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A COMPARISON OF RATE AND LATENCY DURING THE INTERVIEW-INFORMED SYNTHESIZED CONTINGENCY ANALYSIS (IISCA)[1]

UNA COMPARACIÓN DE TASA Y LATENCIA DURANTE LA ENTREVISTA INFORMADA SINTETIZADA DE ANÁLISIS DE CONTINGENCIAS (IISCA)

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Resumen

Este estudio reanaliza el Análisis de Contingencias Sintetizadas Informado por Entrevista basado en la latencia (IISCA) como una alternativa más eficiente al formato tradicional basado en tasas, para evaluar conductas desafiantes en poblaciones neurodivergentes. El análisis funcional es considerado el estándar de oro dentro del Análisis Conductual Aplicado (ACA); sin embargo, los métodos convencionales basados en tasas suelen requerir exposiciones repetidas a conductas desafiantes, lo que genera preocupaciones éticas en torno a la seguridad y el trauma. El IISCA basado en la latencia ofrece una solución al enfocarse en el tiempo para la ocurrencia de la primera respuesta, en lugar de la frecuencia, reduciendo la exposición a las situaciones evocativas. Esta investigación amplía hallazgos previos con participantes brasileños en una muestra estadounidense con autismo y otras discapacidades del desarrollo. Los resultados mostraron un control funcional consistente en ambos grupos, con una fuerte concordancia entre los resultados de IISCA basados en latencia y en tasas, reduciendo la duración del análisis en un 51% y la ocurrencia de conductas en un 86%. Las evaluaciones de expertos indicaron que el IISCA basado en latencia es seguro, eficaz y socialmente válido, con altos niveles de eficiencia y aceptabilidad. Estos hallazgos resaltan la generalización del IISCA basado en latencia y respaldan su adopción como un método de evaluación potencialmente más compasivo, que prioriza el bienestar del cliente sin comprometer el rigor analítico. Diversos aspectos de este enfoque se alinean con los actuales llamados para realizar un ACA informado sobre el trauma, subrayando su potencial como método preferido por analistas de la conducta que trabajan con poblaciones diversas. Futuras investigaciones deberían explorar su aplicación en distintas topografías conductuales y contextos clínicos.

Palabras clave: eficiencia, análisis funcional, latencia, tasa, seguridad

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Abstract

This study reanalyzes the Latency-Based Interview-Informed Synthesized Contingency Analysis (IISCA) as a more efficient alternative to the traditional Rate-Based IISCA for assessing challenging behaviors in neurodivergent populations. Functional analysis is a gold standard in Applied Behavior Analysis (ABA), yet conventional rate-based methods often require repeated exposures to challenging behavior, raising ethical concerns regarding safety and trauma. Latency-based IISCA offers a solution by focusing on the time to the first response rather than the response rate, thereby reducing exposure to evocative situations. This research builds upon prior findings with Brazilian participants, extending the approach to a U.S. cohort with autism and other developmental disabilities. Results demonstrated consistent functional control across both groups, with latency-based IISCA strongly aligning with rate-based outcomes, reducing analysis duration by 51% and behavioral occurrences by 86%. Evaluations by expert researchers indicated that the latency-based IISCA was safe, effective, and socially valid, with high ratings for acceptability and efficiency. These findings highlight the generalizability of latency-based IISCA, supporting its adoption as a potentially more compassionate assessment method that prioritizes client well-being while maintaining analytic rigor. Many aspects of this approach align with contemporary calls for trauma-informed ABA practices, underscoring its potential to serve as a preferred method for behavior analysts working with diverse populations. Future research should explore broader applications of latency-based IISCA across various behavioral topographies and clinical settings.

Keywords: efficiency, functional analysis, latency, rate, safety

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In the Applied Behavior Analysis (ABA) field, functional analysis is widely recognized as the most reliable method for assessing challenging behaviors (Beavers et al., 2013; Hanley et al., 2003; Melanson & Fahmie, 2023). This approach involves systematically altering environmental conditions to provoke challenging behaviors in a test setting and to reduce or eliminate them in a control setting (Iwata et al., 2000). By comparing the frequency of behaviors across these conditions—high rates in the test condition and low or absent rates in the control condition—clinicians can determine if a specific function is responsible for maintaining the behavior (Lemos et al., 2023).

