

THE EFFECTS OF ADVANCE NOTICE ON TRANSITIONS IN
PRESCHOOL STUDENTS WITH DEVELOPMENTAL
DISABILITIES

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ABSTRACT

Advance notice, a warning of an upcoming demand or transition, is a common antecedent intervention used to reduce problem behavior and to increase compliance in educational settings. However, research conducted in the past decade has failed to uphold the efficacy of advance notice with either typically developing or developmentally disabled children. This study analyzed the frequency of noncompliance and problem behavior associated with transitions in two preschool children diagnosed with Autism Spectrum Disorder by applying advance notice, guided compliance and social praise, and advance notice combined with guided compliance and social praise during consecutive treatment phases. Compliance increased for all participants during phases including an advance notice component; however, problem behaviors increased as well, suggesting that while advance notice may increase compliance for some learners, it may also occasion problem behaviors.

Keywords: Advance notice, transitions, noncompliance, autism spectrum disorder, academic behavior

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CHAPTER 1

INTRODUCTION

Environmental modifications can increase inclusion in less restrictive environments, as well as the amount of time students can access their educational environment. Antecedent strategies are one example that can be used to reduce problem behaviors and increase compliance with the instruction to transition. Transitions are a common occurrence in educational settings. For students with autism spectrum disorder (ASD), the end of one activity and the beginning of a new one may occasion problem behavior (Flannery & Horner, 1994). One common, easily implemented antecedent intervention is advance notice, which gives the student a warning or signal that the transition will occur in a fixed amount of time. However, the current body of literature suggests that advance notice does not necessarily control behavior in the absence of a consequent intervention.

The case for advance notice began with Flannery and Horner's 1994 study, which was based on the premise that unpredictability occasioned problem behavior in students with severe disabilities. Therefore, the presentation of a signal that increased the predictability of an impending change in the environment was found to increase compliance and reduce escape-motivated behavior associated with the change. To demonstrate this, they measured the rate of problem behaviors exhibited by a 14-year-old male with ASD when given familiar and unfamiliar tasks across predictable and unpredictable contexts. During predictability phases, the instructor described and modeled all steps of the task before giving the participant the signal to begin, whereas

during baseline, the instructor only gave the signal to begin. Problem behaviors were ignored and redirection was provided when necessary for the participant to complete the task. Across every task, familiar and unfamiliar, problem behaviors decreased significantly during the predictability phases. Flannery and Horner recommended that teachers incorporate and exaggerate signals regarding the sequence of daily events in order to develop inclusive and individualized programming for special needs students (more recommendations for arranging a predictable educational environment are outlined in Flannery, O'Neill, and Horner, 1995).

These findings preceded research the following year that found advance notice of an upcoming choice to transition from a preferred to a less-preferred activity reduced stereotypic behavior and increased task compliance of an adult with ASD (Tustin, 1995). In this study, an "immediate change" phase in which the participant was asked if he would like to change tasks, whereupon the old materials would be removed and the new materials would be presented, was contrasted against an advance notice phase in which the participant was told he would be switching tasks soon and given two minutes in proximity to the new materials before the old ones were removed. If the participant began the new task, he received verbal praise; if he did not begin the new task or if he engaged in stereotypy, no consequences were delivered. The participant complied in 90% of advance notice trials as opposed to 60% of immediate change trials, and stereotypy occurred at a significantly lower rate during the advance notice phases as well.

Both of these studies are cited as justification for advance notice in research conducted across the last 20 years. However, this research indicates that advance notice is only effective when extinction and reinforcement are implemented as a consequence; no study has indicated that advance notice presented as an antecedent event and only social praise as a consequence, as in Tustin's study, has been effective in either increasing compliance or reducing problem behavior in the absence of a functional analysis. Perhaps for the single participant in Tustin's study, unpredictability was the controlling factor for the stereotypic behavior displayed—but without a functional analysis, larger sample size, or intensive analysis, it's not possible to draw solid conclusions.

