankind generally, since it vitiates the source of justice” (Kant, 1889, p. 362). Lying and deceit describe behavior that are continuously pervasive and problematic within society, suggesting a key area of research for the field of behavior analysis.

Researchers conducing correspondence research noted that after teaching correspondence, participants were observed to engage in generalized correspondence (i.e., correspondence that occurred outside of the training context), suggesting the promise or say response provided an added benefit of generality compared to targeting a single nonverbal response using reinforcement alone (Israel & Brown, 1977; Risley & Hart, 1968; Williams & Stokes, 1983). Correspondence may serve as a behavioral cusp (Rosales-Ruiz & Baer, 1997) and possess developmental implications beyond the verbal-nonverbal relationship. Correspondence also shares commonalities with strategies used for planning and organizing, as well as overlapping cognitive constructs, such as self-regulation, metacognition, and executive functioning (e.g., Najdowski, 2017; Richie, 2005). Correspondence training procedures have important implications for dissemination outside of the field of behavior analysis to other disciplines including cognitive psychology, developmental psychology, educational psychology, and school psychology.

Risley and Hart (1968) first evaluated correspondence training for teaching preschool children to accurately say with what toys they had previously played with. Although researchers used a doing-then-saying arrangement, later researchers expressed interest in studying the reverse arrangement (i.e., saying-then-doing) due to similar structural relations to promise-keeping and self-instruction (e.g., Deacon & Konarski, 1987; Guevremont et al., 1986; Williams & Stokes, 1983). Growth in correspondence training research led to procedural refinements and renaming the procedure first described by Risley and Hart to reinforcement of do-say correspondence (Israel & O'Leary, 1973; Paniagua, 1990). Since its inception, researchers became interested in the generality of correspondence to novel and untrained contexts and transferring stimulus control of promised behavior from the individual delivering the reinforcer

to the promise itself (Baer, 1990; Lloyd, 2002). Researchers proposed that correspondence could maintain in contexts when monitoring behavior may be inconvenient or challenging, such as across settings or with different social partners who are unaware of the contingencies in place (Israel, 1978).

Proposed Mechanisms in Correspondence Training

Researchers continue to provide new perspectives on the formation of and underlying behavioral mechanisms in verbal-nonverbal relations. Rogers-Warren and Baer (1976) first suggested that the reinforcement contingency is the underlying mechanism in correspondence training (e.g., Sidman, 2000). Although this may be the most parsimonious answer, some researchers countered that contingency-shaped behavior may not account for generalized correspondence and that rule-governed behavior may better explain this phenomenon (Deacon & Konarski, 1987; Ward & Stare, 1990). Rule-governed behavior depends on descriptions of the contingencies in place, or contingency specifying stimuli (Blakely & Schlinger, 1987). Past studies on correspondence suggest both the use of rules and performance feedback (which may function as a rule for the next correspondence opportunity), could be related to the generality and maintenance of correspondence (e.g., Deacon & Konarski, 1987; Osnes & Adelinis, 2005; Williams & Stokes, 1983).

The presence of generalized correspondence led researchers to conceptualize the vocalization in say-do correspondence as an individual engaging in *self-instruction* (Duarte & Baer, 1994). Fundamental to teaching self-instruction is conditional stimulus control (Grote et al., 1996). Conceptually, say-do correspondence may also be an instance of conditional stimulus control (Cumming & Berryman, 1961; Lattal & Doepke, 2001; Mawhinney, 1993). In a say-do arrangement, conditional discrimination may be established as the presence of both the delivery

of reinforcers and the vocalization may establish control under multiple stimuli (i.e., the behavior-change agent and the vocalization). Self-instruction can enhance discrimination, evoke behavior that corresponds with the associated contingencies, and transfer control of the discriminative stimulus away from the person delivering reinforcement (Duarte & Baer, 1994). Students who engage in self-instruction demonstrate increased attention to and independence with tasks (Burgio et al., 1980; Guevremont et al., 1988). Self-instruction forms a chained schedule (i.e., the opportunity to complete the next step serves as reinforcement for the prior step until the terminal reinforcement criteria is met), which may involve choosing to engage in say-do correspondence because the relative rate of reinforcement for doing so is higher than reinforcement for not doing so (da Silva & Lattal, 2010; Mace et al., 2001). For example, past researchers established control using a correspondence rule (i.e., "You have to do what you say you will do", p. 26) to increase the saliency of the target response and observed high levels of say-do correspondence after programming a chain of responses, like self-instruction, in which the participant emitted the correct vocalization followed by the correspondence rule and the corresponding nonverbal play behavior (Williams & Stokes, 1983). Say-do correspondence and self-instruction, despite topographical differences, may be functionally related if they produce similar outcomes.

Researchers have also proposed that "doing" is part of a generalized relational repertoire that is contextually controlled by the act of "saying" and that generalized correspondence is an example of abstract relational responding (Hernández-López et al., 2011; Luciano et al., 2002; Luciano et al., 2001). Relational Frame Theory describes how language may be learned via relational stimulus control or stimulus equivalence (Hayes et al., 1996). From the stimulus equivalence perspective, an individual could teach the relationship between saying and doing

using one example and expect that the learner applies it to a different scenario, even if the topography of what was said and done does not match the initial example with which the relationship was taught. Generalization may occur because verbal behavior (i.e., saying) possesses contextual cues that serve as discriminative stimuli that evoke relational responding that is functionally related (i.e., doing). According to Relational Frame Theory, reinforcing bidirectional responding (e.g., say-do and do-say sequences) could also result in generalized correspondence and may explain why researchers observed the emergence of both sequences of verbal-nonverbal relations (i.e., say-do and do-say sequence) after only targeting one sequence in training (Israel & O'Leary, 1973; Karoly & Dirks, 1977; Wilson et al., 1992).

Say-do Correspondence and Compliance

Saying is the defining difference between say-do correspondence training and compliance training. Unlike say-do correspondence, compliance requires that an individual's behavior match some instruction from an external source, rather than the verbal behavior of the individual themselves. Although topographically different (i.e., saying X versus not saying X), say-do correspondence and compliance possess common features in a contingency space analysis, which examines the conditional probabilities of response-stimulus relations (Baer et al., 1988; Matthews et al., 1987). Baer et al. (1988) used a reversal design embedded within a multiple-baseline across toy play to compare the toy play behavior of preschool-aged children during baseline, say-do correspondence training, and compliance training conditions. The contingency-space indicated comparable positive contingency values for both conditions, suggesting equal probability of the targeted toy play when participants reported what toy they planned to play with (i.e., say-do correspondence) and when the experimenter instructed the participant to play with the target toy (i.e., compliance). A second experiment included a third condition in the

comparison that omitted any vocal antecedent (i.e., instruction on behalf of the participant or an external source); experimenters observed lower levels of target toy play across subjects in the third condition. Baer et al. concluded that some form of vocal antecedent may be necessary to promote high levels of target responding, regardless of the procedure in place.

Multiple researchers systematically replicated the methods comparing say-do correspondence and compliance and discovered similar findings (Deacon & Konarski, 1987; Ward & Stare, 1990; Weninger & Baer, 1990). These studies suggest the child's vocalization in say-do correspondence training and the therapist's instruction in compliance training may exert similar control over the future probability of a response. Ward and Stare (1990) noted additional benefits to say-do correspondence training, including generalization and maintenance. Specifically, Ward and Stare observed increased targeted play for all six children in the correspondence group and only five out of six in the compliance group. When assessing for maintenance, researchers discontinued reinforcement contingent on either say-do correspondence or compliance and instead delivered reinforcement contingent on vocal statements about engaging in targeted play. They observed maintenance above baseline levels for five out of six participants, (continued maintenance for three participants and two for whom responding eventually extinguished) in the correspondence group and only one of six participants in the compliance group. Researchers also observed generalized correspondence with an untargeted but low preferred toy for five of six students who received correspondence training, compared to two of six students receiving compliance training. The results are limited to one study with a small sample but provide a rationale of efficacy for one procedure over another.

Implications for Feeding and Health-related Behavior

Correspondence training involves the use of intraverbals to evoke the vocalization and delivering reinforcement contingent on correspondence. An intraverbal response occurs if the response does not match the verbal behavior that evoked it (i.e., no point-to-point correspondence; Skinner, 1957). A patient's intraverbal response to a doctor asking, "Are you going to discontinue using cigarettes?", may be "Yes, I am going to quit smoking." In say-do correspondence training, the patient's intraverbal response then becomes the vocalization and reinforcement becomes contingent on the patient ceasing to smoke cigarettes. However, reinforcement is contingent on correspondence rather than nonverbal behavior alone. Say-do correspondence training may be especially valuable when individuals are tasked with changing behavior in inaccessible settings, such as within healthcare or the community. Healthcare professionals could facilitate correspondence outside of the clinic setting if the individual's nonverbal behavior in the community were to come under the control of verbal behavior in the clinic (Israel, 1978).

Past researchers used correspondence training to address a myriad of health-related behavior, including posture (Luciano-Soriano et al., 2000; Noda & Tanaka-Matsumi, 2009; Whitman et al., 1982), exercise (Wilson et al., 1992), and sleep and safety (Paniagua, 1985). Three studies (i.e., Baer et al., 1987; Baer et al., 1983; Friedman et al., 1990) targeted dietary habits by implementing say-do correspondence to increase consumption of healthy snacks in school for 13 children between the ages of 4 and 9 years. Prior to say-do correspondence training, participants across studies intermittently or rarely selected the nutritious snack (e.g., fruit, vegetable) when given a choice between nutritive or nonnutritive food (e.g., cracker, cookie). Following say-do correspondence training (Baer et al., 1987; Baer et al., 1983) or

nutritional education preceding say-do correspondence training (Friedman et al., 1990), all participants demonstrated an increase in healthy snack selections. Say-do correspondence may be useful for improving health outcomes and changing poor eating habits associated with selectivity. However, no studies that we are aware of, to date, have evaluated its efficacy with improving mealtime behavior for children who are severely selective in their eating (i.e., elimination of one or more food groups resulting in nutritional deficiencies).

Purpose

The first study of this dissertation (Chapter 2) extends prior research on correspondence training by systematically reviewing the existing literature with attention to identifying high-quality research. We assessed the quality of measurement and rigor of single case research that evaluated the efficacy of multiple procedural variations of correspondence training. The second study of this dissertation (Chapter 3) explored a novel application of say-do correspondence training examining the efficacy of say-do correspondence training to increase independence during mealtimes for a child with avoidant/restrictive food intake disorder and autism spectrum disorder. In addition to this, we assessed caregiver social validity of correspondence training compared to more traditional applications of differential reinforcement.

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CHAPTER 2

BEHAVIORALLY DEFINING TRUTHFULNESS AND DEPENDABILITY: A SYSTEMATIC REVIEW OF CORRESPONDENCE TRAINING PROCEDURES [1]

[1] McMahon, M. X. H. and Ardoin, S. P. To be submitted to *Journal of Applied Behavior Analysis.*

Abstract

Correspondence training describes a set of procedures used to teach verbal-nonverbal relations, or the relationship between what an organism says and does. In this article, we systematically searched the existing peer-reviewed literature to identify existing high-quality, single case research on correspondence training. We then coded characteristics of each study and the participants within. In the review, 49 reports containing 220 evaluations across six procedural variations of correspondence training (do-say, say-do, say-do-report, set-up upon report, intermediate behavior, set-up upon intermediate behavior) were identified. Of the 220 evaluations, only 20% were considered high-quality. Most of the high-quality evaluations demonstrate therapeutic effects across a variety of adaptive skills using say-do, do-say, say-do-report, and intermediate behavior procedures with children in early childhood education settings. Our review of the correspondence training literature suggests that research is lacking in quality and rigor of the experimental design and particularly in the areas of procedural integrity and social validity. Furthermore, research trends do not demonstrate improvement in quality and rigor of correspondence training over the years. Limitations are discussed along with areas for future growth in the correspondence training literature.

Introduction

Correspondence is the matched relationship between verbal behavior and either nonverbal behavior or additional verbal behavior of an organism (Lloyd, 2002). Caregivers may naturally reinforce correspondence with the goal of teaching their child to tell the truth or keep their promises. Many children learn to accurately report both their past and future behavior without formal instruction and generalize these skills to new contexts (Israel, 1973; Risley & Hart, 1968). However, some children may benefit from correspondence training which involves delivering a reinforcer contingent on verbal-nonverbal relations (Bevill-Davis et al., 2004; Paniagua, 1990). Correspondence is foundational to and often embedded within existing interventions to target self-monitoring, self-assessment, and self-management, as one underlying goal of training is to establish control of an individual's nonverbal behavior using their own verbal response as a discriminative stimulus (Karlan & Rusch, 1982; Paniagua & Baer, 1988). Researchers propose that teaching correspondence may be more beneficial than reinforcing a target response or compliance because of the potential for generalization and minimizing reliance on another person to be present to deliver instructions and serve as the discriminative stimulus (Israel, 1978; Lloyd, 2002).

Several early researchers noted technological and procedural differences published within correspondence training research (Baer, 1990; Bevill-Davis et al., 2004; Israel & O'Leary, 1973; Paniagua, 1990; Paniagua & Baer, 1982). Bevill-Davis et al. (2004) published the most recent review paper of the existing literature that also distinguished between the procedural variations. They identified 33 reports, most of which studied say-do correspondence training with typically developing children, and summarized correspondence training literature in terms of earliest studies, the role of verbal behavior, placement of reinforcer(s) along the response chain, and

generalized correspondence. Bevill-Davis et al. concluded that future researchers should improve external validity by replicating the existing correspondence training research and conduct additional research using children with disabilities as participants and on methods to promote generalization. In the current review, we suggest six correspondence training procedural variations exist: (a) do-say correspondence, (b) say-do correspondence, (c) say-do-report correspondence, (d) set-up upon report, (e) intermediate behavior, and (f) set-up upon intermediate behavior. The total number of procedural variations differ slightly from Bevill-Davis et al. (2004) in that they failed to distinguish between say-do and say-do-report correspondence.

Do-say Correspondence

Risley and Hart (1968) published the first investigation of correspondence training using do-say correspondence. The procedure involves differentially reinforcing the match between prior verbal behavior and nonverbal behavior. Behaviorally, we may refer to this as reinforcing the accuracy of self-reporting. Other conceptualizations of do-say correspondence include establishing morals around truthfulness and honesty, as well as decreasing lying behavior (Sauter et al., 2020; Stocco et al., 2021). Researchers published reports using do-say correspondence training to increase play (Israel & O'Leary, 1973; Paniagua & Baer, 1982; Ribeiro, 1989; Shillingsburg et al., 2017), conversational skills (Jewett & Clark, 1979; Ralph & Birnbrauer, 1986), self-care (Paniagua, 1985; St. Peter et al., 2012; Wilson et al., 1992), self-management (Paniagua, 1987; Paniagua et al., 1990; Paniagua et al., 1988), and academics (Cortez et al., 2014; Domeniconi et al., 2014; Sauter et al., 2020; Stocco et al., 2021). Researchers noted concurrent increases in say-do (described below) when reinforcing do-say (Israel & O'Leary, 1973; Wilson et al., 1992), suggesting training one sequence led to emergence of the reverse.

Other labels for do-say correspondence include reinforcement of corresponding reports and reinforcement of true reports (Paniagua & Baer, 1982; Risley & Hart, 1968).