Functional analyses are especially important for neurodivergent populations and individuals with developmental delays (Kim, 2023) as challenging behaviors are more prevalent among individuals with autism and/or intellectual disabilities than among those without these diagnoses (Didden et al., 2012; Jang et al., 2011; McTiernan et al., 2011; Simó-Pinatella et al., 2017, 2018, 2019). Challenging behaviors such as aggression, self-injury, and property destruction occur more frequently in individuals diagnosed with autism compared to those with intellectual disabilities (Kim 2023). Given the high-risk nature of

challenging behaviors in individuals with autism, the development and application of functional analysis technologies are critical for early evaluation and intervention.

Although functional analysis is the recommended approach for assessing challenging behaviors, it remains underutilized by ABA professionals working with individuals diagnosed with autism (Lemos et al., 2024; Oliver et al., 2015; Roscoe et al., 2015). Practitioners often cite the complexity of implementation, time requirements, and the risk of triggering dangerous challenging behaviors as barriers to its widespread use (Lemos et al. 2024; Oliver et al. 2015; Roscoe et al. 2015). Beyond logistical challenges, there are growing concerns regarding the ethical implications and adequacy of functional analysis within ABA. According to Mathur et al., (2024), there are significant criticisms of ABA by the neurodivergent community, particularly regarding the assessment and treatment of challenging behaviors. The main criticisms are related to not considering the assent of neurodivergent individuals in evaluations and interventions, which had already been addressed as a correction to be made to functional analysis technology (Rajaraman et al., 2023).

Recent developments have introduced faster, more efficient, and more assent-based approaches to functional analyses. Hanley et al. (2014) introduced a functional analysis model using a single process (i.e., combining interview, observation, and functional analysis) that identified individualized contingencies for the challenging behavior of three children diagnosed with autism. The experimenter began the assessment with an open-ended interview to determine possible antecedents and consequences that could be contributing to challenging behavior in the home and school environments. The experimenter then briefly observed each child while unsystematically introducing the interview-informed environmental events to finalize the synthesized contingency to be evaluated in the functional analysis (i.e., the experimenter could try to evoke some precursor through removing access to some tangibles and ending social attention). The assessment ended with a functional analysis that included a single test condition compared to a matched control, validating the outcomes of the interview and observation. The entire functional assessment model was completed within two visits, allowing the experimenter to efficiently move on to treatment reducing challenging behavior and teaching new contextually appropriate behavior (i.e., communication, toleration, cooperation).

The functional analysis originating from (Hanley et al., 2014) was eventually termed the interview-informed synthesized contingency analysis (IISCA) to represent commitments to its core procedures

(Jessel et al., 2016). Further evaluation of the entire functional assessment process including the IISCA can require as little as a single 1-hr outpatient visit, with the IISCA requiring about half the visit time (Coffey et al., 2019). However, the time devoted to conducting the IISCA largely depends on clinical judgment in determining the session duration and can likely be reduced further by relying on briefer sessions.

Jessel et al. (2020) conducted a consecutive controlled case series of 18 IISCAs to determine the contribution of session duration on the (a) overall duration of the functional analysis period and (b) effects efficiency may have on interpretations of control. The authors developed a multilevel structured criteria for identifying a more nuanced interpretation (i.e., strong, moderate, weak control) beyond a traditional binary approach (i.e., there is or is not control). By incorporating assessments of trend, level, and variability, multilevel evaluations allow for a more detailed understanding of the extent and nature of functional control, distinguishing between strong, moderate, and weak levels. This classification is particularly advantageous when designing individualized interventions, as it identifies cases where synthesized contingencies may require refinement or adjustment to strengthen control. For instance, identifying moderate or weak control provides practitioners with actionable data to optimize interventions without prematurely concluding that a functional relationship is absent (Jessel et al., 2020). The original IISCAs included 10-min sessions and most maintained strong levels of functional control when rates of challenging behavior were reanalyzed during the first 5 and 3 min of the sessions. In Study 2, the authors conducted an additional eight IISCAs using 3-min sessions and found all but one to be differentiated, creating an analysis that takes only 15 min to complete. Although the IISCA does prove to be an efficient functional analysis format, the reliance on the measure of rate requires multiple exposures to challenging behavior, and in certain cases that may not be ideal, as point out some therapist and members of neurodiversity community (Flowers & Dawes, 2023; Graber & Graber, 2023).