Additional research in the following years indicated that the use of advance notice in academic settings to increase compliance and decrease problem behavior was only effective when paired with escape extinction (Cote, Thompson, & McKerchar, 2005), escape extinction and noncontingent reinforcement (Mace, Shapiro, & Mace, 1998), or a combination of escape extinction, differential reinforcement of an alternate behavior (DRA), and response blocking (McCord, Thomson, & Iwata, 2001). These studies found no increase in compliance or reduction in problem behavior during treatment phases consisting of only advance notice with no option to choose to initiate the task. Further research on advance notice over the last dozen years is consistent with those findings. Wilder, Chen, Atwell, Pritchard and Weinstein (2006) found that advance notice alone had no effect on reducing tantrums in preschoolers during the termination of a preferred

activity and the beginning of a non-preferred activity, whereas advance notice paired with differential reinforcement of other behavior (DRO) and extinction were highly effective.

Subsequent studies indicated that advance notice was ineffective in increasing compliance and extinction was necessary to improve compliance (Wilder, Zonneveld, Harris, Marcus, & Reagan, 2007), and that advance notice might have the unintended effect of occasioning problem behavior (Wilder, Nicholson, & Allison, 2010). Although the authors of the latter study did not conjecture as to why problem behavior (specifically, yelling when the warning signal was given that a preferred toy would be taken away in 2 minutes), it's likely that in these cases, as well as the research cited above, advance notice functioned as a reflexive-conditioned motivating operation (CMO-R). In the same way that a warning signal consistently delivered before an electrical shock occasions the escape-maintained behavior of an organism (Michael, 1993), the aforementioned research paired advance notice with worsening conditions (i.e., the termination of a preferred activity and the initiation of a non-preferred activity). When viewed in this context, it follows that there would be no increase in compliance, but with an increase in escape-motivated problem behavior.

Brewer, Strickland-Cohen, Dotson, and Williams (2014) provided a comprehensive review of advance notice and developed practice guidelines to determine the appropriateness of its clinical implementation. This article suggests that the discrepant findings may not suggest that advance notice is ineffective, but instead provide evidence for the conditions under which advance notice is ineffective. All of the studies that

reported negative results (indicating that advance notice did not reduce problem behaviors during transitions) shared a common feature—they did not allow the participant any semblance of choice. The ability to choose may have the effect of abolishing the CMO-R and reducing the momentary value of escape-maintained behaviors (Carbone, Morgenstern, Zecchin-Tiri, & Kolberg, 2010).

Only one study found that a 2-minute warning and timer were effective in reducing the escape-maintained behaviors of a 7-year-old girl with ASD during interruptions of an ongoing activity (Vasquez, Brewer, Leon, & Vasquez, 2017). The success of the intervention in this case may be because the function of the behaviors, as determined by an idiosyncratic trial-based functional analysis, was the interruption of a preferred activity. The authors posit the advance notice served to make the interruption more predictable, referencing the Flannery and Horner predictability hypothesis.

Although these studies share similar methodologies and designs, further replication is required to support advance notice as plausible intervention for increasing predictability, as opposed to advance notice acting as a conditioned establishing operation. This is not especially surprising, since there is currently a paucity of reproducible research. Some estimates place the significant results of original studies in high-ranking psychological journals at 96%, while replications produced 36% significance (Open Science Collaboration, 2015). In behavior analytic research, the lack of replication means that the few studies that make it to publication can bias the field towards conclusions based off of small sample sizes, inaccurately defined independent variables, and poor internal validity.

This may be why, despite its relative lack of empirical support, advance notice is promoted by highly visible organizations such as Autism Speaks Inc. (2008), and current estimates report that about 40% of early childhood educators utilize advance notice as one of the strategies they use to manage behavior in their classrooms (Ritz, 2014). Yet, a review of the literature makes it clear that further evidence and analysis is required to include this intervention as a best practice in educational settings. Since the Individuals with Disabilities Education Act (2004) mandates that scientifically based instructional practices are to be implemented to the maximum extent possible, and the issue of replication is so crucial that the *Journal of Applied Behavior Analysis* has eliminated its Reports format and introduced a Replication format in its place (Hanley, 2017), the thoughtful replication of advance notice as an independent variable is of utmost importance.

The present study extends the current research by analyzing the frequency of compliance and problem behavior during transitions in preschool children with ASD, and applying advance notice alone, guided compliance and social praise, and advance notice combined with guided compliance and social praise during treatment phases.