Say-do Correspondence

The say-do correspondence procedure involves delivery of a reinforcer contingent on accurate reporting of future behavior (Baer, 1990; Israel & O'Leary, 1973). Laypeople may conceptualize reporting on a future response as promise-keeping, dependability, or self-instruction. Say-do correspondence training possesses similarities to compliance training, including the vocalization (i.e., the say response that is often an instruction selected by the experimenter) and efficacy outcomes (Baer et al., 1988; Deacon & Konarski, 1987; Ward & Stare, 1990; Weninger & Baer, 1990). Say-do correspondence and compliance differ topographically with respect to saying then doing versus following an instruction, but on a molar level, corresponding nonverbal behavior are similarly as likely to follow regardless of the procedure (Baer et al., 1988; Matthews et al., 1987). The child's vocalization in say-do correspondence training and the therapist's instruction in compliance training may exert similar control over the future probability of a response. Teaching say-do correspondence may also result in the emergence of do-say and be more efficacious. Prior research suggests that individuals acquire correspondence more rapidly and demonstrate it at higher levels when they learn say-do first, compared to the do-say sequence (Israel & O'Leary, 1973; Karoly & Dirks, 1977). Researchers report using say-do correspondence training to improve participation in play and leisure activities (Baer & Detrich, 1990; Baer et al., 1988; Baer et al., 1984; Bevill et al., 2001; DiCola & Clayton, 2017; Guevremont et al., 1986; Machalicek et al., 2009; Morrison et al., 2002; Paniagua & Baer, 1982; Ward & Stare, 1990; Williams & Stokes, 1982), social skills (Ballard & Jenner, 1981; Osnes et al., 1986; Osnes et al., 1987; Rogers-Warren & Baer, 1976;

Rosenberg et al., 2015), classroom behavior (Huffman et al., 2016; Keogh et al., 1983; Noda & Tanaka-Matsumi, 2009; Osnes et al., 1987; Ruiz-Olivares et al., 2010; Rumsey & Ballard, 1985; Whitman et al., 1982), academics (Cortez et al., 2014; Domeniconi et al., 2014; Hopman & Glynn, 1989; Rumsey & Ballard, 1985; Weninger & Baer, 1990), self-care (Baer et al., 1987; Friedman et al., 1990), and self-management (Paniagua, 1987; Paniagua & Black, 1990; Paniagua et al., 1988). Say-do correspondence is also referred to as report-do correspondence and reinforcement of fulfillment of promises in the literature (Paniagua, 1990; Paniagua & Baer, 1982).

Say-do-report C**orrespondence**

Researchers combined say-do and do-say chains to develop say-do-report correspondence. In this procedure, the individual is expected to say what they are going to do, do what they said, and then report that they did what they said they would do. Previous applications include increasing listening skills (Keogh et al., 1983), social skills (Ralph & Birnbrauer, 1986), math performance (Roca & Gross, 1996), good posture (Luciano-Soriano et al., 2000), and school transitions (Huffman et al., 2016). Researchers have also referred to this procedure as say-do-say correspondence, report-do-report correspondence, or say-do-description training (Keogh et al., 1983; Luciano-Soriano et al., 2000; Roca & Gross, 1996).

Set-up upon Report

The set-up upon report procedure is similar to say-do correspondence except that in the reinforcement set-up upon say procedure, opportunities for reinforcement are programmed at two points in the response chain (the “set-up” and corresponding nonverbal response). In the reinforcement set-up upon report procedure, the experimenter temporarily reveals the reinforcer to the child after they emits the vocalization (the “set-up”) and delivers the reinforcer contingent

on corresponding nonverbal behavior. If the child engages in nonverbal behavior that does not match the vocalization, often referred to as noncorrespondence, the experimenter withholds access to the reinforcer. In past research comparing say-do sequences, researchers observed higher levels of target behavior when they "set up" the reinforcer, than when they directly reinforced say-do correspondence (Paniagua & Baer, 1982). Paniagua and Baer (1982) proposed that reinforcement magnitude, or the quantity of reinforcement for correspondence, could explain more observed targeted play than the reinforcement of say-do correspondence. Researchers also refer to this procedure as reinforcement set up upon promise (Paniagua & Baer, 1982) and have used this procedure to increase self-management (Paniagua, 1987; Paniagua et al., 1990; Paniagua et al., 1988) and social initiations (Rosenberg et al., 2015).

Intermediate Behavior

In the reinforcement of intermediate behavior arrangement, the child emits the vocalization, and the experimenter immediately delivers reinforcement contingent on responses that precede corresponding nonverbal behavior; however, no consequences are programmed for the occurrence or nonoccurrence of nonverbal behavior. For example, for a child that vocalizes that they are going to make a sandwich, the experimenter would reinforce steps in the chain leading up to making a sandwich (e.g., walking to the kitchen, getting two slices bread, collecting ingredients and condiments, etc.) and not the completion of the sandwich. To our knowledge, only one published study that used immediate reinforcement of intermediate behavior to increase activity engagement in school exists (Paniagua et al., 1982).

Set-up upon Intermediate Behavior

The set-up upon intermediate behavior procedure uses the set-up strategy similar to the set-up upon report variation but also incorporates the say-intermediate behavior-do sequence and

a token economy. Following the child's vocalization, the experimenter delivers tokens contingent on intermediate responses in the chain. After the last intermediate response, the child exchanges tokens for a backup reinforcer that the experimenter delivers contingent on the occurrence of corresponding nonverbal behavior (i.e., setting up for the completion of the chain). Researchers used this procedure to increase play for preschool-aged children (Paniagua & Baer, 1982).

Purpose

Correspondence training encompasses all instructional methods for teaching verbal and nonverbal relations. The broadness of the term leaves much room for interpretation as the term itself does not say anything about the specific methods used, nor does it provide any clarification about the behavioral sequence of interest. Although researchers identified a need for additional conciseness and clarity when differentiating among correspondence training procedures (Baer et al., 1968; Paniagua, 1990), to date, no research has assessed the quality and rigor of existing correspondence training research. Therefore, researchers cannot confidently make conclusions about what correspondence procedures reliably work, for whom they work, and under what conditions.

The purpose of the current study was to systematically review the existing single case literature on correspondence training in alignment with the procedural variants. We also aimed to identify and summarize the high-quality correspondence training research. Currently, there are no systematic reviews on correspondence training that consider quality and rigor of existing research. This study also sought to provide an update to the published literature review by Bevill-Davis et al. (2004).

Method

Search Procedures

Two graduate-level students with experience in applied behavior analysis and verbal behavior used the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) 2020 Guidelines (Page et al., 2021) to independently screen records and assess reports that met eligibility criteria for inclusion in the review. A database search using EBSCOhost Database was conducted across five electronic databases in education, medicine, and psychology (APA PsycInfo, ERIC, Education Research Complete, MEDLINE, Psychology and Behavioral Sciences Collection) to identify existing correspondence training studies (see Figure 1 for PRISMA 2020 flow diagram). Using the Advanced Search function, we included all reports with the search terms, *correspondence training, say-do correspondence,* or *do-say correspondence,* and limited the search (i.e., applied filters) to peer-reviewed publications in the English language. The search included reports through August 16, 2021. Reports were also identified by reviewing citations in the reference lists of six review papers on correspondence training (i.e., Baer, 1990; Bevill-Davis et al., 2004; Israel, 1978; Karlan & Rusch, 1982; Lloyd, 2002; Paniagua, 1990) in addition to those found in the database search.

Eligibility Criteria

After removing duplicate reports, we screened the title and abstract of each record and included those with correspondence training as the primary focus. Review and discussion articles and records that clearly indicated a focus that was unrelated to correspondence training (e.g., sound/symbol or grapheme-phoneme correspondence) were excluded. We retrieved the remaining reports from both the database and citation search and further assessed eligibility by examining the method section. Using the Single Case Analysis and Review Framework

(SCARF; Ledford et al., 2020) to guide inclusionary criteria, we included reports if they (a) used single case experimental design to assess the effects of correspondence training and (b) included graphed data on the dependent variable in the study. Due to our interests in applied applications of correspondence training and differences among procedural variations, only reports with human participants and isolated variations of correspondence training procedures were included. Reports were excluded if they employed group design methodology, used single case designs that lacked experimental rigor (i.e., AB designs, changing criterion designs), or did not contain graphed results on the effects of correspondence training. Reports were also excluded if researchers used multi-component treatment packages that were comprised of more than one correspondence training variation; this was due to the inability to categorize and distinguish between the effects of one correspondence training variation procedure over another.

Data Extraction, Coding, and Inter-coder Agreement

The database search was completed independently by separate coders using the search procedures and eligibility criteria described above for 100% of reports. For the database search, agreements were defined as both coders recording that a report met eligibility criteria for inclusion in the review. We used systematic coding procedures to collect quantitative variables (report descriptors, participant characteristics) from included reports and transferred these data onto a Microsoft Excel spreadsheet. Quality indicator measurements were also scored using a Microsoft Excel spreadsheet provided by the developers of the SCARF that can be accessed via the website (http://ebip.vkcsites.org/scarfv2).

The primary author and a secondary coder independently executed search procedures and screened reports using eligibility criteria for 100% of reports. Coders scored an agreement if the total number of reports matched at each step of the PRISMA search procedure and a

disagreement when these numbers did not match. We calculated inter-coder agreement on reports that met eligibility criteria by calculating the total number of agreements and dividing this total by the summative of agreements and disagreements and multiplying this number by 100 to yield a percentage agreement. Inter-coder agreement for the inclusion of reports equaled 98%. For study and participant variables and quality indicator measures, researchers used binary coding to score the presence or absence of a variable in each report (i.e., occurrence/ nonoccurrence). We also calculated inter-coder agreement for report and participant characteristics and quality indicator measurements using similar methods described above for 27% of reports and single case experimental designs and 29% of participants. Following the calculation of inter-coder agreement, coders met to review discrepancies, or disagreement among two scores, and came to a consensus on the correct score together. Inter-coder agreement equaled 90% (range, 79% to 100%) for reports and single case experimental designs and 96% (range, 93% to 100%) for participants.

Study Descriptors

We coded eligible reports for the procedural variation of focus (i.e., do-say, say-do, say-do-report, set-up upon report, intermediate behavior, set-up upon intermediate behavior) and the single case experimental design used to evaluate the procedure(s). When coding for use of a single case design in each report, we indicated the design that researchers used to assess verbal-nonverbal relations even if the primary single case design was intended to assess reinforcement for verbalizations (e.g., Baer et al., 1985; Bevill et al., 2001; Crouch et al., 1984). For example, in cases when researchers used a multiple-baseline design across behavior to experimentally evaluate the effects of reinforcement of vocalization and only implemented the reinforcement of correspondence procedure in one tier between two baseline procedures (i.e., ABA design), the

coders scored a reversal design and not a multiple-baseline design. We established the presence of inter-observer agreement and procedural integrity, and assessment of generalization, maintenance and social validity using coded scores from the SCARF, as described below.

Quality Indicator Measurements

We selected the SCARF because of our interest in evaluating a group of single case experimental designs (hereby interchangeably referred to as evaluations) across reports in addition to assessing quality, as previously outlined by Horner et al. (2005) and What Works Clearinghouse (Kratochwill et al., 2010). We identified each single case experimental design used to evaluate correspondence training and scored the report and evaluations along a range of standards outlined by the SCARF. If researchers combined or embedded multiple single case designs, we coded each design separately as the demonstrations of an effect may have varied across evaluations.

The SCARF uses binary code to assess for the presence (Yes/1) or absence (No/0) of study characteristics and a 5-point ordinal scale to assess primary, generalization, and maintenance outcome measures. For each single case experimental design, we coded for measures of experimental rigor (i.e., assessment of inter-observer agreement, procedural integrity, and sufficiency of data) and quality and breadth of reported measurement (i.e., descriptions of participants, operational definitions, experimental conditions, and social/ecological validity). Researchers calculated the overall study quality and rigor using the formula, $\frac{Quality\ score+2(Rigor\ score)}{3}$, and yielded scores ranging from 0.0 to 4.0 (i.e., no evidence to high quality evidence) on a continuous scale. Coders used visual analysis (i.e., immediacy of an effect, consistency of data patterns across similar phases, overlap, level, trend, variability) to examine whether data points in the single case experimental design presented evidence of a

therapeutic, countertherapeutic, or no effect to yield the primary outcome score. A score of 0 indicated the absence of an effect or presence of a countertherapeutic effect and a score of 4 revealed at least three strong demonstrations of an effect (i.e., experimental control). The SCARF authors designed the Microsoft Excel spreadsheet to graph each single case experimental design based on primary outcome score along the *y*-axis and overall study quality and rigor score along the *x*-axis on a scatterplot divided into four quadrants. The SCARF categorizes studies into one of four categories based on the scatterplot quadrant that it falls into: High-quality evidence of positive effects, high-quality evidence of negative or minimal effects, low-quality evidence of positive effects, and low-quality evidence of negative or minimal effects.

We scored generalization measures if researchers assessed for stimulus and/or response generalization outside of the training context and measured maintenance using data in the phase that immediately followed discontinuation of continuous reinforcement for verbal-nonverbal relations (i.e., correspondence). For both generalization and maintenance outcomes, a score of 0 indicated that researchers did not evaluate generalization or maintenance and a score of 4 indicated all strong positive effects. If researchers assessed for generalization, we indicated if this was done post-test (i.e., once at the end of the evaluation), pre- and post-test (i.e., prior to and following the evaluation), intermittently (i.e., fewer than three times throughout the evaluation), or experimentally (i.e., greater than three times throughout the evaluation), as outlined by the SCARF. For reports that assessed maintenance, we indicated the latency of time with which experimenters assessed maintenance (i.e., immediately following the evaluation, less than one week after, between one week to just short of one month, or one month or greater).

Participant Characteristics

We coded descriptive information only on participants who received correspondence training from eligible reports containing high-quality evidence, as categorized by the SCARF. We excluded any participants who may have served as a normative comparison (e.g., Crouch et al., 1984; Paniagua et al., 1982) or only received reinforcement for vocalizations (e.g., Baer et al., 1985; Bevill et al., 2001; Crouch et al., 1984). Demographic characteristics included age, sex assignment, ethnic and/or racial group, level of education, socioeconomic status, disability status, and setting descriptors (i.e., setting, implementer). In instances when researchers reported an age range across participants in place of a specific age for each participant, we recorded an approximate age based on the average of the age range by summing the ages of the bottom and top ranges and dividing the quotient by two. If researchers neglected to report specific participant characteristics, we coded this as “Not Reported”.

Results

Results of the database search using PRISMA 2020 guidelines are displayed in Figure 1. The database search yielded 210 records and automatically removed 110 duplicate records. We screened the titles and abstracts of 100 records to remove additional duplicate records that were missed by the automation tools (n = 2), discussion or review articles (n = 22), and articles in which the primary focus of the report was not correspondence training (n = 6). We retrieved 70 records to further assess the full text for eligibility criteria. After reviewing the full text, reports that employed methodology other than single case experimental design (n = 15), neglected to include charted results for visual analysis (n = 5), were considered basic or translational research (n = 3), or did not isolate correspondence training procedures (n = 1) were excluded. Forty-five reports from the database search met eligibility criteria to be included in the review. Researchers

identified 10 additional reports through citation searching and reviewed the full text to assess for eligibility criteria. Eight reports did not meet eligibility criteria, resulting in removal of reports that did not include a single case experimental design (n = 4), contained discussion or reviews (n = 1), and contained results that were not graphed (n = 1). Four reports met eligibility through citation searching. Thus, 49 reports on correspondence training met eligibility criteria to be included in the systematic review.

Study Descriptors

A summary of study descriptors can be found in Table 1. Say-do correspondence continues to dominate the peer-reviewed, single case literature (57% of reports), followed by do-say correspondence (31%), set-up upon report (14%), and say-do-report (12%). Researchers reported evaluating the efficacy of correspondence training procedures using the full variety of single case experimental design, including a multiple baseline design across subjects (61%), reversal or withdrawal (49%), a multiple baseline design across behavior (24%) and settings (14%), as well as alternating treatments (4%). Most reports contained inter-observer agreement (94%), but many did not include procedural integrity (12%) and social validity (14%). Reports also contained data on stimulus or response generalization outside of a multiple baseline design (53%), as well as maintenance that included removal of treatment and follow up (69%).

Quality Indicator Measurement

We used the SCARF to evaluate 220 single case experimental designs on the quality of measurement, rigor of the design, and outcomes in terms of primary outcome efficacy, generalization, and maintenance. Table 2 presents a summary of the SCARF outcomes across primary, generalization, and maintenance measures. Figure 2 depicts the primary outcomes for all evaluations on the scatterplot and Figure 3 displays the number of total evaluations, number

of high-quality evaluations, and the percentage of the total number of evaluations that were considered high-quality by year. Figure 4 and Figure 5 display the outcomes for evaluations that assessed for generalization and maintenance measures, respectively.