Thomason-Sassi et al. (2011) presented one of the first demonstrations of a functional analysis using a measure of latency rather than rate of challenging behavior to demonstrate functional control. Latency refers to the time between the onset of a given stimulus or situation and the occurrence of the first target response. The experimenters found that high rates of responding often corresponded to brief latencies and then reanalyzed the latency to the first challenging behavior in 38 rate-based functional analyses to find that the interpretations of the functions of challenging behavior remained

relatively consistent (i.e., 87% correspondence). The results support the potential to improve safety during the functional analysis with the use of latency because only a single instance of challenging behavior need occur during each session of the functional analysis.

In more recent adaptations, the measure of latency was incorporated into the IISCA model (Jessel et al., 2018). The latency-based IISCA was conducted with two participants to identify the functions of their elopement, which often placed them in dangerous scenarios when in public or community settings. That is, the participants would run away from supervising caregivers in situations with strangers who could potentially abduct them. The latency-based IISCA was able to identify scenarios in which elopement was likely to occur in analogue and safe environments with only three instances of elopement observed over the course of an analysis period of 10 min.

Jessel et al. (2024) conducted a two-part study to further evaluate the validity of the latency-based IISCA. In the first study, nine participants from Brazil experienced both latency-based and rate-based IISCAs. The findings revealed that, when the participant experienced the latency-based IISCAs, they did not exhibit challenging behavior during control conditions and brief latencies to challenging behavior in test conditions, indicating functional control. Similarly, when the participants then experienced the rate-based IISCAs, they showed no challenging behavior in control conditions but elevated rates of challenging behavior in test conditions. The results from the nine latency-based IISCAs aligned with those of the nine rate-based IISCAs. This suggests that latency-based IISCAs can serve as a briefer alternative to rate-based IISCAs while still accurately determining functional control over challenging behavior. In the second study, 16 participants underwent the latency-based IISCA, and clinicians filled out forms evaluating the safety, acceptability, and helpfulness of the procedures. All latency-based IISCAs were differentiated and indicated a socially mediated function that could inform a function-based treatment. The clinicians who conducted the latency-based IISCAs found the procedures to be safe, acceptable, and helpful. These results support the generalizability of the latency-based IISCA, as it was conducted with both female and male participants ranging from 2 to 16 years old, including individuals with and without various diagnoses exhibiting a range of severe and non-severe challenging behaviors in clinics, schools, and homes across the United States and Brazil.

Latency-based IISCAs are likely to be differentiated, require relatively brief administration, and minimize exposure to challenging behavior. These features of the latency-based IISCA can make the functional analysis meet several criteria of compassionate care, as it is

defined as converting empathy into action to alleviate suffering (LeBlanc et al., 2020; Rodriguez et al., 2023). This may be able to help mitigate some of the concerns raised by the neurodiversity community against the ABA field. The key features that make the latency-based IISCA more aligned with a compassionate functional analysis framework are: (1) the sessions are discontinued after the first instance of challenging behavior, minimizing the client's exposure to the evocative events and potential distress (Rodriguez et al., 2023); (2) provides powerful synthesized reinforcers to maintain a level of calm and engagement, prioritizing the client's well-being (Penney et al., 2023); (3) the whole analysis period requires around 10 min and only three instances of challenging behavior, prioritizing the relationship with client and family (Rohrer et al., 2021; Rohrer & Weiss, 2023); and (4) the latency-based IISCA has been reported by clinicians in publication as acceptable, helpful, safe, and efficient (Jessel et al., 2024), matching measures of social validity with values of compassionate care (Penney et al., 2023).