CHAPTER 2

METHODS

Participants and Setting

Two boys, nominated by their teacher, were recruited due to reported difficulty transitioning during classroom routines. Nate and Charlie, who were five years old at the time of the study, had an autism diagnosis. Both were students enrolled in an early childhood center, which serves children with developmental disabilities in an urban area. After teacher nomination, the researcher spoke on the phone with the parents of both students in order to review the research process and provide an opportunity to answer any questions. Written consent was obtained from both boys' parents in accordance with Temple University's Institutional Review Board.

A third student was nominated by their teacher, and the researcher received assent to participate in the study from the student's grandparent over the phone, but a written consent form sent home to the student's legal guardian was never returned.

Data were collected in a neutral room within the center containing a long kidney shaped table, several child size chairs, and empty bookshelves lining the walls. The participants were encouraged to bring a small toy from the classroom to access during intertrial periods of the experimental phases. Paper data sheets were created to indicate either the occurrence of compliance (marked with a checkmark), noncompliance (marked with an X), and space to write in the details of any problem behavior that was emitted.

Operational Definitions of Dependent Variables

Compliance was defined as walking calmly to the table and completing a simple task presented there (a peg puzzle with 2 pieces out, a shape sorter with 2 shapes out, and a ring stack with 2 rings off were utilized in a rotating order based on mastery data collected during classroom instruction) when given the directive, “Do your work.” The task took 2-5 seconds to complete. It should be noted that incorrectly completing the task (e.g. stacking the rings in an incorrect order, only putting on one ring, etc.) was still recorded as compliance—participants did not receive any prompts to complete the task correctly or indication that they had made a mistake.

Noncompliance was defined as refusal to walk to the table, or refusal to begin or complete the task once at the table within 5 seconds of the researcher giving the vocal directive.

Problem behavior was defined as the occurrence of aggression (hitting with an open palm or fist, using nails to scratch another’s skin, grabbing another’s clothes or limbs), vocal protest (saying any variation of “No” or screaming), property destruction (swiping materials from the table to the floor), elopement (walking or running to a far corner of the room) and/or flopping (falling bodily to the floor).

Partial interval recording was used to measure the occurrence of dependent variables (see Figure 1).

Figure 1. Data sheet used during baseline and experimental phases.

Name:

Date:

Phase:

Trial	Task	Compliant	Problem Behavior	Notes
1				
2				
3				
4				
5				
6				
7				

8				
9				

The interval began once the first verbal direction to the participant was delivered and ended once the task was completed.

Procedure

Once verbal and written consent were obtained, the classroom teacher completed a Functional Assessment Screening Tool (FAST) (Iwata, DeLeon, & Roscoe, 2013) in order to hypothesize the function of the problem behaviors that occurred during transitions from preferred to non-preferred activities. Both assessments indicated escape as the most likely function of the noncompliance and problem behaviors for both children.

Three sessions were conducted per day, two days per week. Some sessions were missed in Nate's case due to unexpected absences; these sessions were conducted on the next day Nate attended school. Each session consisted of three trials, and took approximately 30 minutes to conduct. The researcher, who provided consultation to the classroom, conducted all experimental phases.

Baseline. During baseline, the task materials were arrayed on the table and the researcher delivered the instruction "Do your work." If problem behavior or noncompliance occurred, the participants were allowed escape from the demand for a

two-minute intertrial period, or “break.” During the break, no eye contact or verbal attention was given to the participant, regardless of whether problem behavior occurred. The researcher faced away from the students in a far corner of the room and the participant was able to wander around the room and play with the toy they had brought. If the participant complied, he was given brief verbal praise and the break period was immediately initiated.

Advance notice. The advance notice condition was identical to baseline, except the researcher verbally delivered a one-minute warning (“One minute, then it’s time to do your work”) prior to delivering instruction. The researcher also provided a five second countdown before delivering the instruction, “Do your work.” If the participant complied, he was given brief verbal praise and a two-minute break from demands ensued, as in baseline. If noncompliance or problem behaviors occurred, the researcher refrained from providing any attention, and the two-minute break period began again.

Guided compliance with social praise. Treatment in this condition consisted of the researcher delivering the instruction with no advance notice. If the participant engaged in problem behavior or did not comply with the instruction, the researcher delivered the instruction again and modeled how to complete the task. If further noncompliance or problem behavior occurred, the researcher physically guided the student to complete the task, immediately followed by a two-minute break. If the participant complied by approaching the table and completing the task, brief verbal praise was delivered and the two-minute break occurred.