We identified 43 high-quality evaluations, representing 20% of the total single case experimental designs that we evaluated. The say-do-report variation yielded the highest mean score for overall study quality and rigor of 2.7, although it represented only 9% of the high-quality evaluations. The say-do procedure represented most of the evaluations with both positive effects (51%) and negative or minimal effects (19%). A review of the 10 total evaluations with negative or minimal effects (i.e., 8 say-do evaluations, one say-do-report evaluation, and one do-say evaluation) revealed no counter-therapeutic effects but rather insufficient data to confidently demonstrate an effect (Huffman et al., 2016), no differentiation between say-do correspondence and compliance that both reached therapeutic levels (Weninger & Baer, 1990), and selection of a response already at therapeutic levels (Paniagua & Black, 1993). Based on our review, there are currently no high-quality evaluations using the set-up upon report procedure or set-up upon intermediate behavior procedure.

Our analysis of publication trend suggests that the total number of published correspondence training evaluations peaked in the 1980s (n = 123) and most of the high-quality evaluations were published in the 1990s (n = 19, 36%). We observed an overall decrease in the amount and quality of published research on correspondence training.

Researchers assessed for generalization in 70 studies (32%) using pre- and/or post-tests or assessed generalization either experimentally or intermittently. Although researchers measured generalization experimentally (i.e., at least three times in each condition) during say-do correspondence for most evaluations (56%), the do-say and say-do-report procedures received

higher scores for generalized outcomes, 2.2 and 2.4, respectively, than say-do which yielded a score of 1.7. The set-up upon report received the lowest score, 1.0. Of the reports evaluated, researchers did not assess whether generalization occurred when using the intermediate behavior or set-up upon intermediate behavior procedures.

Researchers measured maintenance in 142 studies (65%) across all correspondence training procedures and latencies (i.e., immediate, >1 week, 1 week to < 1 month, ≥ 1 month) following the discontinuation of continuous reinforcement for verbal-nonverbal relations. The say-do procedure garnered the most evaluations of maintenance. Maintenance was assessed the longest for say-do and say-do-report correspondence training (i.e., a month or longer following the end of the evaluation), yielding an average score of 2.4 and 3.1, respectively.

Participant Characteristics

Data on participant characteristics are available in Table 3. We identified 78 individual participants and two participant groups (i.e., classrooms) who partook in high-quality evaluations of correspondence training. Table 3 contains demographic information for individual participants and group data are denoted using asterisks. Researchers reported using correspondence training most frequently with males (n = 46, 74% of participants with reported gender). The age of participants ranged from 3 years, 6 months to 24-years-old (M = 8 years, 1 month; SD = 5 years), most of whom were children (i.e., 12 years and younger; n = 60, 85% of participants with reported age) and placed in early childhood education (n = 26, 40%), primary education (n = 23, 35%) or special education settings (n = 16, 25%). Many reports did not report a participant's race/ethnicity (n = 70, 90%) or socioeconomic status (n = 70, 90%); of the reports that did, most participants were White (n = 7, 88% of participants with reported race/ethnicity) and all were of the middle class (n = 8, 100% of participants with reported socioeconomic status). Although

most participants presented as having a neurodevelopmental disorder (*n* = 33, 62% of participants with reported disability status), researchers also identified several participants as typically developing (*n* = 20, 38% of participants with reported disability status). Researchers most frequently targeted leisure activities (*n* = 27, 35%) and conducted training in an educational setting (*n* = 74, 95%) using experimenters as behavior-change agents (*n* = 67, 86%).

Discussion

This review aimed to answer the questions, what correspondence procedures reliably work, for whom they work for, and under what conditions. A secondary goal of this review was to identify areas for growth within correspondence training. Albeit the small sample of high-quality research, we discovered positive effects of correspondence training across the say-do, do-say, say-do-report, and intermediate behavior variations. Say-do-report and intermediate behavior were less frequently studied but yielded the highest score for overall study quality and rigor. Of the high-quality evaluations of negative or minimal effects, say-do, say-do-report, and do-say procedures still achieved therapeutic effects. Most high-quality evaluations in this review reported experimenters implementing correspondence training procedures in educational settings to address a variety of adaptive skills for young learners both with and without disabilities.

Our review yielded 14% of reports in the last 53 years that assessed for social validity and reflect those of behavior analysis publication trends today (Carr et al., 1999; Ferguson et al., 2019). Assessing social validity is of the utmost importance to address future concerns of the consumer, but also to establish another metric for assessing socially significant change and selecting one intervention over another that is equal in efficacy (Hanley et al., 1997; Wolf, 1978), one example being reinforcing compliance versus correspondence. Furthermore, Wolf (1978) describes multiple layers of social importance in applied-behavior-analytic work,

including the goals, procedures, and effects of treatment, suggesting a need for assessment at multiple time points in treatment using a variety of methods (e.g., questionnaires, consumer choice, normative comparisons etc.). Behavior analysts must develop the habit of assessing social validity in research and practice so that we may use these findings to guide selection of goals and intervention strategies. Future researchers may also expand correspondence training research by developing caregiver- or teacher-mediated interventions that target correspondence or generalize these procedures to indigenous implementers. Researchers often taught correspondence in natural or typical environments, but not with indigenous implementers, thus limiting the generality and external validity of these procedures (Baer et al., 1968). Past research also suggests that social acceptability can shift based on the time and effort required to implement intervention procedures (Witt et al., 1984), further emphasizing the importance of measuring social validity at several points during treatment and following caregiver training.

Our review also exposed the lack of procedural integrity collected, even in more recent correspondence training research. Only six reports (12%) described any collection of procedural integrity, which reflects the trends of current publications in behavior analysis. In fact, correspondence training is trailing behind recent procedural integrity reporting trends across major behavior-analytic journals (i.e., approximately 30% of published research reports; Ledford & Wolery, 2013). The lack of procedural integrity in past research may account for the slowed growth and continuation of correspondence training research due to concerns with replicability, and is certainly an area that correspondence training researchers could improve upon (Lloyd, 2002).

Few studies observed generalized correspondence, further highlighting a need for methodology to promote generalization (Bevill-Davis et al., 2004). Limited research suggests do-

say or say-do-report (i.e., the combination of say-do and do-say) procedures may generalize to other contexts better than say-do correspondence alone. To our surprise, most of the reports we evaluated assessed for maintenance. However, researchers often assessed maintenance up to a week after the evaluation and rarely long-term, thus, limiting the already mixed findings. Teaching say-do correspondence with increased time intervals between verbal behavior and the opportunity to engage in nonverbal behavior (i.e., a time delay) may be a strategy to promote generalization and maintenance (Israel, 1978). There are significant benefits to programming a time delay, including training say-do correspondence in the absence of ongoing monitoring and increasing tolerance for delays to reinforcement. The few studies (Baer et al., 1983; Guevremont et al., 1986; Jewett & Clark, 1979; Weninger & Baer, 1990) that trained correspondence using a time delay suggest promising results for maintenance and improving behavior across settings. If an overarching aim of correspondence training is to assess correspondence in inaccessible settings or when ongoing monitoring proves challenging, future research should also assess for generalized correspondence across settings.

Limitations

We note several limitations of this review. Researchers evaluated maintenance in an assortment of ways (e.g., immediate withdrawal, systematic thinning, indigenous implementers; Baer, 1990). In the current review, we coded maintenance outcomes by assessing the phase that immediately followed correspondence if the condition discontinued continuous reinforcement for verbal-nonverbal relations, but we did not differentiate among methods (e.g., reinforcement of vocalization, intermittent or delayed reinforcement, or removal of the vocalization and reinforcement altogether [i.e., baseline]). Future research may seek to differentiate among

variations of maintenance when assessing maintenance failure to better understand methods of promoting maintenance.

Researchers often included additional treatments prior to and/or in conjunction with correspondence training evaluations, but we did not collect these data. For example, past reviews noted that researchers delivered reinforcement for vocalization prior to reinforcing correspondence and used correspondence training in combination with token economies (Bevill-Davis et al., 2004; Lloyd, 2002). Quantifying other treatments in the correspondence training literature may have yielded additional information about common methods to evaluate verbal-nonverbal relations and frequently used treatment components. Still, additional research about the potential for order effects (Paniagua & Baer, 1982) and active/inactive independent variables in multi-component treatment packages (Rogers-Warren et al., 1977) is warranted. Future research may also attempt to control for order effects or conduct a component analysis with an eye toward sufficiency of necessary components (see Ward-Horner & Sturmey, 2010 for a review).

In conclusion, say-do correspondence is the most researched procedural variation of correspondence training. Four correspondence training variations (say-do, do-say, say-do-report, and intermediate behavior) show promising effects at increasing adaptive behavior with young children. Our assessment of publication trends suggest that correspondence training research has declined over the years and does not appear to be improving in terms of quality and rigor. Correspondence training continues to be an understudied area of research within behavior analysis.

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Table 1.

Summary of Study Characteristics

Characteristic	*n* (%)
Correspondence Training Procedure	
Say-do	28 (57)
Do-say	15 (31)
Set-up upon report	7 (14)
Say-do-report	6 (12)
Intermediate behavior	1 (2)
Set-up upon intermediate behavior	1 (2)
Single Case Experimental Designs	
Multiple baseline across subjects	30 (61)
Reversal/withdrawal	24 (49)
Multiple baseline across behavior	12 (24)
Multiple baseline across settings	7 (14)
Alternating treatments	2 (4)
Reliability	
Inter-observer Agreement	46 (94)
Procedural Integrity	6 (12)
Generalization	26 (53)
Maintenance	34 (69)
Social Validity	7 (14)

Note: Includes data from $N = 49$ reports containing single case designs.

Table 2.

SCARF Measurement Outcomes

Primary Outcome Category	*n* (%)	Primary Outcomes	Overall Study Quality & Rigor
High-quality Evidence of Positive Effects			
Say-do	22 (51)	3.7	2.5
Do-say	5 (12)	4.0	2.3
Say-do-report	4 (9)	4.0	2.7
Intermediate behavior	2 (5)	4.0	2.4
High-quality Evidence of Negative or Minimal Effects			
Say-do	8 (19)	0.0	2.3
Say-do-report	1 (2)	1.0	2.7
Do-say	1 (2)	0.0	2.2
Low-quality Evidence of Positive Effects			
Say-do	11	3.1	1.8
Do-say	10	3.7	1.7
Set-up upon report	3	3.7	1.5
Set-up upon intermediate behavior	2	4.0	1.9
Intermediate behavior	1	4.0	1.8
Low-quality Evidence of Negative or Minimal Effects			
Say-do	86	0.9	1.5
Do-say	32	1.0	1.2
Set-up upon report	17	1.0	1.2
Intermediate behavior	4	1.0	1.6
Say-do-report	10	1.0	1.6
Set-up upon intermediate behavior	1	1.0	1.1
Quality & Rigor of Generalization Measurement	*n* (%)	Generalized Outcomes	
Say-do			
Experimentally	39 (56)	1.7	
Intermittently	3 (4)	1.7	
Pre/Post	1 (1)	2.0	
Do-say			
Experimentally	12 (17)	2.2	
Intermittently	2 (3)	3.5	
Say-do-report			
Experimentally	10 (14)	2.4	
Set-up upon report			
Experimentally	3 (4)	1.0	

(continued)

Latency of Maintenance Measurement	*n* (%)	Maintained Outcomes
Say-do		
>1 Week	36 (25)	2.3
1 Week to < 1 Month	27 (19)	1.9
≥ 1 Month	11 (8)	2.4
Do-say		
>1 Week	19 (13)	3.5
1 Week to < 1 Month	10 (7)	1.6
Immediate	1 (1)	2.0
Say-do-report		
>1 Week	3 (2)	4.0
≥ 1 Month	9 (6)	3.1
1 Week to < 1 Month	2 (1)	4.0
Set-up upon report		
>1 Week	13 (9)	4.0
1 Week to < 1 Month	3 (2)	3.3
Intermediate behavior		
>1 Week	4 (3)	2.3
1 Week to < 1 Month	3 (2)	1.7

Note: Includes data from $N = 220$ single case designs across included reports on correspondence training.

Table 3.

Summary of Participant Characteristics

Participant Characteristic	Correspondence Training Variation						
	Say-do	Do-say	Say-do-report	Set-up upon report	Intermediate behavior	Set-up upon intermediate behavior	Total
	n (%)	*n* (%)	*n* (%)	*n* (%)	*n* (%)	*n* (%)	*N* (%)
Participants							
Individual	52 (67)	13 (17)	11 (14)	3 (4)	2 (3)	0	78
Group*	2 (100)	0	0	0	0	0	2
Gender							
Male	30 (65)	7 (15)	10 (22)	2 (4)	0	0	46 (74)
Female	11 (69)	3 (19)	1 (6)	1 (6)	0	0	16 (26)
Not reported	11 (69)	3 (19)	0	0	2 (13)	0	16 (21)
Age							
12 years and younger	45 (75)	6 (10)	4 (7)	3 (5)	2 (3)	0	60 (85)
13-17 years	0	4 (50)	4 (50)	0	0	0	8 (11)
18+ years	0	3 (100)	3 (100)	0	0	0	3 (4)
Not reported	7 (100)	0	0	0	0	0	7 (9)
Race/Ethnicity							
White	6 (86)	1 (14)	0	0	0	0	7 (88)
Asian	1 (100)	0	0	0	0	0	1 (13)
Not reported	45 (64)	12 (17)	11 (16)	3 (4)	2 (3)	0	70 (90)

(continued)

Participant Characteristic	Correspondence Training Variation						
	Say-do	Do-say	Say-do-report	Set-up upon report	Intermediate behavior	Set-up upon intermediate behavior	Total
	n (%)	*n* (%)	*n* (%)	*n* (%)	*n* (%)	*n* (%)	*N* (%)
Level of Education							
Early childhood	20* (77)	3 (12)	1 (4)	0	2 (8)	0	26 (40)
Primary	17 (74)	0	3 (13)	3 (13)	0	0	23 (35)
Special education	8 (50)	4 (25)	4 (25)	0	0	0	16 (25)
Not reported	5 (45)	6 (55)	3 (27)	0	0	0	11 (14)
Socioeconomic Status							
Middle	5 (63)	3 (38)	0	0	0	0	8 (100)
Not reported	47 (67)	10 (14)	11 (16)	3 (4)	2 (3)	0	70 (90)
Disability Status							
Neurodevelopmental (e.g., ID, ASD, ADHD)	17 (52)	8 (24)	8 (24)	3 (9)	0	0	33 (62)
Typically developing	15* (75)	0	3 (15)	0	2 (10)	0	20 (38)
Not reported	23 (82)	5 (18)	0	0	0	0	28 (36)
Adaptive Behavior Category							
Leisure	25 (93)	0	0	0	2 (7)	0	27 (35)
Functional Academics	9 (64)	2 (14)	3 (21)	0	0	0	14 (18)
Self-care	10 (71)	4 (29)	0	0	0	0	14 (18)
Social Skills	1 (8)	6 (46)	6 (46)	3 (23)	0	0	13 (17)
School/Home Living	9 (90)	0	1 (10)	0	0	0	10 (13)
Community Use	4* (50)	0	4 (50)	0	0	0	8 (10)
Self-management	0	1 (100)	0	0	0	0	1 (1)

(continued)

Participant Characteristic	Correspondence Training Variation						
	Say-do	Do-say	Say-do-report	Set-up upon report	Intermediate behavior	Set-up upon intermediate behavior	Total
	n (%)	*n* (%)	*n* (%)	*n* (%)	*n* (%)	*n* (%)	*N* (%)
Setting							
Educational	52* (70)	9 (12)	8 (11)	3 (4)	2 (3)	0	74 (95)
Healthcare	0	1 (100)	0	0	0	0	1 (1)
Home	0	6 (100)	3 (50)	0	0	0	6 (8)
Implementer							
Experimenter	47* (70)	10 (15)	10 (15)	3 (4)	0	0	67 (86)
Teacher	5* (45)	3 (27)	1 (9)	0	2 (18)	0	11 (14)

Note: Includes data from *N* = 78 individual participants with single case designs across correspondence training variations. Asterisks (*) denote data from groups. Percentages reflect the characteristics from reported data if non-reported data also existed and not reported data percentages are yielded from the total number of individual participants. ID = Intellectual disability, ASD = Autism spectrum disorder, ADHD = Attention-deficit hyperactivity disorder

Figure 1.