It is important to point out that there has only been one study in which the results of a latency-based and rate-based IISCA have been compared and the impact on levels of control was not evaluated. In addition, the reanalysis methods from the traditional Thomason-Sassi et al. (2011) study have yet to be applied to the IISCA format. Therefore, this study aimed to reanalyze rate-based IISCAs conducted in the United States to determine how often the latency would impact interpretations of the levels of functional control. We used the same strategy as Thomason-Sassi et al. (2011) to reanalyze a collection of rate-based IISCAs and incorporated the multilevel structured criteria from Jessel et al. (2020). We conducted the study to determine if the same interpretations of functional control would be made regardless of the measure (rate or latency) using the multilevel structured criteria and a panel of experts. In addition, we included a questionnaire of clinical validity to determine if clinicians evaluating the differences between the rate-based and latency-based IISCAs would find any benefits to using the latency-based format.

Method

Participants and Settings

Participants were 11 individuals diagnosed with autism and other related developmental disabilities (Table 1). The majority of the participants were male (9 of 11) and the mean age was 7 years old (range, 3 to 17 years old). Participants attended a specialized school or were referred to a university-based outpatient clinic for assessing and

treating challenging behavior based on reports from caregivers, teachers, or school administrators. Participants from the specialized school received applied behavior analytic services daily between the hours of 9:00 am and 2:45 pm. Functional analyses were conducted as clinical services as a result of challenging behavior that was difficult to manage or disrupted their typical learning environment. The participants who were referred to the university-based clinic received assessment and treatment services two to three times per week for one hr each visit. The entire functional assessment period, including the IISCA, was conducted during the first 1-hr visit for all participants.

Table 1

Participant Demographics

Participant	Age	Sex	Diagnosis	Challenging behavior	
				Non-dangerous	Dangerous
Adam	3	M	ASD	loud voc	agg, SIB
Eric	6	M	ASD	loud voc, tantrums	Agg, dis
Larry	4	M	ASD	loud voc, tantrums	agg, dis
Mark	8	M	ASD/ADHD	loud voc	agg, SIB, dis
Nate	6	M	ASD	tantrums	agg, SIB
Roni	9	M	ASD	loud voc, tantrum	agg, dis, dropping
Sam	9	F	ASD/ADHD	loud voc, tantrums	dis
Dan	2	M	ASD	loud voc, tantrums	agg, dis, dropping
Nijiro	8	M	ASD	loud voc	agg, SIB, dropping
Pablo	5	M	ASD	loud voc	agg, dis
Callia	17	F	ASD	loud voc, flopping	agg, SIB, dis

Note. ASD refers to autism spectrum disorder. ADHD refers to attention deficit/hyperactivity disorder. Loud voc refers to loud vocalizations. Agg refers to aggression. SIB refers to self-injurious behaviors. Dis refers to disruptions.

Response Measurement

Challenging behavior included any dangerous (e.g., aggression, self-injury, or disruption) or non-dangerous (e.g., screaming, crying, whining) topographies of behaviors targeted for assessment and intervention. Dangerous behavior was defined as slapping, kicking, hitting, scratching, or biting directed towards the therapist (aggression), oneself (self-injury), or inanimate objects (disruption). Dangerous behavior could also include dropping to the floor that caused audible contact with the floor and body parts such as the head. Non-dangerous behavior included loud vocalizations with or without comprehensible speech (protests or profanity), flopping to the floor without audible contact of body parts typically landing in a sitting or lying position, and tantrums of crying or whining for more than 15 s. Caregivers reported all participants to exhibit some combination of non-dangerous and dangerous topographies of challenging behavior.

Challenging behavior was measured as a count and latency. Each instance of challenging behavior was recorded during a session. We calculated a rate of challenging behavior by dividing the count by the session duration. Latency to challenging behavior was calculated as the total time in which each instance of challenging behavior occurred from the beginning of the session.

Interobserver Agreement (IOA) and Intercoder Agreement (ICA)

A secondary observer recorded challenging behavior during a mean of 58% (range, 33 to 100%) of the sessions of the IISCA. Sessions were separated into 10-s intervals and the smaller number of instances recorded by an individual was divided by the larger number of instances in each interval. A mean was then calculated for each session. In addition, IOA from the data files were extracted for the latency to the first response. An agreement was scored if the latencies of both observers occurred within the same 10-s interval. A disagreement was scored if the latencies occurred in different intervals. We then divided the number of agreements by the total number of sessions in which both observers recorded data for each participant. The mean IOA for the rate of challenging behavior and latency to challenging behavior for all participants was 98% (97 to 99%) and 97% (80 to 100%), respectively. Two coders applied the multilevel structured criteria to all IISCA applications twice: Once with the data represented as a rate and another with the data represented as a latency. An agreement was scored as both coders identifying the same level (strong, moderate, weak). A disagreement was scored if at any time the coders' recording of the level did not match. Intercoder agreement (ICA) was calculated by dividing

the number of agreements by the sum of disagreements and agreements. The mean ICA was 100%.