Advance notice paired with guided compliance and social praise phase. During this phase, the researcher delivered a one minute warning prior to delivering the instruction, as well as delivering a five second countdown prior to the demand. If the participant engaged in problem behavior or did not comply with the instruction, the researcher delivered the instruction again and modeled how to complete the task. If further noncompliance or problem behavior occurred, the researcher physically guided the student to complete the task, followed again by a two-minute break. Compliance was followed by brief verbal praise and a two-minute break from demands.

Interobserver Agreement and Procedural Fidelity

Interobserver agreement. Two observers, a Board Certified Behavior Analyst and an educational supervisor with a Master's in Applied Behavior Analysis, collected trial-by-trial data independently to establish interobserver agreement (IOA) in 50% of sessions. The researcher trained the observers by reviewing the established protocol and recording three practice data points before beginning official IOA data collection. IOA was recorded at 100% across all phases, including baseline, advance notice, guided compliance and social praise, and advance notice guided compliance and social praise.

Procedural fidelity. A protocol checklist (see Figure 2) outlined procedures and processes. Procedural fidelity was measured simultaneously during IOA observations and was 100% across all data points.

Figure 2. Protocol checklist.

Thesis Protocol Checklist

Baseline 1: Deliver the instruction. If problem behavior occurs, allow escape from the demand for two minute period. If child complies, reinforce compliance (they can make an error or leave the task incomplete) with a preferred item or break from demands.

Advance Notice: Deliver 1 minute warning prior to delivering instruction. Deliver a 5 second countdown prior to the demand. Deliver the demand and reinforce compliance. If noncompliance or problem behavior occurs, ignore.

Baseline 2: Deliver the instruction. If problem behavior occurs, allow escape from the demand for two minute period. If child complies, reinforce compliance (they can make an error or leave the task incomplete) with a preferred item or break from demands.

Guided Compliance: Deliver the instruction. If noncompliance or problem behavior occurs, deliver SD again and model task. If further NC or PB occur, physically guide student to comply.

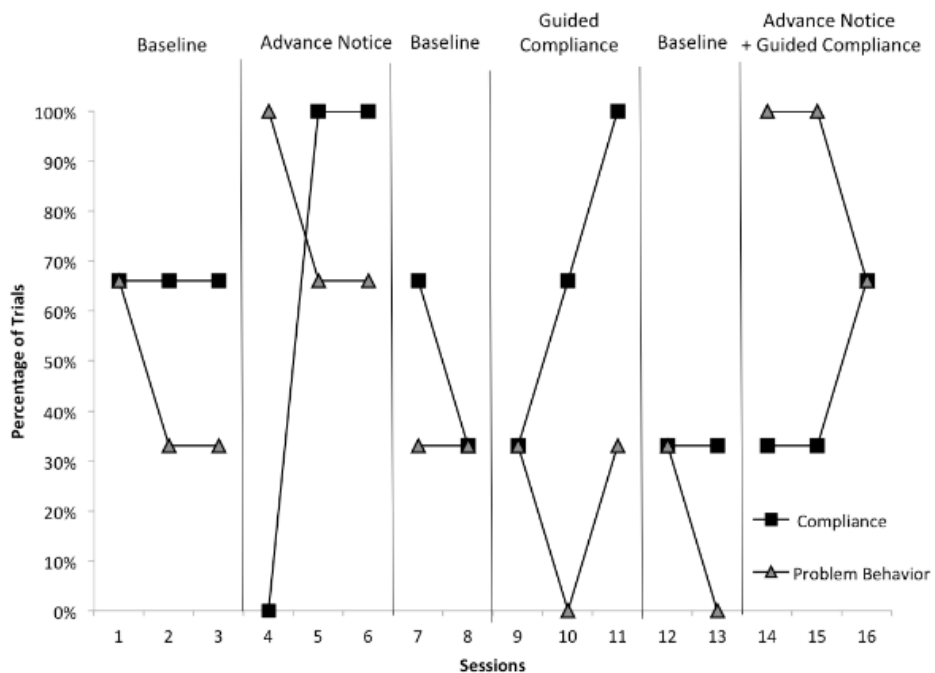
Baseline 3: Deliver the instruction. If problem behavior occurs, allow escape from the demand for two minute period. If child complies, reinforce compliance (they can make an error or leave the task incomplete) with a preferred item or break from demands.