PRISMA Flow Diagram

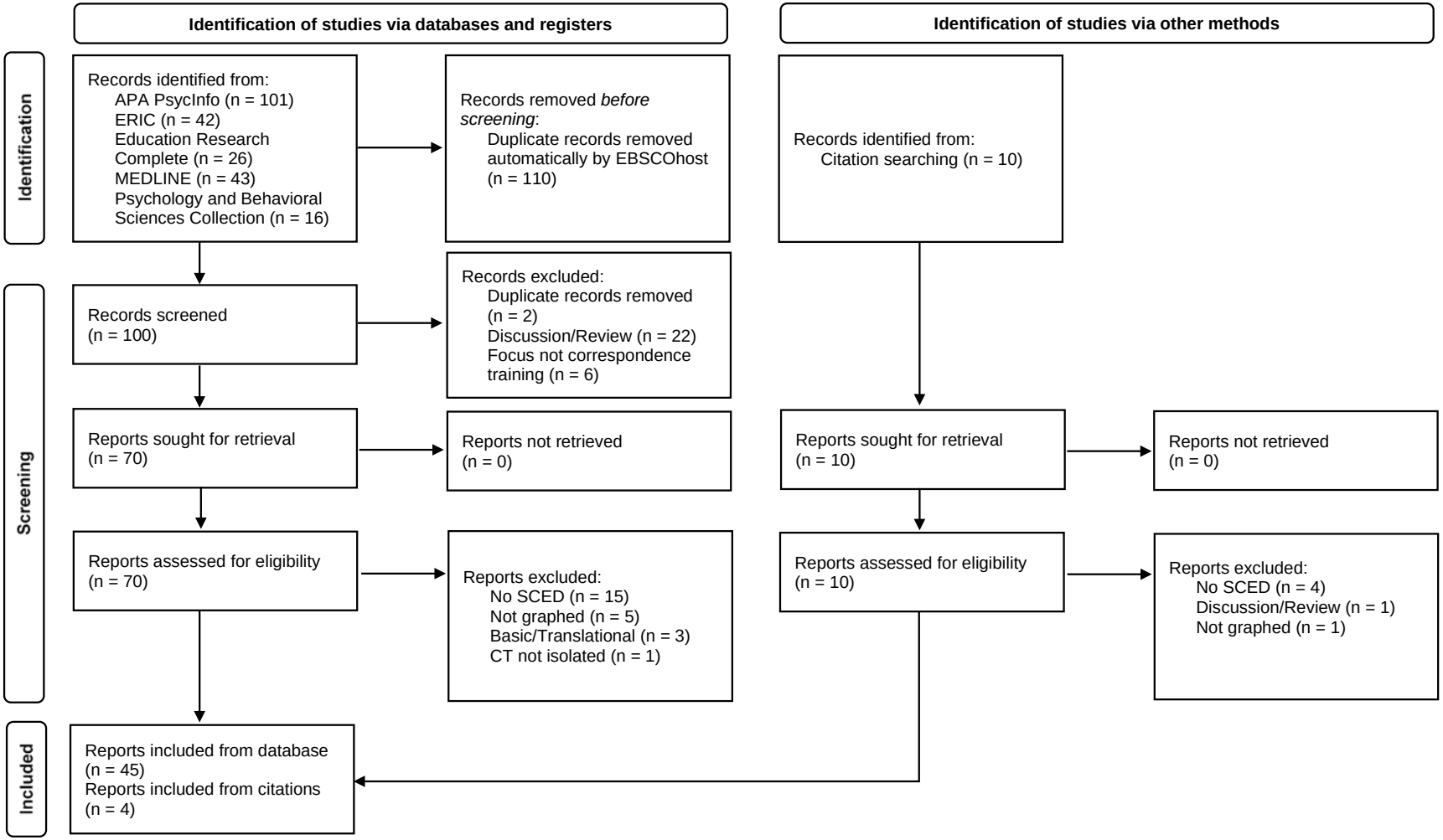


Figure 2.

SCARF Primary Outcome Scatterplots

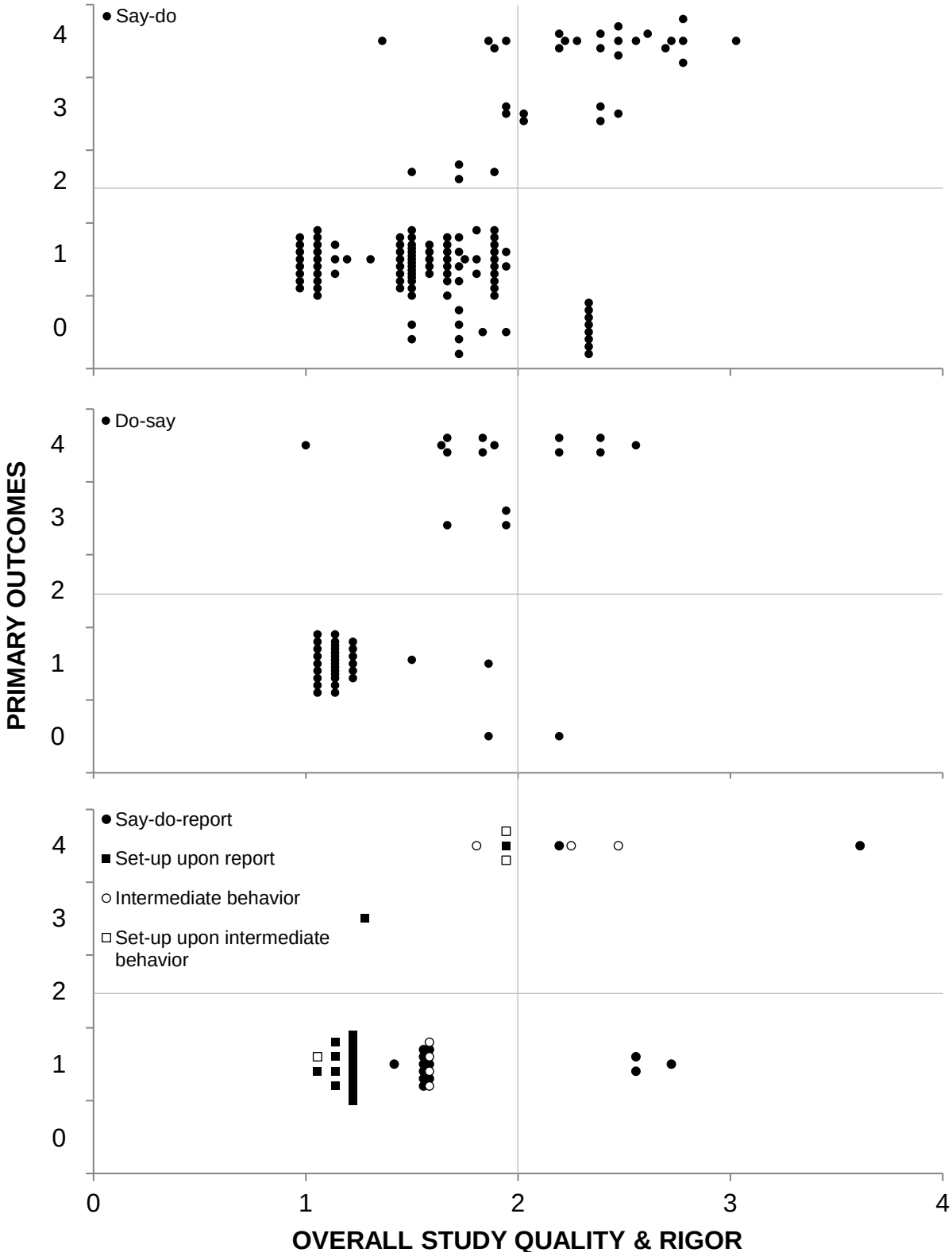
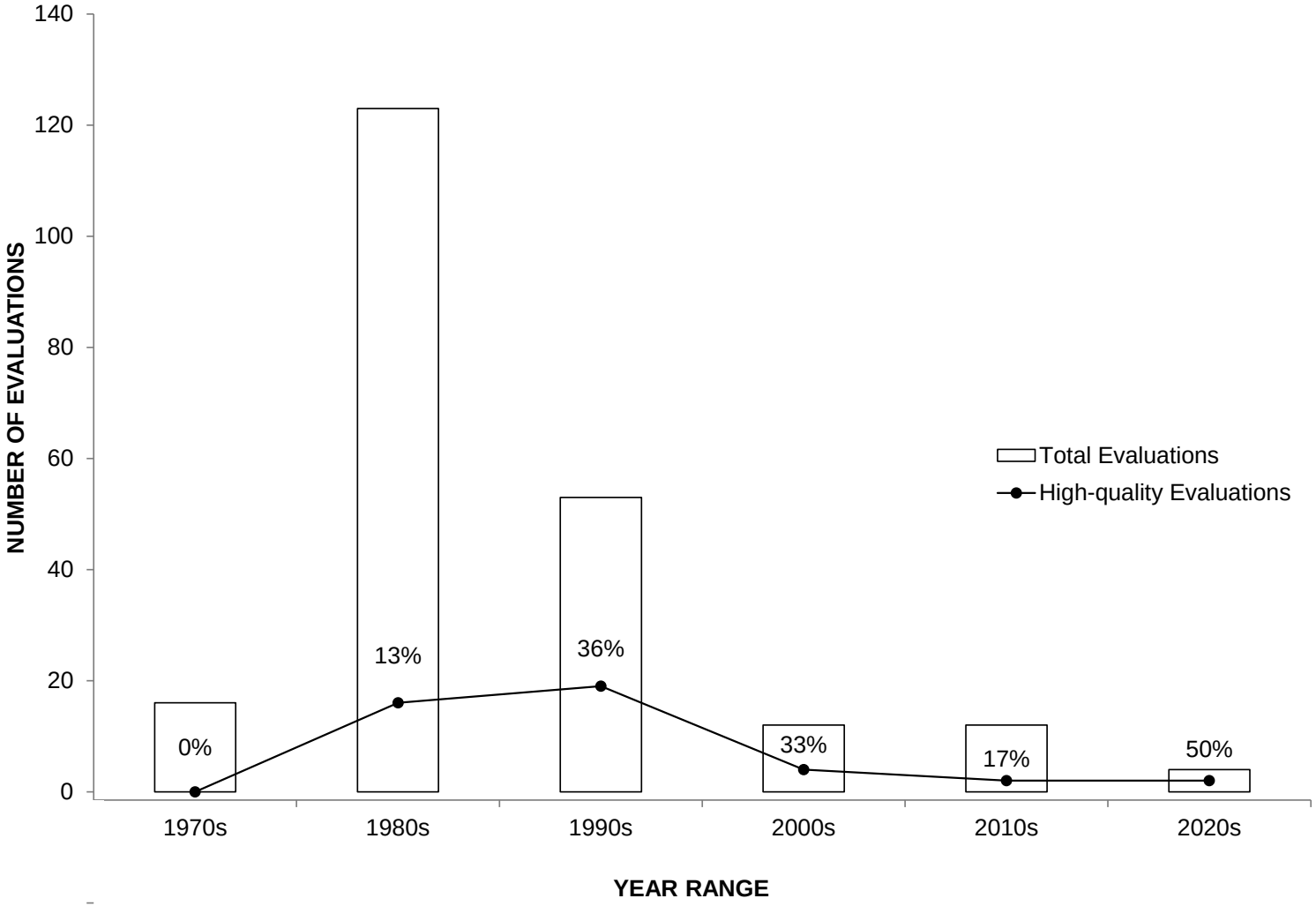


Figure 3.

Total and High-quality Evaluations by Year



Note. Percentages reflect the percentage of total evaluations (N = 220) that the SCARF categorized as high-quality (n = 50).

Figure 4.

SCARF Generalized Outcome Scatterplots

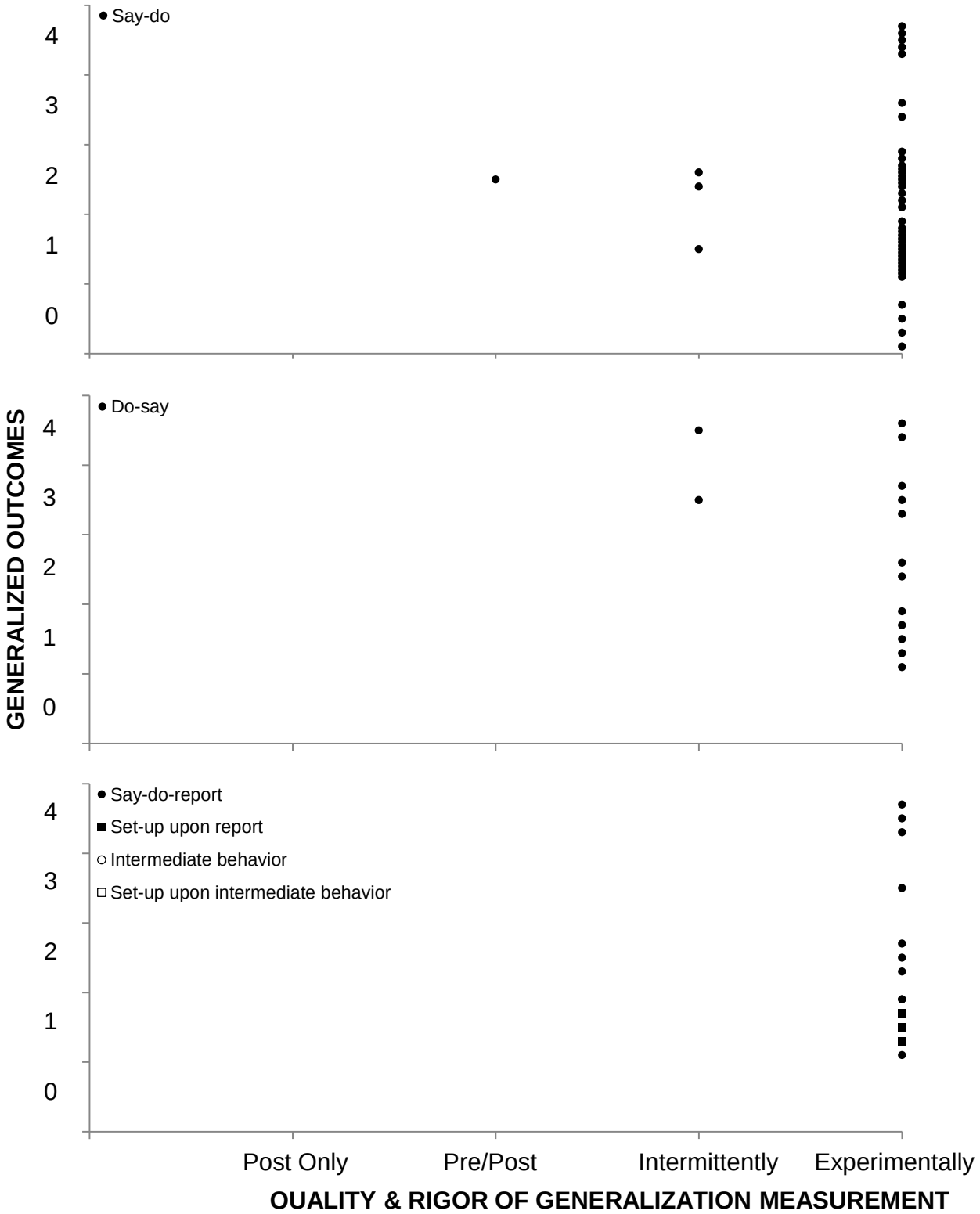
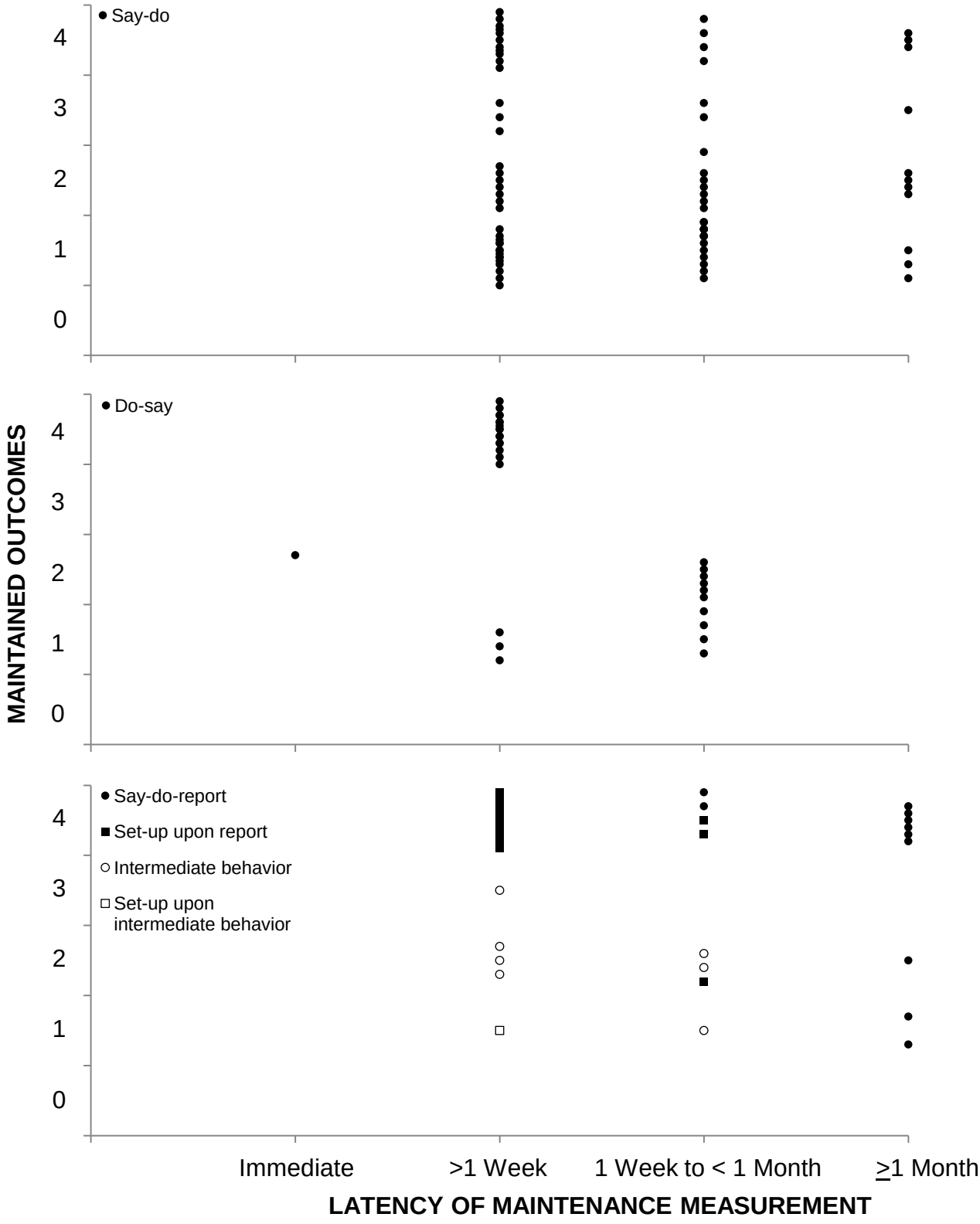