Experimental Design

Sessions during the IISCA were conducted in a multielement design typically in the sequence of control, test, control, test, and test. The final consecutive test sessions break the rapid alternation between control and test sessions, offering additional assurance that the proposed contingency effectively influences problem behavior when implemented (Jessel, 2022). However, this sequence was modified or extended when necessary to improve interpretations of functional control. For example, if challenging behavior occurred during a control session, additional control sessions would be interspersed into the sequence to ensure that challenging behavior remained low over repeated sessions. The researchers conducted additional test sessions if challenging behavior during the test condition was variable and low.

Procedure

The functional assessment process began with an open-ended interview (see Hanley, 2012 for full interview) implemented by the therapist with caregivers or staff members. The interview was conducted within 15 min and included questions regarding the specific topographies of challenging behavior to be targeted, antecedents likely to evoke challenging behavior, and consequences likely to be maintaining challenging behavior. Rather than attempting to isolate antecedents and consequences for challenging behavior, the interview was designed to identify how the antecedents and consequences naturally combined to create the problematic context as a whole, as represented in the home or school environment. Therefore, the interview was discontinued when the therapist could confidently design a test condition of the IISCA that replicated the ecologically relevant contingency of interest reported by caregivers in need of a treatment.

The open-ended interview was followed by a brief (5 to 10 min) direct observation of the participant. The observation period was used to refine behavioral and procedural definitions before conducting the IISCA. The therapist unsystematically evaluated the putative contingency informed by the interview during this time while caregivers or staff members observed. Any topographies of challenging behavior assumed to be functionally related that occurred during the observation were added to the targeted response class. This often involved identifying less dangerous behavior that occurred prior to any more severe topographies. In addition, caregivers were probed for more

information if challenging behavior was not reliably occurring when the evocative events were presented and eliminated during the reinforcer availability. The therapist attempted to evoke and eliminate the challenging behavior at least twice using the suspected contingency before beginning the IISCA.

Table 2

Functional Analysis Information

Name	Session information		Individualized contingency	
	Total (#)	Duration (min)	Evocative event	Preferred event
Adam	5	3	Adult-directed play	Access to independent play with iPad
Eric	5	3	Removal of interactive play and video games	Access to interactive play with video games
Larry	5	3		
Mark	6	3	Adult-directed play	Access to independent play
Nate	5	3	Transitions away from activities	Access to interactive play
Roni	5	3	Transitions away from play area	Access to iPhone in play area
Sam	5	3	Transitions to work area	Access to independent play
Dan	6	5	Removal of iPad	Access to iPad
Nijiro	6	5	Blocked access to rituals and preferred activities	Access to rituals and preferred activities
Pablo	6	3	Transitions to work area	Access to child-directed play
Callia	5	5	Transitions to work area	Access to electronic devices

The IISCA included a single test condition compared to a matched control. The synthesized contingency informed by the interview and observation was arranged for the target challenging behavior in the test condition. The test session would begin with the removal of any preferred events and the presentation of the evocative events. For example, Adam's challenging behavior was reported to occur when parents removed his iPad and attempted to teach him to play with other activities. Therefore, Adam's test session began with the removal of his iPad and the presentation of instructions in the context of play with other available items such as books. If challenging behavior occurred, the evocative events were removed (e.g., instructions with books) and the preferred events (e.g., iPad) were re-presented for 30 s. During the