Advance Notice + Guided Compliance: Deliver 1 minute warning prior to delivering instruction. Deliver a 5 second countdown prior to the demand. Deliver the demand and reinforce compliance. If noncompliance or problem behavior occurs, deliver SD again and model task. If further NC or PB occur, physically guide student to comply.

CHAPTER 3

RESULTS

Nate

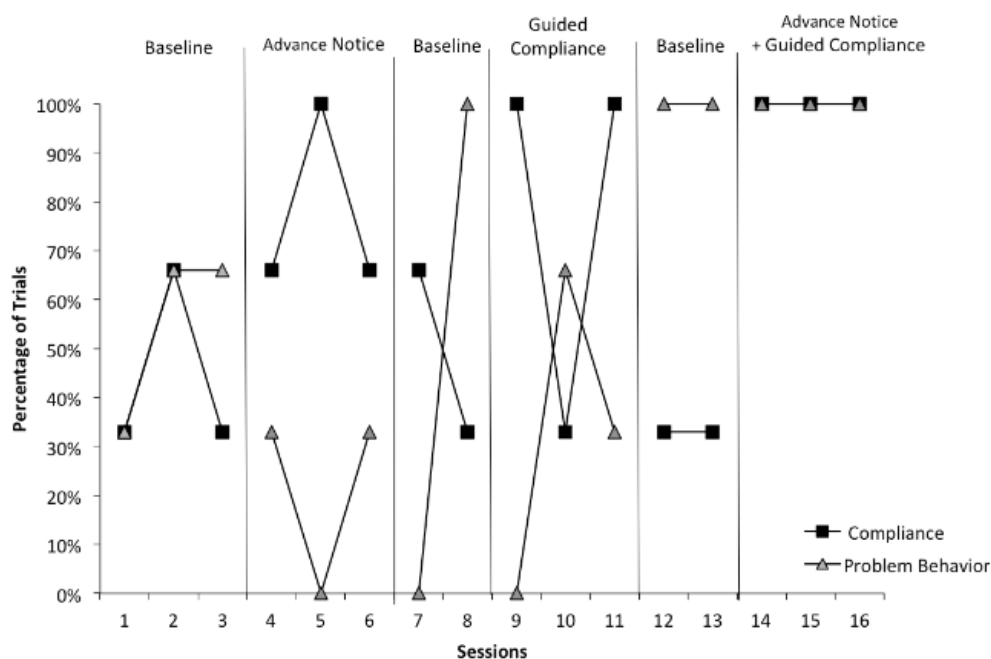
Figure 3. Nate's results.

As depicted in Figure 3, Nate's compliance was stable during baseline ($M = 66\%$), with problem behavior occurring during a mean of 44% of trials. When advance notice was implemented, compliance increased to 100% for the latter 2 of the 3 sessions ($M = 66\%$), while problem behavior also increased to a mean of 77.3%. The second baseline phase saw compliance decline to 49.5%, with problem behavior dropping notably ($M = 33\%$). When guided compliance and social praise was added, Nate's compliance

gradually rose again to 100% by the final trial, with problem behavior decreasing ($M = 22\%$). In the final baseline phase, compliance occurred less frequently than in both initial baseline phases ($M = 33\%$); problem behavior also reduced ($M = 16.5\%$). During the final experimental phase in which both advance notice and guided compliance and social praise were implemented, compliance gradually began to increase ($M = 44\%$). However, problem behavior also increased ($M = 88.7\%$).

Charlie

Figure 4. Charlie's results.



Charlie's data are shown in Figure 4. During baseline, Charlie complied with nearly half of all demands placed ($M = 44\%$) with problem behavior occurring in over half of all trials ($M = 55\%$). Problem behavior decreased ($M = 33.1\%$) once the advance notice

phase was implemented, and compliance increased to 77.3%. During the second baseline phase, levels of compliance decreased from the previous phase ($M = 49.5\%$), and problem behavior returned to similar levels ($M = 50\%$). Once the guided compliance and social praise phase was implemented, problem behaviors gradually increased across trials ($M = 66.3\%$), while compliance varied across sessions but averaged 77.7%. In the final baseline phase, compliance dropped ($M = 33\%$) while problem behaviors maintained their increasing trend and stayed at 100% for the remainder of the phase, as well as the final phase of advance notice plus guided compliance and social praise. Interestingly, Charlie's compliance also rose to 100% across all trials during the final phase.