Figure 5.

SCARF Maintained Outcome Scatterplots



CHAPTER 3

ESTABLISHING EATING GOALS AND INCREASING INDEPENDENCE IN MEALS USING SAY-DO CORRESPONDENCE TRAINING [2]

[2] McMahon, M. X. H., Ardoin, S. P., and Volkert, V. M. To be submitted to *Behavior Analysis: Research and Practice.*

Abstract

Differential reinforcement is a commonly prescribed treatment component used to increase acceptance for children with avoidant/restrictive food intake disorder (Sharp et al., 2010). Although research supports using repeated taste exposure and social and tangible rewards to reinforce acceptance of foods, reinforcement strategies remain controversial and caregivers may be less likely to implement procedures with high integrity if the treatment possesses low social validity (Allen & Warzak, 2000; Cooke et al., 2011). Say-do correspondence describes an event when an individual does what they said they would do, and prior research suggests differentially reinforcing correspondence versus compliance may be similarly efficacious (Deacon & Konarski, 1987; Weninger & Baer, 1990). In the current study, we evaluated the use of say-do correspondence training to increase independent self-feeding for a child with comorbid avoidant/restrictive food intake disorder and autism spectrum disorder. Results demonstrated an overall increase in independent acceptance of most foods. The child's caregiver also favored correspondence training over more traditional applications of differential reinforcement.

Introduction

Avoidant/restrictive food intake disorder (ARFID) describes an eating or feeding disturbance that causes individuals to not meet their daily nutritional or energy needs (American Psychiatric Association, 2013). As a result, these individuals may experience one or more symptoms and fall into one of four categories outlined by the *DSM-5:* Significant weight loss/growth failure (Subtype A1) or nutritional deficiencies (Subtype A2), depend on enteral or oral formula (Subtype A3), and/or experience marked interference with psychosocial functioning (Subtype A4). Much of the research encompassing pediatric feeding disorders is congruent with assessing and treating individuals who are newly captured in the ARFID diagnosis. Present literature suggests ARFID occurs in 4% of young children and children with autism spectrum disorder (ASD) are five times more likely to have a comorbid ARFID diagnosis (Kovacic et al., 2021; Seiverling et al., 2018; Sharp et al., 2013). Researchers propose the higher prevalence in children with ASD is related to shared neurobiological abnormalities in sensory perception between ASD and ARFID, but it should be noted that ARFID can also manifest in the form of a homeostatic appetite (i.e., lowered or lack of physiological cues that drive hunger) and are influenced by negative valence factors (i.e., traumatic experiences from eating, such as choking, vomiting, allergic reactions, or gastrointestinal distress; Thomas et al., 2017).

The majority of treatment research on ARFID and pediatric feeding disorders stems from the applied-behavior-analytic literature dating back to the 1970s (Sharp et al., 2010). Behavioral treatment components to address inappropriate mealtime behavior (i.e., active refusal that occurs prior to the food entering the mouth, including head turning, pushing away the food, and covering of the mouth) with young children most commonly contains escape extinction, differential reinforcement of alternative behavior (DRA), and stimulus fading (Ledford et al.,

2018; Saini et al., 2019; Sharp et al., 2017; Volkert & Piazza, 2012). Behavior analysts often include escape extinction procedures in treatment (e.g., nonremoval of the spoon, physical guidance) to address the hypothesized escape function for inappropriate mealtime behavior (Girolami & Scotti, 2001; Piazza et al., 2003).

Clinicians may avoid prescribing extinction procedures due to unwanted side effects of extinction, including response bursts and response variability (Lerman & Iwata, 1995; Lerman et al., 1999; Trump et al., 2020), the potential for counter-therapeutic effects associated with poor integrity with implementation (Fryling et al., 2012; St Peter Pipkin et al., 2010), or social validity concerns (Tereshko et al., 2021; Vazquez et al., 2019). Preliminary research suggests extinction bursts occur in as many as 40% of cases when a feeder implements nonremoval of the spoon (Woods & Borrero, 2019). Extinguishing inappropriate mealtime behavior may also result in increases in corollary behavior such as expulsion, packing, and negative vocalizations (Sevin et al., 2002). Caregivers may find increases in inappropriate mealtime behavior or other problematic behavior difficult to manage and they may not deem escape extinction as feasible or socially acceptable to implement (Tereshko et al., 2021; Vazquez et al., 2019). Additional strategies such as demand fading or non-contingent access to preferred toys may mitigate adverse behavioral side effects associated with escape extinction (Berth et al., 2019; Sharp et al., 2010).

Differential reinforcement is the most widely used component in behavioral treatment to increase responding that leads to food consumption (Ledford et al., 2018; Sharp et al., 2010; Volkert & Piazza, 2012). Researchers frequently report differentially reinforcing bite acceptance (e.g., Allison et al., 2012; Berth et al., 2019) and mouth clean, an observable response and a product of swallowing (e.g., Patel et al., 2002; Stubbs et al., 2018). Other applications of

differential reinforcement in the mealtime context include drink acceptance (Patel et al., 2001), chewing (Taylor, 2020), bite pacing (Girolami et al., 2009), and self-feeding bites and drinks (Gonzalez et al., 2013; Peterson et al., 2015). In these demonstrations, the feeder delivered reinforcement either after the child engaged in the target response or met a response criterion (e.g., completing all bites/drinks within a 45 min meal). Research also suggests that during post-treatment, caregivers rate differential reinforcement as a socially valid treatment component to address feeding problems and consider DRA to have more social validity than other approaches, including escape extinction (Vazquez et al., 2019).

Some caregivers may be discouraged by the time and effort associated with the ongoing monitoring that is necessary to properly implement DRA. For DRA, proper implementation, as measured by treatment integrity, typically involves delivering a reinforcer contingent on an observable target response occurring and withholding reinforcement when problem behavior occurs (i.e., extinction; St Peter Pipkin et al., 2010). In feeding, therapists may train caregivers to effectively distinguish when their child accepts a bite, by observing the spoon cross the plane of their child's lips and depositing the entire bite into their child's mouth, and to only remove the demand when food smaller than the size of a pea is left on the spoon. Training also frequently includes reviewing operational definitions and identifying response requirements for when to implement additional protocol components (Anderson & McMillan, 2001; Bachmeyer-Lee et al., 2020; Pangborn et al., 2013; Seiverling et al., 2012).

Although preliminary research suggests that outcomes of behavioral treatment for feeding problems may be somewhat resistant to treatment integrity errors with a therapist (Ulloa et al., 2020), periods of renewal or resurgence of inappropriate mealtime behavior may be especially apt to occur during caregiver training due to context changes, a reinforcement history of escape

from the mealtime context, and poor treatment integrity (Ibañez et al., 2019; Ulloa et al., 2020). That is, context changes, such as moving from a therapist feeding to introducing a caregiver as the feeder may result in renewal of inappropriate mealtime behavior (Haney et al., 2021). Resurgence, or the recurrence of problem behavior, may occur only after a target response is placed on extinction, reinforcement is delivered for an alternative response, and reinforcement for the alternative response is thinned or removed (Greer & Shahan, 2019). If a caregiver implements escape extinction but fails to deliver reinforcement contingent on the acceptance of a bite (i.e., an omission error), resurgence may occur, or an increase in inappropriate mealtime behavior. High treatment integrity by caregivers may be essential to observe continued efficacy of behavioral treatment to reduce inappropriate mealtime behavior and increase food acceptance for children with ARFID.

Some caregivers may be less accepting of reinforcement strategies, which could lead to poor treatment integrity (Allen & Warzak, 2000). Despite extensive research that suggests caregivers can use repeated taste exposure and social and tangible rewards to reinforce acceptance of foods that maintains over time, reinforcement strategies remain controversial in part due to popular theories claiming that extrinsic rewards will diminish intrinsic motivation to engage in a response such as eating or trying new foods (Cooke et al., 2011). Children with ARFID may be at an increased likelihood of relying on reinforcement strategies to increase food consumption due to lowered motivation to eat associated with homeostatic appetite, negative valence systems, and sensory perception (Thomas et al., 2017). The disconnect between the efficacy of differential reinforcement and caregiver acceptability of such strategies could be detrimental for children with ARFID who require such treatment.

Say-do correspondence training involves delivering reinforcement when there is a match between verbal behavior and nonverbal behavior (Lloyd, 2002), and preliminary measures of social validity suggest say-do correspondence is socially acceptable for improving school behavior problems (Anderson & Merrett, 1997; Huffman et al., 2016; Noda & Tanaka-Matsumi, 2009; Ruiz-Olivares et al., 2010), play skills (Morrison et al., 2002), and vocational skills (Crouch et al., 1984). Children with ARFID may possess some motivation to eat more foods due to the impact of selective eating on psychosocial functioning, also suggesting say-do correspondence may be a promising area of research in the feeding literature (Taylor et al., 2019). Past researchers used say-do correspondence training to establish and maintain other health-related behavior, including choosing healthy snacks (Baer et al., 1987; Baer et al., 1983; Friedman et al., 1990) and improving personal hygiene (Stokes et al., 2004). Delivering reinforcement for say-do correspondence may be similar in efficacy to reinforcing compliance, generalize to other contexts and responses, and yield improved caregiver acceptability (Jewett & Clark, 1979; Lee & Lee, 2015; Noda & Tanaka-Matsumi, 2009). However, to date, researchers have never evaluated say-do correspondence training with severe feeding problems.

One conceptualization of the vocal statement in a say-do correspondence arrangement is that the individual is engaging in *self-instruction* (Duarte & Baer, 1994). A potential benefit of say-do correspondence is changing behavior in inaccessible settings, such as a caregiver wanting to ensure their child consumes their lunch at school. Caregivers may also wish to establish a plan for future meals, such as asking their child what they will eat tonight for dinner prior to preparing the food. Caregivers may better rely on their child's vocalization or facilitate correspondence outside of the home setting or prior to the meal if the child's nonverbal behavior were to come under the control of their verbal behavior (Israel, 1978).

Say-do correspondence also shares procedural similarities with compliance (e.g., Deacon & Konarski, 1987; Guevremont et al., 1986; Williams & Stokes, 1983). Research suggests a child's vocalization in say-do correspondence training and the therapist's instruction in compliance training may exert similar control over the future probability of a response (Baer et al., 1988; Matthews et al., 1987; Weninger & Baer, 1990). Perhaps more significant is the potential for improved generalized correspondence and maintenance when compared to compliance. The child's attention to their vocalization may enhance the saliency of the contingencies and serve as a generalized response class (Baer, 1990; Ward & Stare, 1990).

In the current study, researchers sought to evaluate if say-do correspondence training led to increases in food consumption for children with ARFID. Specifically, researchers were interested in if say-do correspondence is necessary to increase independent acceptance of food or if a vocal statement to engage in independent acceptance was sufficient. A secondary goal of this study was to assess caregiver social validity on the goals, procedures, and outcomes of say-do correspondence training to address their child's feeding behavior and how acceptable correspondence training procedures compared to the more traditional application of differentially reinforcing bite acceptance.

Method

Recruitment and Eligibility Criteria

The research team conducted a prospective consecutive controlled case series (e.g., Hagopian, 2020), in which the team defined eligibility criteria prior to enrollment, and assessed and recruited participants that met eligibility criteria within an intensive, multidisciplinary day treatment feeding program located in the southeastern United States. Researchers approached children and their caregivers to participate if their child met the following inclusionary criteria:

Child was between the ages of 5- and 12-years old diagnosed with one of four subtypes of ARFID (A2 [nutritional deficiency], A3 [formula dependence], and A4 [psychosocial functioning impairment]), possessed vocal verbal language, participated in a toy and food paired-choice preference assessment, and whose current protocol involved self-feeding without escape extinction. Additionally, children must have exhibited low or variable levels of self-feeding, swallowing, or other forms of completing eating demands (e.g., graduated exposure). Researchers excluded children who met criteria for an ARFID A1 (i.e., failure to gain/maintain weight) diagnosis due to medical severity and the risks associated with attempting a novel approach to treatment and thus delaying evidence-based treatment. Researchers also excluded children who were non-vocal verbal, or whose protocols included escape extinction on the therapist presenting the bites to the child.

Throughout the duration of the study, 66 children were admitted to the intensive, multidisciplinary day treatment feeding program and two met eligibility criteria to participate. Upon meeting eligibility criteria and after discussion with the clinical team about the appropriateness of the study for their patient, a member of the research team approached the child's caregiver and provided verbal and written informed consent. One caregiver did not provide informed consent. If a caregiver consented to participating in the study, a member of the research study team requested verbal assent from their child if they were between the ages of 6- and 10-years old and verbal and written assent if they were between the ages of 11- and 12-years old.