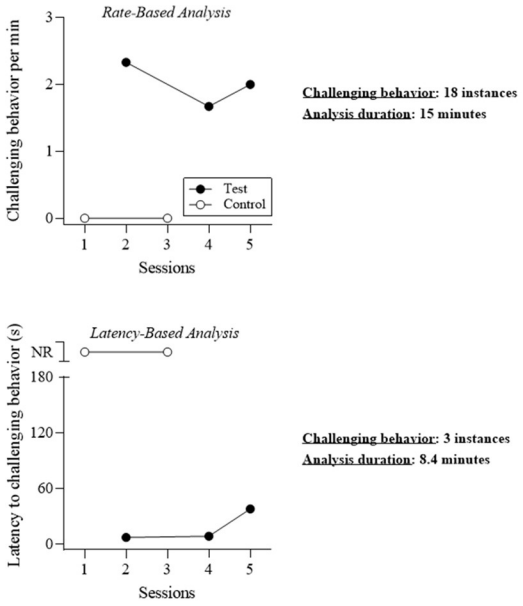
control condition, the preferred events were noncontingently available throughout the entire session and no evocative events were presented. The specific preferred and evocative events for each participant are presented in Table 2. We conducted a median of 5 sessions (range, 5 to 6) per IISCA with a median session duration of 3 min (range, 3 to 5 min). If strong control was not achieved on the 5 sessions, more sessions could be added on the IISCA, as you can see in Jessel et al. (2020).

Data Analysis

All IISCAs were originally conducted using a rate-based measure of challenging behavior. We reanalyzed the rate-based IISCAs by calculating the latency to the first occurrence of challenging behavior and depicted these results as if a latency-based analysis was conducted (see Figure 1 for an example). The rate-based and latency-based figures were then presented to a group of expert panelists for evaluation.

Figure 1

Comparison of Rate-Based and Latency-Based Analyses



Note. The bottom panel represents the latencies to the first response from the data in the top panel.

We used the multilevel structured criteria from Jessel et al. (2020) to evaluate interpretations of strong, moderate, or weak levels of control. Analysis results were interpreted using two criteria: overlap between the test and control conditions and challenging behavior during the control condition. Analyses with strong control did not have overlapping data or challenging behavior during the control condition. Analyses with moderate control had some overlap or some challenging behavior during the control condition, whereas analyses with weak control had both. The criteria did not need to be modified in any way to evaluate the latency-based format.

Expert Panel Evaluation and Clinical Validation

Six adults (three males and three females) were selected to serve as expert panelists who evaluated functional control based on the results of the IISCAs. Those who were identified as experts and included in the panel had to be a doctoral-level researcher with at least ten years of experience. Five of the six expert panelists held a certification of Board Certified Behavior Analyst at the doctoral level (BCBA-D) while one held a BCBA. Three of the six were also Licensed Behavior Analysts (LBA) in their respective states. The mean age was 39 years old (range, 30 to 47 years old) and they had a mean of 17 years of experience in the field (range, 10 to 24 years). The expert panelists had extensive experience working with children who exhibit challenging behavior and conducting functional analyses. Each expert panelist was presented with a PDF document that first outlined the purpose of this study and the instructions for completing their evaluation. They were presented with each figure and asked if functional control had been demonstrated. A functional analysis was determined to have control if at least five of the six expert panelists agreed that control was demonstrated.