CHAPTER 4

DISCUSSION

The purpose of this study was to examine the effect of advance notice alone, guided compliance and social praise alone, and advance notice plus guided compliance and social praise, on the reduction of problem behavior during and increased compliance with transitions from preferred to non-preferred activities. The results of this study suggest that while advance notice may increase compliance during transitions from preferred to non-preferred activities for some children, it may also occasion problem behavior. The results also suggest that a consequence component, such as guided compliance and social praise, which has been identified via a functional analysis may be more effective in increasing compliance.

Nate engaged in a higher frequency of problem behavior during phases with an advance notice component than baseline phases. Often, the warning of the upcoming transition was met with screaming. However, rates of compliance were very high during the advance notice only phase, and began to increase during the last session of the advance notice with guided compliance and social praise phase. Guided compliance and social praise had a much more powerful effect on increasing compliance and decreasing problem behavior than any other treatment phase.

Charlie's results differed in a few ways. During the advance notice only phase, compliance increased; further increases were observed during the advance notice plus guided compliance and social praise phase, but they were paired with a matching rate of

problem behavior not seen during the former phase. Specifically, Charlie screamed during every trial when given the advance notice warning. Problem behavior occurred in 100% of trials beginning in the third baseline phase as well, but a lower rate of compliance was observed consistent with the first two baseline phases. More severe behaviors, such as aggression and property destruction, were observed during intertrial periods due to the researcher withholding the materials related to the task.

Although escape from demands was identified as the function of problem behavior, Charlie often transitioned to the task without issues but simply did not respond at the table or mouthed the objects. This indicates a possible confounding influence of the incorrect function being identified or multiple functions present.

The results of this study suggest that while advance notice may increase compliance in students with ASD, it may also have the effect of occasioning problem behaviors. Although results for each participant varied, by the final treatment phase, both Nate and Charlie engaged in screaming when the advance notice warning was delivered. Guided compliance and social praise had a much greater effect in decreasing problem behavior and increasing compliance for Nate; the results were less consistent for Charlie, which may suggest that the escape function was misidentified.

These results are in agreement with some aspects of current research base. McCord, Thomson, and Iwata (2001) also found that advance notice alone was ineffective in reducing problem behavior. Other studies evaluating the effects of advance notice have found that compliance is highest and problem behavior is lowest when extinction is

implemented alone or as part of a treatment package including advance notice or differential reinforcement of other behavior (DRO) (Cote et al., 2005; Wilder et al., 2006; Wilder et al., 2007). Nate and Charlie's screaming during advance notice component phases was similar to the findings of Wilder et al. (2010), in which participants yelled "No" directly following the delivery of advance notice.

Both this study and those cited above do not support the original findings of Tustin (1995), in which problem behaviors decreased with advance notice of an upcoming transition and the choice of when to begin the impending task. One possible reason might be due to the design of Tustin's study. Allowing his participant a two-minute period in which to choose to terminate the prior activity on his own before beginning the new one could have been the maintaining factor in the decrease of stereotypy. As for the argument put forth by Flannery and Horner (1994) that advance notice reduces problem behavior by increasing predictability, the current study did not find evidence to support that making an upcoming non-preferred activity more "predictable" by signaling its arrival. Problem behavior at higher rates for Nate and Charlie during advance notice phases, which in this context served as a warning signal of an upcoming non-preferred activity. Future research could determine whether predictability is a controlling influence by studying whether advance notice increases compliance or reduces problem behaviors caused by transitions from preferred to non-preferred activities.

The results of the present study support the hypothesis that advance notice functioned as a CMO-R. The 1-minute warning, the 5-second countdown, and the verbal

direction of “Do your work,” provided 3 opportunities to occasion problem behavior, as opposed to only one opportunity during baseline and guided compliance phases. For advance notice to be effective it must be unpaired from the CMO-R; noncontingent unpairing to reduce problem behavior during instructional conditions has shown initial effective results (Kettering, Neef, Kelley, & Heward, 2018) and may be a promising direction for future research.