Participant, Setting, and Materials

One child admitted to an intensive, multidisciplinary feeding program participated in the current study. A licensed psychologist referred Samuel, a 6-year-old bi-racial (White and Asian)

male diagnosed with ASD, to the multidisciplinary feeding program for food selectivity by type (A2) and psychosocial impairment (A4). Samuel possessed a body mass index of 15.67 kg/m^2 (56th percentile) at the time of admission. The registered dietician indicated that Samuel's intake was adequate to meet his caloric needs, but he possessed a suboptimal nutrient intake (lower than his dietary reference intake) and relied on a multivitamin to meet his nutrient needs. Samuel placed further restrictions on their variety by limiting consumption to certain brands of food or presentation styles. Samuel consistently consumed a variety of proteins (i.e., bacon, salami, pepperoni, peanut butter sandwich, ham, hamburger, and Chick-fil-A or McDonald's chicken nuggets), grains (i.e., waffles, Krusteaz pancakes, bread, biscuits, Hawaiian rolls, cereal, crackers, spaghetti pasta, French fries, tater tots, and hash browns), snack foods (i.e., Cheez-its, chips, popcorn, gummies), water, soda, and a limited variety of fruit (i.e., apples, applesauce, strawberries) and dairy (i.e., string or sliced cheese), and no vegetables. The speech pathologist observed no oral motor deficits and determined that Samuel was a safe oral feeder with no swallowing concerns. The medical team also ruled out any medical concerns related to eating. Samuel was diagnosed with ASD at 5-years of age. At the time of diagnosis, Samuel scored in the above average range (SS=111, 77th percentile) for verbal reasoning and in the average range (SS=104, 61st percentile) for cognitive ability on the *Differential Ability Scale, 2nd Edition – Early Years, Upper Level.*

A trained therapist conducted sessions in a 3 m x 5 m treatment room that was adjacent to observation room and could be viewed through a one-way observation window. The therapist and Samuel each sat on a chair at a table. On each bite presentation, the therapist presented a plate containing a single bite of food on a large maroon spoon. The therapist had an assortment of toys and DVDs, previously identified in a paired-choice preference assessment at the

beginning of Samuel's admission, for Samuel to choose from as reinforcers. Other session materials included a paper and pencil data sheet, food scale, and napkins.

The research team selected 12 foods that the clinical team was currently targeting with Samuel. These foods included three foods from each food group and were foods that Samuel selected in a paired-choice preference assessment with a bite-size modification that the therapist conducted at the beginning of his admission and originally chosen by his caregiver with input from the registered dietician to best address his gaps in nutrition. The therapist conducted the preference assessment in a format consistent with that described by Fisher et al. (1992), in that one of eight foods within a food group was presented with every other food within the same food group and the child was asked to pick which of two foods they would like to try (e.g., the therapist compared fruits to other fruits but not to foods in other food groups). Once the child selected the food, the therapist cut the food into three sizes (Size 1 = rice-size, Size 2 = ⅛" x ¼" x ¼", Size 3 = ¼" x ¼" x ¼") and again asked the child to select which bite size they would like to try. Samuel's proteins included chicken nuggets, fish sticks, and hot dog. Starches included grits, pasta, and rice. Targeted fruits included pear, pineapple, and strawberry. Vegetables included broccoli, corn, spinach. At the beginning of his admission, Samuel self-fed and swallowed small amounts (i.e., rice-size bolus) of all proteins, starches, and fruit, but required graduated exposure (i.e., systematic exposure to the food that may involve touching to lips, tongue, and chewing, prior to swallowing) to target swallowing of vegetables. The therapist prepared each food by cutting them into pieces that measured ½"x ¼" x ¼" or equaled ¼-level bolus for foods that contained a naturally lower texture (i.e., grits, rice, spinach). The therapist presented two pieces of corn to match the ½"x ¼" x ¼" bite size. Samuel also had free access to

a 5 oz cup of water throughout the meal, as this was consistent with their treatment prior to the evaluation.

Prior to the evaluation, researchers divided the 12 foods into three sets of four foods, each including one protein, starch, fruit, and vegetable. Researcher used data on independent acceptance for each food using their current treatment protocol across four meals prior to beginning the evaluation. They balanced assignment of foods to food sets using rank order scaling method of ordinal data (Appendix A)—a novel approach to assigning each food to one food set. By balancing foods using the rank order scaling method (as opposed to randomization), researchers attempted to distribute foods equally based on an estimated measure of overall response effort. Researchers individually ranked five standard bite sizes (i.e., ½” x ½” x ½”, ½” x ½” x ¼”, ½” x ¼” x ¼”, ¼” x ¼” x ¼”, rice-size) on a scale from 1 (largest) to 5 (smallest) and the participant’s relative performance from 1 (worst) to 3 (best) based on the percentage of bite presentations that the participant engaged in the independent acceptance when presented with each food (Figure 6). Researchers then assigned each food two ranks (one based on the current bite size and one on relative performance) and multiplied these rankings to yield an estimated measure of overall response effort with a higher number indicating less effortful. Researchers assigned new rankings within food groups based on the response effort measure, 1 (high), 2 (moderate), and 3 (low), and attempted to equally distribute one food from each food group among three food sets based on the response effort measure. Sets A and B contained one food considered to be of high response effort, two foods of moderate response effort and one of low response effort. Set C contained two foods of high response effort and two foods of low response effort. Set A contained fish stick, grits, strawberry, and broccoli, Set B contained chicken nuggets, pasta, pear, and spinach, and Set C contained hot dog, rice, pineapple, and corn.

Response Measurement and Data Collection

Researchers, in conjunction with the clinical team, selected independent bite acceptance as the primary dependent variable for Samuel due to variable levels of independent acceptance prior to enrollment in the study. A trained feeding therapist (possessed a minimum of a bachelor's-level degree in psychology and had received systematic training in which the program required that they achieve ≥80% integrity on standardized feeding protocols) implemented all procedures, served as the primary observer, and collected paper and pencil data in vivo on participant behavior using interval recording data collection. Data collectors scored *IVM acceptance* when the participant self-fed and accepted the entire bite into their mouth and indicated if they did so within 5 s of the bite presentation independently (I) or following a vocal prompt (V) or model prompt (M) by the therapist. Data collectors also scored *vocalization* when the participant "set their goal" by vocally stated that they would take the bite independently (i.e., "I am going to take my bite quickly") and *say-do correspondence* if the participant engaged in both the vocalization and independent acceptance on the same bite presentation.

Inter-observer Agreement and Procedural Integrity

The first author served as the secondary observer and collected data independent of the primary observer either in vivo through a one-way observation window or via the video recording system using a paper and pencil data sheet. Inter-observer agreement data were collected on 58% of baseline sessions, 43% of vocalization sessions, and 35% of say-do correspondence sessions. We compared observers' data for each dependent variable within the interval by indicating an agreement among observers if both observers scored either occurrence or non-occurrence and a disagreement if one observer scored occurrence and the other scored non-occurrence. Researchers used these data to calculate trial-by-trial inter-observer agreement

(IOA) by dividing the total number of bite trials with agreement by the summative number of trials with agreement and disagreement and multiplying this quotient by 100. IOA for independent acceptance in baseline, vocalization, and say-do correspondence conditions equaled 88%, 95%, and 91%. IOA for the vocalization equaled 100% across conditions. Researchers scored procedural integrity on the correct and incorrect implementation of all procedures using a checklist (Appendix B). This included conducting the brief toy choice assessment at the beginning of the session, presenting the correct bite size with the 3-step prompting sequence, delivering the programmed consequences (e.g., immediate labelled praise, 30 s access to reinforcer), and ignoring all problematic mealtime behavior (e.g., IMB, negative statements about food) for baseline, vocalization, and say-do sessions. For vocalization sessions, we also included labelling the name of the food, 3-step prompting for the child to emit the vocalization, and removal of a packed bite after 2 min. For the final six say-do sessions for Food Set A and C, and the final eight say-do sessions for Food Set B, we also included moving onto the next bite after 2 min of nonacceptance following a comission error (i.e., reinforcing problem behavior) in which the therapist removed the bite after 2 min of nonacceptance. Researchers scored procedural integrity on therapist behavior for 23% of baseline sessions and 21% of both vocalization and say-do sessions using a checklist outlining the procedures. Researchers calculated procedural integrity by dividing the number of correctly implemented steps by the total number of possible steps to implement procedures and multiplying by 100. Procedural integrity during baseline equaled 98% (range, 91% to 100%), 93% (range, 62% to 100%) for vocalization, and 99% (range, 93% to 100%) for say-do sessions.

Experimental Design and General Procedures

Experimenters evaluated the effects of say-do correspondence training on independent acceptance using a concurrent multiple-baseline design across food sets (i.e., presentation of different sets of foods). Prior to the beginning of the session, the therapist stated the contingencies with a corresponding color card that the therapist placed within the participant's view for the remainder of the session. If the contingencies remained the same across food sets in the same 40-min meal session, the therapist did not restate the contingencies and the same color card remained within the participant's view. If the therapist changed the contingencies for one or more food sets but not the other(s), the therapist stated the contingencies and changed the color card prior to beginning the session in which the contingency change occurred by removing the old color card from the participant's view and replacing it with the new color card. The therapist also conducted a brief toy choice assessment by providing the participant a choice between two items the child had selected at $\geq$ 50% in the toy paired-choice preference assessment. The therapist used the item the participant selected as the reinforcer for the subsequent 5-bite session and repeated the brief toy choice assessment prior to the beginning of each session in attempts to maintain the reinforcing value of the selected toy and avoid satiation.

At the beginning of each session, the therapist presented a bite on a spoon on a plate in front of the participant using a 3-step prompting procedure. If the participant did not accept the bite independently within 5 s of the bite presentation, the therapist delivered a vocal prompt (i.e., "Take a bite"). If an additional 5 s elapsed without acceptance (i.e., 10 s following the initial bite presentation), the therapist modeled taking a bite for the participant by lifting the spoon to their mouth area and pulling the spoon away in an outward motion. The therapist wore a mask in the session room that prevented them from placing the spoon in their mouth. The therapist provided

brief praise (e.g., “Good job taking your bite quickly!”) and social attention (e.g., high-fives, engaging in conversation unrelated to the meal) contingent on acceptance. The therapist delivered a vocal prompt every 30 s if the participant did not accept the bite. If the participant deposited the entire bite into their mouth and the bite was not outside of the participant’s mouth (i.e., expel), the therapist conducted a mouth clean check 30 s after the initial deposit. The therapist provided brief praise and social attention for mouth clean (i.e., amount of food remaining in the participant’s mouth is the size of the pea or smaller). Had the therapist observed food larger than the size of a pea (i.e., packing), the therapist would have vocally prompted the participant to swallow the bite every 30 s and after 2 min of packing used a rubber coated baby spoon to remove all food from the participant’s mouth before presenting the next bite in the rotation. However, the therapist never observed the participant pack any bites. Each session was comprised of 5 bites in which the therapist rotated through sets A, B, and C. Researchers quasi-randomized sessions using a combination of counterbalancing and randomization of food sets in that the therapist began each series by presenting each food set in a session once at the beginning of the series and randomizing the presentation of the remaining two food sets. The therapist presented the fixed sets of food (one food from each food group) at each 40-min meal.

Experimental Conditions

Baseline

The therapist implemented the general procedures described above and delivered 30 s access to a tangible reinforcer contingent on acceptance either independently or following a verbal or model prompt (i.e., differential reinforcement of IVM acceptance). The therapist implemented baseline procedures with each food set until researchers observed moderate (i.e.,

60% or less for at least three out of four sessions) or highly variable levels of independent acceptance.

Reinforcement of Vocalization (Say)

At the beginning of the session, the therapist signaled the occasion for the vocalization to produce reinforcement by labelling the food prior to presenting the bite (e.g., “Your next bite is chicken nugget.”). The therapist delivered brief praise and 30 s access to a tangible reinforcer contingent on the participant engaging in the vocalization. The therapist used a 3-step prompting procedure beginning with waiting 5 s for the participant to engage in the vocalization independently. If the participant did not engage in the vocalization after 5 s of the therapist labelling the food, the therapist delivered a vocal prompt (i.e., “Set your goal.”). The therapist followed up with a model prompt (i.e., “Say, ‘I’m going to take my bite quickly.’”) 10 s after labelling the food if the participant still did not engage in the vocalization. If the participant had not engaged in the vocalization 5 s following the model prompt, the therapist would present the target bite using the general procedures described above; however, the participant engaged in the vocalization on every trial. After the participant engaged in the vocalization, the therapist implemented the general procedures as described above but no longer delivered reinforcement contingent on IVM acceptance. The therapist first implemented the following procedures for the food set with the lowest levels of independent acceptance during baseline (Food Set A) because clinically, this food set was the most problematic. The therapist introduced this condition to subsequent food sets after observing an intervention effect on Food Set A.

Reinforcement of Say-do Correspondence

The therapist implemented procedures identical to the reinforcement of vocalization condition, except that they delivered brief praise and 30 s access to a tangible reinforcer

contingent on say-do correspondence, meaning that the participant engaged in both the vocalization and independent acceptance. The therapist implemented say-do correspondence procedures following low levels of independent acceptance during reinforcement of vocalization for Food Set A, and sequentially implemented these contingencies following moderate or variable levels of independent acceptance for Food Set B and Food Set C. Upon introducing reinforcement of say-do correspondence for Food Set C, the participant refused to self-feed the vegetable for the remainder of the 40-min meal. The therapist implemented a move-on rule across food sets at the following meal, in that after 2 min of non-acceptance, the therapist removed the bite (i.e., escape) and presented the next bite in the rotation.

Social Validity

The research team administered two surveys to the participant's caregiver to assess the goals, procedures, outcomes, and preference for say-do correspondence training (Kazdin, 1977; Wolf, 1978). The research team administered the pre-treatment survey (Appendix C) to the caregiver prior to the beginning of the evaluation. The pre-treatment survey was a semi-structured survey comprised of an open-ended question about caregiver goals for the participant's admission as well as two 5-point Likert-type scales. The first Likert-type scale assessed for the caregiver's impression of the severity of their child's feeding problem and ranged from a score of 1 (Very Mild) to 5 (Extremely Severe). The second Likert-type scale assessed caregiver motivation to implement treatment and ranged from a score of 1 (Not Motivated at All) to 5 (Extremely Motivated).

Researchers administered the post-treatment survey (Appendix D) to the caregiver after the team completed the evaluation. The post-treatment survey contained questions asking the caregiver about acceptability and feasibility of all say-do correspondence training procedures and

four 5-point Likert-type scales. Specifically, the caregiver indicated what procedures they liked, felt neutral about, or disliked, and whether they perceived the procedure to be easy, neutral, or difficult to implement. The first and second Likert-type scales assessed the outcomes of say-do correspondence training, asking the extent to which the caregiver observed improvement in their child's eating and likelihood that they would recommend this intervention for other children. The second and third Likert-type scales assessed acceptability and recommendation of the intervention compared to baseline procedures.

Results

The mean percentage of trials with independent acceptance by food prior to enrollment in the study are graphed in Figure 6. Independent acceptance varied across foods and food groups (M = 30.0%, range: 6%-72%). Mean independent acceptance for each food set were as follows: Food Set A (M = 29.0%), Food Set B (M = 28.8%), and Food Set C (M = 33.0%).

The percentage of trials with independent acceptance are charted for visual analysis in Figure 7. During baseline, Samuel engaged in moderate to low levels of independent acceptance when presented with foods in Food Set A (M = 46.7%, range: 20%-60%). Upon introducing reinforcement of vocalization, independent acceptance increased initially but then dropped to low levels for Food Set A (M = 40.0%, range: 20%-80%). Samuel's independent acceptance increased to high levels when the therapist implemented reinforcement for say-do correspondence (M = 93.9, range: 60%-100%). Independent acceptance remained variable with Food Set B (M = 52.5%, range: 20-80%) and Food Set C (M = 62.7%, range: 40%-80%) during baseline. Researchers observed a slight increase in independent acceptance upon introduction of reinforcement of the vocalization for Food Set B (M = 75.6, range: 60%-100%), but not for Food Set C (M = 68.6, range: 40%-80%). Independent acceptance increased slightly for Food Set B (M

= 76.9, range: 40%-100%) and Food Set C (*M* = 73.6, range: 60%-80%), and reduced in variability for Food Set B upon establishing reinforcement of say-do correspondence.