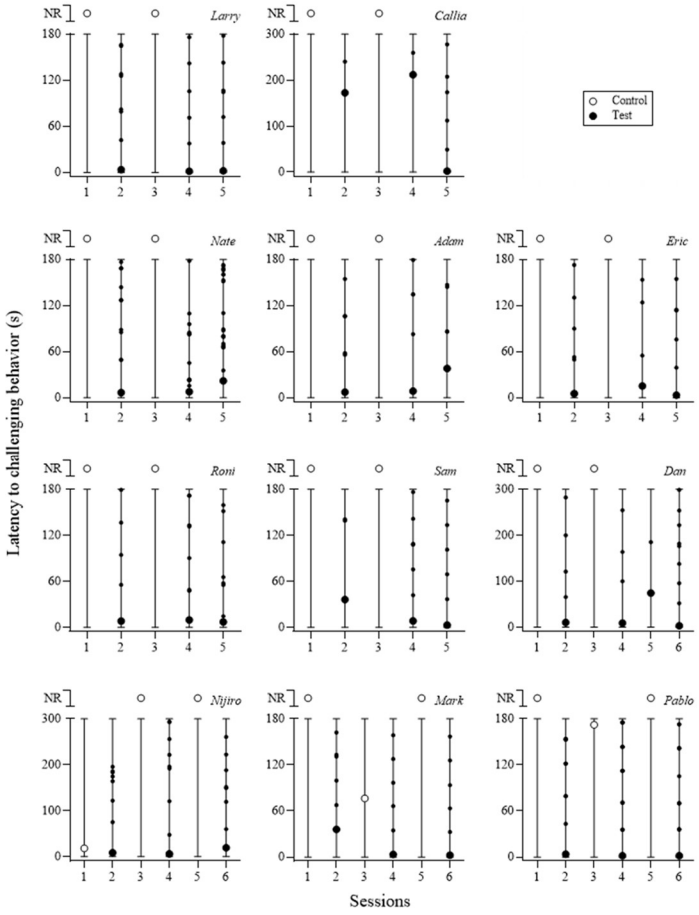
A collection of clinicians was also asked to serve on a separate panel evaluating the outcomes of the rate-based IISCAs and the reanalysis of the data as a latency-based IISCA. The panel of clinicians completed the evaluation to determine the level of overlap between interpretations with the expert panelists and to provide clinical validation of the functional analysis procedures. Eight clinicians (two male and six female) completed the evaluation. The mean age of the clinicians was 30 years old (range, 25 to 38 years old). All clinicians were BCBAs and six of the eight were LBAs. The mean experience of the group was 9 years in the field (3 to 16 years).

In addition to the graphical depiction of the rates and latencies to challenging behavior, information was provided on the total duration of each analysis and instances of challenging behavior observed. The total duration of the analysis was calculated by multiplying the number of

sessions by the session duration. The expert panelists and clinicians were asked to complete a questionnaire regarding the acceptability, helpfulness, safety, and efficiency of the latency-based IISCA. Questions were presented on a 7-point Likert scale with the opportunity to provide comments if the panelists so chose to expand on their answers. The efficiency was measured using the equation (1-(latency/rate))*100.

Figure 2

Reanalysis of Latency during Rate-Based IISCAs



Note. NR refers to no response. Larger symbols indicate the first response within a session. Smaller symbols represent all responding thereafter.

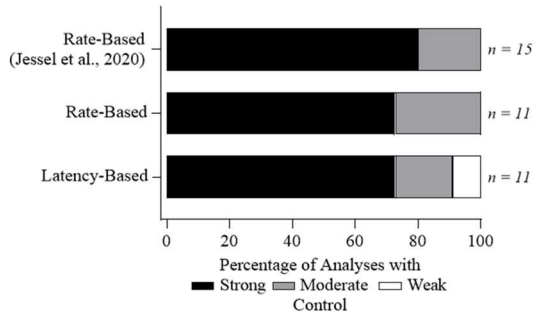
Results

Every instance of challenging behavior, as they occurred in time during the sessions from the IISCAs for the 11 participants, are presented in Figure 2. Higher rates of challenging behavior were observed during the test condition (M = 2.33 response per min [RPM]; SD = 1.42) in comparison to the control (M = 0.03; SD = 0.05). The rate-based analyses took, in mean, 19.2 min (range, 15 to 30 min) to conduct and a mean of occurrences 23.5 of challenging behavior (range, 10 to 48) before a function was identified. The rates of challenging behavior were inversely correlated to the latency to the first response. Latency to challenging behavior was brief for all participants during the test condition (M = 22.4 s; SD = 35.9) and extended during the control condition with eight of the 11 participants not exhibiting challenging behavior in any control sessions. Based on the reanalysis, the latency-based IISCA required 9.4 min (range, 6.1 to 17.3 min) to conduct and 3.4 occurrences of challenging behavior (range, 3 and 4) before the same functions from the rate-based analyses were identified.

The results of the analysis of control using the multilevel structured criteria are presented in Figure 3. The results of the 3-min analyses with some control to be evaluated (i.e., no analyses without control) of Jessel et al. (2020) are included for comparison. The majority of the applications from Jessel et al. (2020) had strong control (80%) with the remaining applications having moderate control (20%). A similar pattern was observed with the rate-based and latency-based formats both having many applications with strong control (73%). However, the remaining applications with the rate-based format had moderate control (27%), whereas one application with the latency-based format was determined to have weak control (9%).