The broader issue at stake is one of replication, “the essence of believability” according to Baer, Wolf, and Risley (1968). Closely aligned conceptual replications, in which the dimensions of dependent and independent variables do not differ substantially from initial study to replication study, are necessary in order to measure the efficacy of interventions (Coyne, Cook, & Therrien, 2016). Advance notice research has been conducted with more distal replications, in which a major variable (e.g., using participants with developmental delays versus students without developmental delays) is manipulated. Distal replications play a significant role in evaluating generalizability, but with weak evidence to support advance notice, direct or closely aligned replications should be considered as a matter of priority.

The role of single subject methodology in evaluating external validity of interventions and determining inclusion of interventions as evidence-based practices is contingent on replication. Methods for ensuring external validity through the process of replication in single-subject methodology are defined best by Horner et al. (2005). They suggest that at the very least, experimental control should be demonstrated across at least

5 single-subject studies published in peer-reviewed journals. Since no other studies have been able to reproduce results that support advance notice alone as an effective intervention for reducing problem behavior, it cannot be classified as evidence based practice.

Limitations of this study should be noted. This study was conducted towards the end of the academic year for the participants, which means previous exposure to the independent variables may have been present. In addition, one instruction (“Do your work”) was delivered in one context (an unfamiliar room with a task completion activity presented at the table). A preference assessment could identify a less preferred activity, or an evaluation of the independent variables in a naturalistic environment could have yielded different results. Counterbalancing may also have controlled for any order effects that may have influenced the findings. Additionally, short data collection periods are a serious limitation of this study—extending the phases in order to allow the data to stabilize could have demonstrated stronger internal validity.

A final limitation of this study includes relying on indirect assessments. Conducting a functional analysis could have eliminated the possible confounding influence on whether socially mediated negative reinforcement (escape) or socially mediated positive reinforcement (access to tangible items) was the true function of Charlie’s problem behaviors during transitions. A brief functional analysis, as outlined by Wilder et al. (2006), or a trial-based functional analysis, as used by Vasquez, Brewer, Leon, and Vasquez (2017) may be a more effective tool for future researchers. Additionally, an

investigation into the motivating operations surrounding negatively reinforced problem behavior and the environmental context of the transition should be analyzed, since a lack of choice or control can be an important yet easily overlooked variable (Langthorne, McGill, & Oliver, 2014) and was likely the confounding variable of Tustin's 1994 study.

Social acceptance of advance notice continues to be high, as evidenced by its inclusion as a component of positive behavior support approaches to treating problem behavior in children with ASD (e.g. Devine, 2014; Hamlin et al., 2016; Hudson & Coffin, 2007), as well as for typically developing children (Nicholson & O'Neal, 2008; "Managing Problem Behavior at Home," 2017). Often, no justification or citation is provided for the efficacy of advance notice. Its continued recommendation may in part be due to the relative intuitiveness of using this intervention, since it can be implemented quickly and easily with no training required.

Despite the relative ease of use, advance notice only provides an additional aural stimulus to the environment and does not provide specific information related to the upcoming transition. There are many alternative antecedent strategies to decrease problem behavior that use visual information, including video models, social narratives, and activity schedules (Brewer, Strickland-Cohen, Dotson, & Williams, 2014; Langthorne, McGill, & Oliver, 2014; Lequia, Wilkerson, Kim, & Lyons, 2015). In a quantitative synthesis of research specific to students with ASD, activity schedules were the most frequently researched and had variable effects as opposed to video modeling and social narratives, which had strong effects and may be more promising interventions

(Lequia, Wilkerson, Kim, & Lyons, 2015). There were also differences across behaviors that occurred as a result of transitions, with less severe behaviors, such as off-task behavior, showing a higher rate of reduction than more severe behaviors, such as aggression. These interventions may take more time, training, and resources, but make up for it in empirical support and should be considered for learners who demonstrate problem behaviors during transitions.

In summary, researchers and clinicians should utilize function-based assessments in order to devise best-practice approaches to problem behaviors. While advance notice may be increase compliance with activity transitions, this study demonstrates that there is still further research to be done in order to determine if it is effective in reducing problem behavior. Extinction alone, or paired with other strategies with stronger empirical evidence, should be considered when selecting strategies for increasing compliance and reducing problem behaviors during transitions for children with developmental disabilities.

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