Samuel refused to self-feed vegetables periodically throughout the evaluation and had a history of not swallowing foods from this food group. Thus, researchers were interested in the effects of say-do correspondence training without this food group and retrospectively re-analyzed independent acceptance with vegetable data removed, as seen in Figure 8. Researchers observed similar variability but overall higher levels of independent acceptance across food sets with vegetable data removed. Baseline data were variable for Food Set A (*M* = 58.3%, range: 25%-75%) and Food Set B (*M* = 53.1%, range: 25%-75%) and moderate to high for Food Set C (*M* = 76.7%, range: 50%-100%). We did not observe an increase in independent acceptance when the therapist delivered reinforcement for vocalization for Food Set A (*M* = 50.0%, range: 25%-100%) and only a slight increase for Food Set B (*M* = 80.6%, range: 50%-100%) and Food Set C (*M* = 85.7%, range: 50%-100%). Upon implementation of reinforcement for say-do correspondence, we observed increases in independent acceptance to high levels for Food Set A (*M* = 94.6%, range: 50%-100%) and an overall decrease in variability across Food Set B (*M* = 96.2%, range: 50%-100%) and Food Set C (*M* = 92.9%, range: 75%-100%).

Prior to the beginning of the evaluation, Samuel's caregiver indicated their goals for admission included increasing the variety of foods, especially fruits and vegetables, that Samuel would accept and increasing independence during meals without technology. She rated the severity of Samuel's eating problems as moderate to severe (Score = 3.5) and indicated that she was extremely motivated to implement his treatment (Score = 5).

Following the completion of the evaluation, Samuel's caregiver indicated liking all procedures and found 3-step prompting, providing attention for positive behaviors, reinforcing

goal setting for eating (i.e., the vocalization or say response), and reinforcing goal setting and follow through for eating as easy to implement. She reported that minimizing attention for negative behaviors may be more difficult. Samuel's caregiver rated the outcomes of say-do correspondence training as improved (Score = 4) and indicated that she would recommend this treatment for other children (Score = 5). When compared to baseline procedures (i.e., delivering reinforcement for accepting the bite independently or following a verbal or model prompt), she rated say-do correspondence training as more acceptable (Score = 4) and indicated that she would be equally likely to recommend this treatment for other children (Score = 3). Following completion of the study, the clinical team asked Samuel's caregiver if she would like to keep any say-do correspondence training procedures in Samuel's eating treatment. She expressed a desire to continue to incorporate goal setting and follow-through for eating following the evaluation.

Discussion

The current study evaluated the efficacy and social validity of say-do correspondence training to increase mealtime independence for one child diagnosed with ARFID and ASD. Our findings indicate that although independent acceptance increased substantially for one food set, we observed only moderate increases and reductions in variability for the other two food sets. Researchers also assessed caregiver impression of the significance of the goals and outcomes, acceptability and perceived feasibility of the procedures, and preference for say-do correspondence training compared to the baseline treatment (i.e., DRA for IVM acceptance). Samuel's caregiver indicated that increased independence aligned with her goals of his admission, she found the procedures to be socially acceptable and perceived most procedures to be feasible to implement. His caregiver also reported preferring say-do correspondence over differentially reinforcing acceptance of bites.

Samuel's independent acceptance increased overall but did so to a greater degree when we did not account for vegetables. Given Samuel's eating history and referral concern of eliminating all vegetables from his variety, vegetables may have possessed more aversive properties than the other foods we targeted in the evaluation. When presented with a choice between earning a reinforcer for independent acceptance and not accepting a bite of vegetable, the value of the reinforcer that Samuel had selected did not always compete the response effort and potential aversiveness of self-feeding vegetables. It should also be noted that a therapist error occurred on Food Set C during the reinforcement of vocalization phase in which the therapist removed a bite of corn (i.e., commission error) after Samuel refused to self-feed for 2 min. For the remainder of the evaluation, he refused to self-feed corn and the research team added in a 2-min move-on rule to continue presenting bites of the remainder of the foods. We also observed this response carry into Food Set B with spinach, suggesting Samuel learned to wait 2 min for the therapist to remove the bite to avoid eating two of his three vegetables. Contrary to prior research that suggested behavioral interventions for feeding may be robust enough to protect again treatment integrity errors (Ulloa et al., 2020), commission errors appeared detrimental to treatment for this participant (St Peter Pipkin et al., 2010).

This is the first study that we are aware of to use a combined rank of the bite size and relative performance of a target response for attempting to distribute stimuli equally among sets for the multiple-baseline evaluation. In the present study, we conceptualized this as a measure of response effort. However, response effort is multidimensional and may be measured in terms of force, duration, probability, rate, accuracy, etc. (Friman & Poling, 1995). Future researchers may look to replicate or extend measurement approaches to balancing attributes or parameters of stimuli.

We did not evaluate whether differentially reinforcing independent acceptance would have increased independence more efficiently or to a greater extent than say-do correspondence training. Future research may compare correspondence and compliance in the context of feeding to assess if the comparison yields similar findings to prior studies (e.g., Baer et al., 1988; Deacon & Konarski, 1987; Ward & Stare, 1990; Weninger & Baer, 1990). This may have, in turn, affected caregiver social acceptability and preferences if differentially reinforcing independent acceptance yielded increased independent acceptance relative to say-do correspondence training. However, Samuel's mother indicated that she liked the vocalization piece of the intervention and expressed a desire to keep this component in his feeding protocol following completion of the evaluation.

We may have observed stimulus generalization with Food Set B when the therapist implemented reinforcement of say-do correspondence for Food Set A. Levels of independent acceptance on Food Set B were higher during the reinforcement of vocalization phase but overall, still variable. Only until we introduced reinforcement of say-do correspondence did variability decrease, and independent acceptance increased to high levels. Researchers did not evaluate generalization of say-do correspondence to other contexts or responses. If say-do correspondence serves as a generalized response class, we may expect that Samuel would engage in say-do correspondence in other demand contexts, such as completing chores at home or homework for school, but we did not assess for such generalization.

Future research may evaluate the effects of postponing the opportunity for correspondence to produce a reinforcer for a pre-specified amount of time or confined to a pre-determined range of time that does not immediately follow the vocalization on say-do correspondence (Weninger & Baer, 1990). In the current study, the therapist provided Samuel

with the opportunity to engage in say-do correspondence by presenting the bite immediately following the vocalization. It is unclear if Samuel would have engaged in say-do correspondence training if the therapist delayed the bite presentation or if the therapist left the room. If a predominant goal of say-do correspondence and self-instruction is to influence behavior in the absence of a behavior-change agent by establishing verbal control over nonverbal behavior, then having confidence that the individual will emit the target response following a delay in time and in the absence of the behavior-change agent is crucial (Israel, 1978).

Similar to past research (see Bevill-Davis et al., 2004 for a review), we used reinforcement of vocalization and an experimenter-selected target as a control condition to assess if correspondence occurred in the absence of reinforcement for correspondence. Although we evaluated choice in the initial paired-choice preference assessment, future researcher may further incorporate choice so that children select the content of their own vocalizations (e.g., Wilson et al., 1992), which may enhance the probability of observing correspondence. For example, Taylor et al. (2019) allowed the participant to select foods that she consumed in meals and attempted to bias responding toward consumption of foods that were lower in preference by increasing the magnitude of reinforcement.

We conclude that say-do correspondence training may be a viable alternative to traditional applications of differential reinforcement both in terms of efficacy and social validity. This research attempted to build upon existing research by extending say-do correspondence training to a novel application within feeding disorders as well as address the large absence of social validity assessment in the correspondence training literature. As we only had one participant, direct and systematic replications are needed to determine if say-do correspondence training is an effective treatment for address mealtime problems for children with ARFID.

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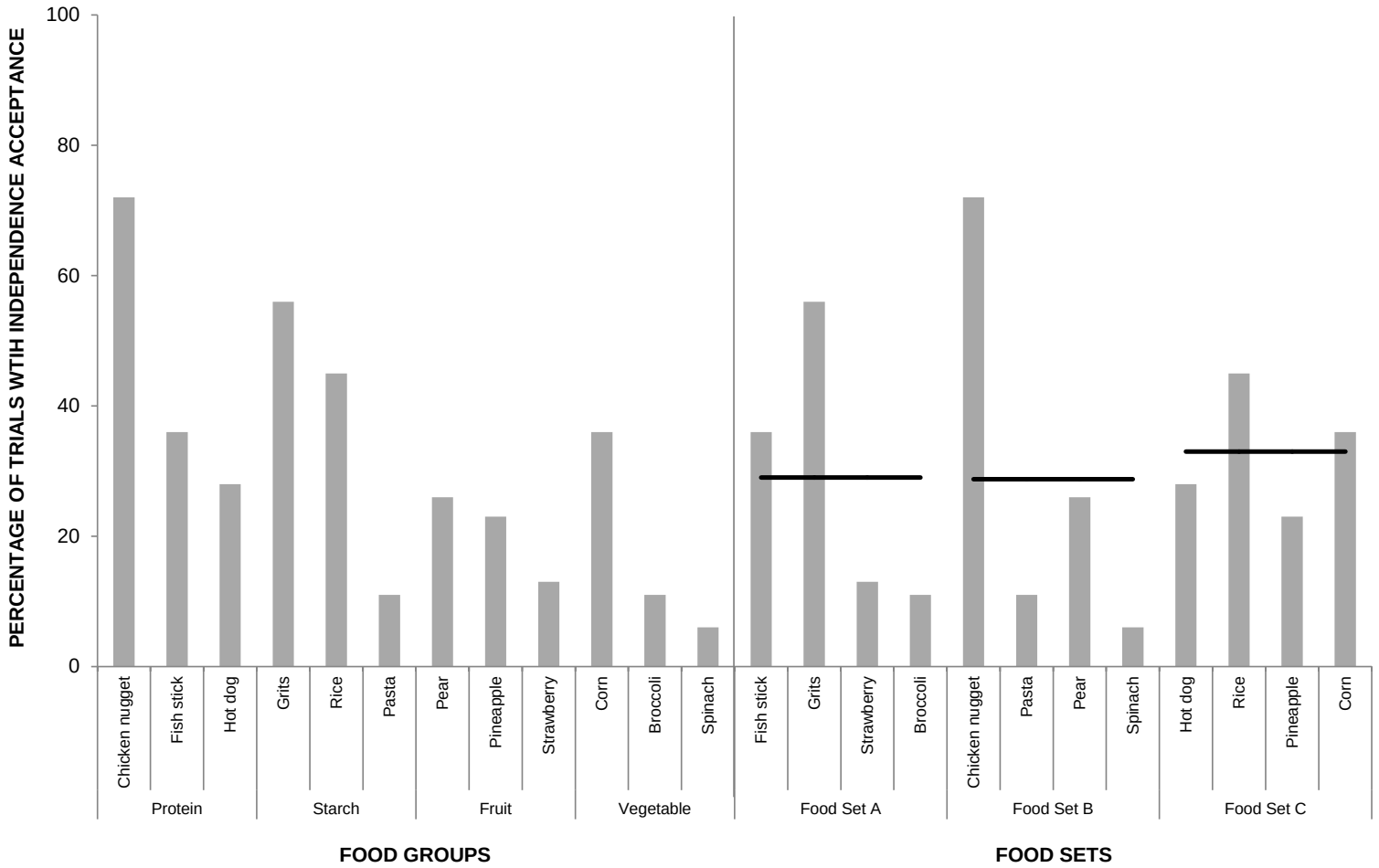
Figure 6.

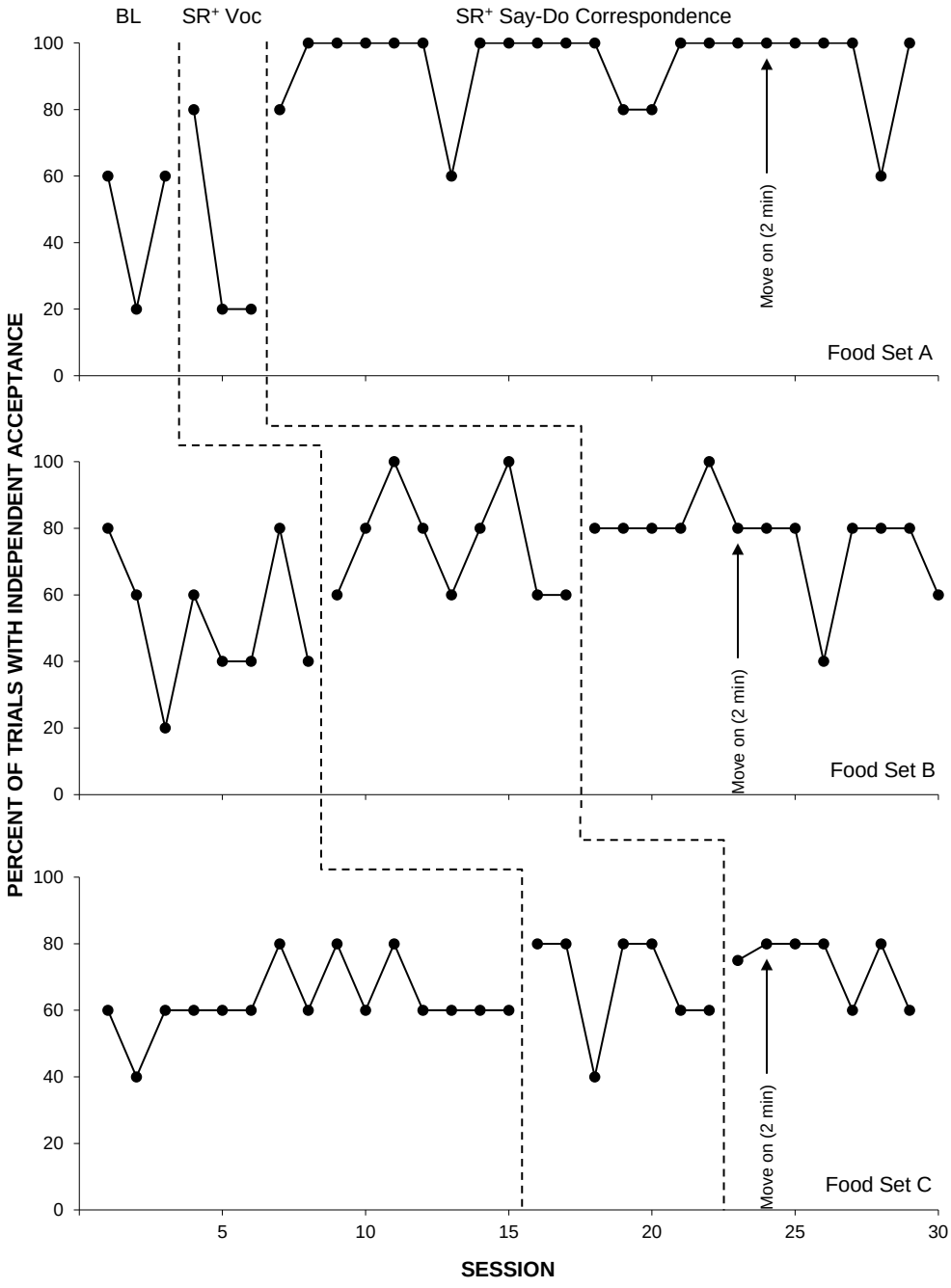
Percentage of Trials with Independent Acceptance Prior to the Evaluation



Note: For all 12 foods and experimenter-developed balanced food sets prior to the evaluation. Black bars indicate mean percentage across foods assigned to each food set after balancing.

Figure 7.

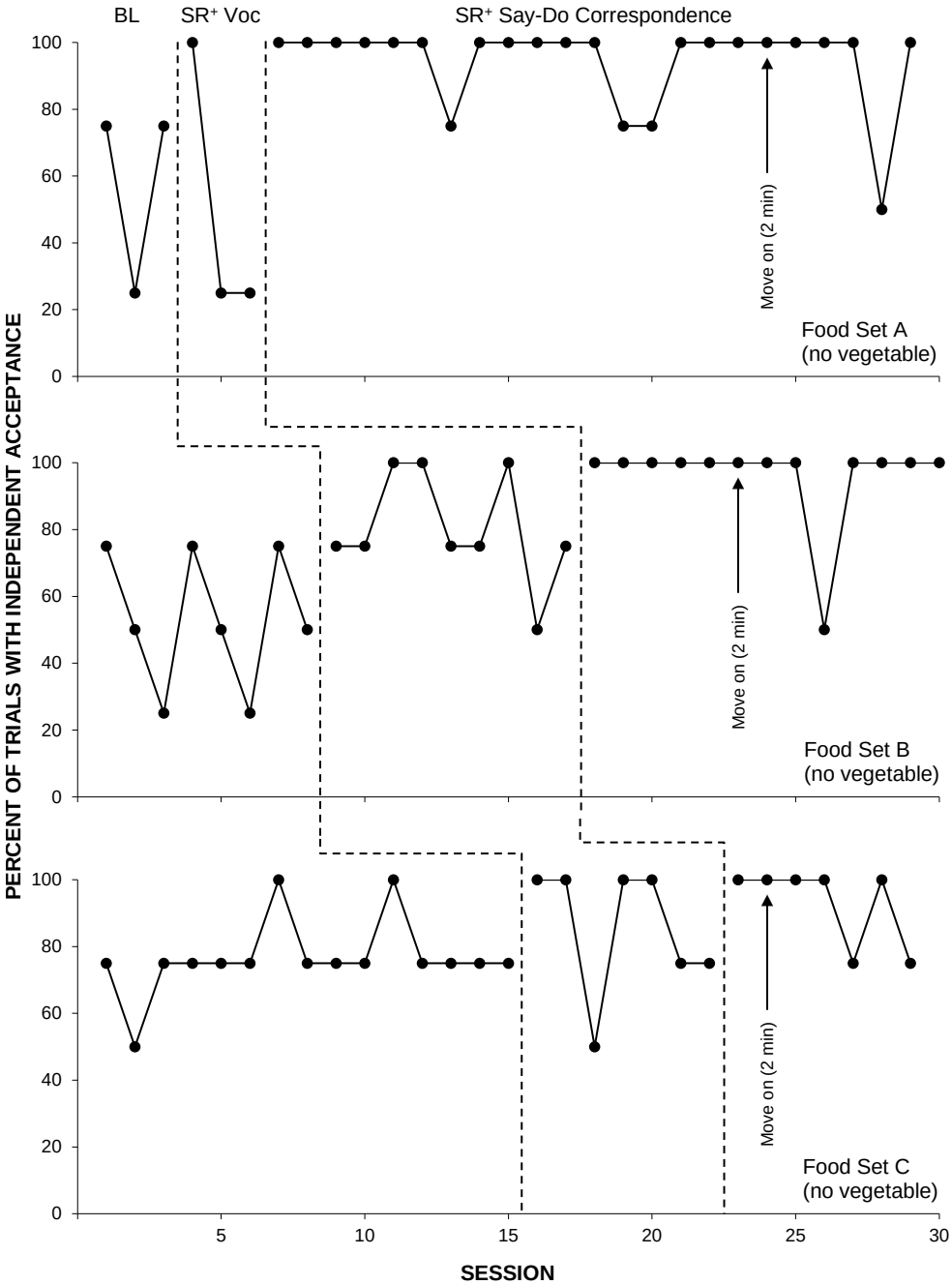
Percentage of Trials with Independent Acceptance Across Three Food Sets



Note: Baseline (BL), reinforcement of vocalization (SR^+ Voc), and reinforcement of say-do correspondence (SR^+ Say-Do Correspondence)

Figure 8.

Percentage of Trials with Independent Acceptance Across Three Food Sets with Trials with Vegetables Removed



Note: Baseline (BL), reinforcement of vocalization (SR^+ Voc), and reinforcement of say-do correspondence (SR^+ Say-Do Correspondence)

CHAPTER 4

GENERAL DISCUSSION

The idiomatic expression, “talk is cheap”, is used to describe situations in which it is easier to say something than follow through with action. Say-do correspondence training describes one method to connect verbal behavior with matching nonverbal behavior. Correspondence training appeared to peak in the 1980s and has declined in numbers of publications and quality since the 1990s. This two-part dissertation extended correspondence training research by systematically evaluating the existing research and using say-do correspondence training to improve mealtime independence. The study in Chapter 3 extended the correspondence training literature and address existing weaknesses identified in the literature review in Chapter 2.

Review of Chapter 2

The review in Chapter 2 built upon existing correspondence training reviews by identifying experimental evaluations that reported quality and breadth of measurement and demonstrated experimental rigor. The aims were to specify existing procedural variations in the published correspondence training literature, yield conclusions from only the high-quality evaluations, as not all experimental research is created equal, and highlight current limitations and areas for future research.

Our review of the literature revealed that the say-do procedure continues to reflect the majority of correspondence training research, a finding that was noted in past literature reviews (Baer, 1990; Bevill-Davis et al., 2004; Lloyd, 2002). The body of literature is generally lacking

in terms of quality and rigor. We discovered only 20% of single case evaluations contained high-quality evidence and researchers across all correspondence training studies neglected to report assessment of procedural integrity and social validity as well as provide sufficient data to demonstrate an effect. Additionally, researchers typically failed to report race/ethnicity and socioeconomic status of participants.

Of the high-quality research available, we sought to answer the questions, what procedures reliably work, for whom do they work for, and under what conditions. Our review revealed positive effects for say-do, do-say, say-do-report, and intermediate behavior procedures. Procedures were used effectively with both groups of students and individuals, most of whom were male, 12 years of age or younger, White, middle class, and were diagnosed with a neurodevelopmental disorder. Correspondence training procedures were most frequently carried out in early childhood and primary educational settings to improve leisure activities by experimenters who served as behavior-change agents.

Review of Chapter 3

Chapter 3 presents a study that used a concurrent multiple baseline design across food sets to assess the effects of say-do correspondence on independent self-feeding—a novel application in the say-do correspondence literature. Prior to the evaluation, the participant engaged in low to moderate levels of independent acceptance. We equally distributed foods across food sets based on response effort (a combined measure of bite size and relative performance) using a rank order scaling method and sequentially introduced treatment by staggering baseline, reinforcement of vocalization, and reinforcement of say-do correspondence conditions across food sets. Baseline independent acceptance was variable across food sets. Reinforcement of vocalization did not increase independent acceptance for Food Set A or Food

Set C, but did so to a moderate degree for Food Set B. We observed large increases in independent acceptance for Food Set A and moderate increases for the other two food sets.

We assessed for caregiver social validity of the goals, procedures, and outcomes at the beginning and end of the evaluation. The participant's caregiver rated say-do correspondence training as a socially valid treatment to increase independent acceptance and expressed a preference for say-do correspondence over reinforcing acceptance. Our results support previous findings suggesting that stakeholders consider say-do correspondence training to be socially valid (Anderson & Merrett, 1997; Crouch et al., 1984; Huffman et al., 2016; Morrison et al., 2002; Noda & Tanaka-Matsumi, 2009; Ruiz-Olivares et al., 2010).

Limitations

Several limitations in Chapter 2 and Chapter 3 exist. Our review in Chapter 2 did not distinguish between methods used by researchers to assess for maintenance. Thus, it is currently unclear if certain correspondence training procedures may have promoted maintenance or lead to maintenance failure. We also did not code for the presence of additional treatment procedures when correspondence training was a part of a larger treatment package with multiple components, thus, limiting our understanding of conditions in which correspondence training is efficacious alone or with other commonly prescribed treatment procedures.

The study in Chapter 3 demonstrated weak experimental control potentially due to treatment integrity errors and stimulus generalization. The therapist committed an error of commission that may have unintentionally increased the future probability that the participant refused to self-feed vegetables, and we observed stimulus generalization with one food set. We did not assess for response generalization. We also do not know if say-do correspondence was more efficacious than reinforcing independent acceptance, as this was not evaluated.

Future Directions

Perhaps the most apparent area of future research would be to develop and evaluate methods to help with programming for generalization and maintenance. Although several researchers highlight that generalized correspondence is a top priority in correspondence training research due to the ability to change behavior in inaccessible contexts, few studies reported this (Bevill-Davis et al., 2004; Israel, 1978; Lloyd, 2002). Programming for generalization and maintenance may involve: (a) delivering intermittent reinforcement or making contingencies discriminable (Baer et al., 1987; Guevremont et al., 1986b), (b) training using multiple exemplars (Ralph & Birnbrauer, 1986), (c) systematic thinning of reinforcement (Luciano-Soriano et al., 2000), (d) delaying reinforcement (Baer et al., 1983; Callicott & Park, 2003; Whitman et al., 1982), and/or (e) training say-do correspondence using time delays (i.e., time between the vocalization and the opportunity to engage in a corresponding nonverbal response) and/or across settings (Baer et al., 1983; Guevremont et al., 1986a; Jewett & Clark, 1979). Additionally, although evaluations were primarily conducted in participants' educational settings, researchers could further improve external validity by developing and assessing the efficacy of teacher or caregiver-mediated protocols to teach verbal-nonverbal relations (Ledford & Gast, 2014; Noda & Tanaka-Matsumi, 2009; Ruiz-Olivares et al., 2010; Stocco et al., 2021).

Future researchers may consider applying say-do correspondence to more meaningful, or socially significant behavior. Researchers targeted leisure skills (i.e., play) most frequently when teaching correspondence, potentially due to the average age of participants or because play is relatively low stakes. However, researchers ought to apply say-do correspondence to behavior that is of cultural importance. More recent and novel applications include studying lying and honesty (Sauter et al., 2020; Stocco et al., 2021), self-grading and self-assessment (Cortez et al.,

2014; Domeniconi et al., 2014), improving posture and back health (Noda & Tanaka-Matsumi, 2009), and in the current study, independence during meals.

Behavior analysts may even seek to expand our conceptualization from that of words and deeds to values and actions. Bonow and Follette (2009) proposed that values may be reflected through (a) a continuous pattern of responding (referred to as *valuing*) such as always following through with what you said you would do, (b) engaging in repeated behavior to achieve some goal (referred to as *functional values*), or (c) making verbal statements about either of these (e.g., "It's important to keep promises" or "I should exercise"). Value-based action is another perspective stemming from acceptance and commitment therapy in which the individual commits to behaving in ways that connect with their values (Hayes et al., 2012). Responses could range from taking the stairs because one values their cardiovascular health to protesting racial injustice in relation to valuing social justice reform. From this perspective, individuals construct verbal repertoires (i.e., values) surrounding behavior or events that serve to functionally control nonverbal behavior and those values establish built-in reinforcers that maintain continued action (Da Silva Ferreira et al., 2020).

Research on say-do correspondence training has decreased at alarming rates given the capacity for this procedure to tackle socially significant behavior change and improve the social validity of behavior-analytic treatment from relevant stakeholders. More recent research appears to have embedded say-do correspondence into contextual behavioral science, potentially alluding to a promising future for this procedure. Research on verbal-nonverbal relations overlap with other largely understudied areas within behavior analysis, including concepts of the self and private events, and may be a safe starting point for researchers new to covert behavior.

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Appendix A

Bite Size by Rank

Rank (Largest to Smallest)	Bite Size
1	1/2"x1/2"x1/2"
2	1/2"x1/2"x1/4"
3	1/2"x1/4"x1/4"
4	1/4"x1/4"x1/4"
5	Rice size

Relative Performance by Rank

Rank (Worst to Best)	Relative Performance (% Target Response)*
1	20
2	40
3	60

*Fabricated data included for example

Example of Food Group (Fruit) Rankings

Fruit	Rank (Bite Size)	Rank (Relative Performance)	Multiplicative	Rank (Response Effort)
Apple	2 (1/2”x1/2”x1/4)	2 (40)	4	1 (High)
Banana	5 (Rice size)	1 (20)	5	2 (Moderate)
Peach	4 (1/4”x1/4”x1/4”)	3 (60)	12	3 (Low)

Food Sets with Response Effort Measure

Set	Protein	Starch	Fruit	Vegetable
A	High	Moderate	Moderate	Low
B	Moderate	Low	High	Moderate
C	Low	High	Low	High

Appendix B

Procedural Integrity Data Sheet

Child: _______ Date: ___________ Feeder:__________ Data Collector: __________ Meal Block: ☐Meal #1 ☐Meal #2 ☐Meal #3 ☐Meal #4

Protocol: ____ Comments:______________________________________

= Correct / (Correct + Incorrect) * 100	**Bite #**	A1 Toy choice	A2 Correct bolus size	A3 Bite instruction (no prompt)	A4 5s verbal prompt	A5 10s model prompt	A6 30s verbal prompt	A7 30s mouth clean check	A8 30s swallow prompt	A9 Labelled praise	A10 30 s DRA	A11 Ignore PBx	B1 SD for Say	B2 5s verbal prompt	B3 10 s model prompt	B4 2min bite removal	C1 2min move on
%	1.																
%	2.	NA															
%	3.	NA															
%	4.	NA															
%	5.	NA															
%	Average for Session # _________																
%	1.																
%	2.	NA															
%	3.	NA															
%	4.	NA															
%	5.	NA															
%	Average for Session # _________																
%	1.																
%	2.	NA															
%	3.	NA															
%	4.	NA															
%	5.	NA															
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%	3.	NA															
%	4.	NA															
%	5.	NA															
%	Average for Session # _________																
%	1.																
%	2.	NA															
%	3.	NA															
%	4.	NA															
%	5.	NA															
%	Average for Session # _________																
%	1.																
%	2.	NA															
%	3.	NA															
%	4.	NA															
%	5.	NA															
%	Average for Session # _________																

BL = A1-11; DRA(Say) and DRA(Say-Do) = A1-11, B1-B4 (+C1 after session 23 for Set C and session 24 for Sets A and B)

Appendix C

Caregiver Pre-treatment Survey

Please answer the following questions regarding your goals for your child's treatment.

1) What eating improvements do you want to see in your child as a result of treatment?

_____
_____
_____
_____

2) In your opinion, how severe are your child's eating problems?

Very Mild		Moderate		Extremely Severe
1	2	3	4	5

3) How motivated are you to implement treatment for your child's eating?

Not Motivated At All		Somewhat Motivated		Extremely Motivated
1	2	3	4	5

Additional Comments:

_____
_____
_____
_____

Appendix D

Caregiver Post-treatment Survey

Please answer the following questions regarding the treatment approach(es) used to treat your child and outcomes of the treatment(s).

1) Which aspects of the treatment did you like or dislike? Why?

Like	Neutral	Dislike	
☐	☐	☐	3-Step prompting
☐	☐	☐	Providing attention for positive behaviors
☐	☐	☐	Minimizing attention for negative behaviors
☐	☐	☐	Reinforcing goal setting for eating
☐	☐	☐	Reinforcing goal setting *and* follow through for eating (if applicable)

_____

_____

2) Which aspects of the treatment do you think would be the easiest or most difficult for you to implement? Why?

Easy	Neutral	Hard	
☐	☐	☐	3-Step prompting
☐	☐	☐	Providing attention for positive behaviors
☐	☐	☐	Minimizing attention for negative behaviors
☐	☐	☐	Reinforcing goal setting for eating
☐	☐	☐	Reinforcing goal setting *and* follow through for eating (if applicable)

_____

_____

3) How do you feel this treatment changed your child's eating?

Got Much Worse		Stayed the Same		Improved Greatly
1	2	3	4	5

4) Would you recommend this treatment for other children?

Not Recommend		May Recommend		Would Recommend
1	2	3	4	5

Video: You will see a video of another strategy that is more commonly used and involves directly reinforcing eating.

5) **Video:** How acceptable is this treatment to you compared to the one your child received?

Less Acceptable		Equally As Acceptable		More Acceptable
1	2	3	4	5

6) **Video:** How likely would you recommend this treatment compared to the one your child received?

Not Likely		Equally Likely		More Likely
1	2	3	4	5

Additional Comments:

_____

_____