Figure 3

Levels of Control



Based on the expert panel, all rate-based and latency-based IISCAs were determined to have functional control. In addition, the effects were replicated with the clinicians, with all analyses meeting the criteria of having functional control. This suggests that the outcomes of the latency-based IISCA are likely to correspond with the outcomes of the rate-based IISCA and that the results are interpretable with clinicians who have less experience than expert researchers. Both the expert panelists and clinicians rated the latency-based IISCA highly. The expert panelists found the latency-based format to be acceptable (M = 6.8; range, 6 to 7) and helpful (M = 6.3; range, 5 to 7). In addition, all expert panelists believed the latency-based format to be highly safe and efficient (M = 7). Overall, they reported that they were likely to use the latency-based format in the future (M = 6.3; range, 5 to 7). The clinicians also found the latency-based format to be acceptable (M = 6.9; range, 6 to 7), helpful (M = 7), safe (M = 6.7; range, 5 to 7), and efficient (M = 6.7; range, 5 to 7). The clinicians reported a high likelihood (M = 6.6; range, 6 to 7) of using the latency-based format when confronted with child who exhibited challenging behavior in the future.

Discussion

The results of the latency-based analyses corresponded with the rate-based analyses in all 11 applications. In addition, the expert panelists and clinicians found the latency-based analysis to be an acceptable alternative that improved the safety of the functional assessment process by reducing the analysis duration and the exposure to challenging behavior. Interestingly, there was a high level of correspondence in the evaluation of functional control between the expert panelists and the clinicians. Previous research has found that interrater agreement during the interpretation of functional analysis results is typically low among those with as high as postdoctoral training (Hagopian et al., 1997; Roane et al., 2013). All the clinicians who completed the evaluation form in the current study had a terminal master's degree. This improvement in interpretations among the clinicians could be due to two possible explanations.

First, the functional analyses in the current study only had two conditions and previous studies evaluated interpretations of control using functional analyses with four or five conditions. Thus, not only does the IISCA reduce possible overlap with other test conditions that could impair visual analysis, but it also reduces the probability of an incorrect interpretation of a binary choice. Second, the majority of applications had strong control and there is likely a correlation between level of control and ease of interpretations. In other words, functional

analyses with weak control may reduce agreement and functional analyses with strong control may improve agreement. Future researchers could apply the multilevel structured criteria to published data sets to evaluate the relation between level of control and interpretations.

These results suggest that latency as a measure of challenging behavior may integrate well with the procedures of the IISCA. Interestingly, the previous comparison of rate-based and latency-based IISCA was conducted with participants in Brazil (Jessel et al., 2024). Therefore, this study replicated the outcomes with a culturally distinct population of individuals with autism in the United States. This helps to the support the generality of the IISCA procedures and future researchers should consider evaluating the IISCA in other countries to determine any cultural boundaries to its efficacy. In addition, future researches may want to include questions on the cultural responsiveness (Beaulieu & Jimenez-Gomez, 2022; Jimenez-Gomez & Beaulieu, 2022) of the procedures as a form of social validation.

It is important to note that, while the latency-based IISCA maintains some aspects of a compassionate care framework, this does not imply that it is the only functional analysis format to do so. Other functional analysis formats have been designed in the past with practical considerations in mind (Northup et al., 1991; Sigafoos & Saggers, 1995) in addition to the consideration of latency (Thomasson-Sassi et al., 2011) of interest in the current study. More recently, the performance-based IISCA has been introduced (Iovino et al., 2022) with experimenters describing the procedures being specifically designed to incorporate a trauma-informed framework (Jessel et al., 2024; see Rajaraman et al., 2022 for more information on the trauma-informed framework). The performance-based IISCA is conducted in a single session, and challenging behavior is measured as a count. The introduction of the evocative events serves as the test, in which challenging behavior is expected to occur, and the introduction of the synthesized reinforcers serves as the control, in which challenging behavior is expected to be abated. Furthermore, the evocative events are only introduced when the participant displays signs of calm or happiness, and the entire duration of the analysis is dependent on the participant's performance. That is, the performance-based IISCA is discontinued after 3 to 5 instances of challenging behavior, which could take as little as a few minutes (Jessel et al., 2024).

Conducting an assessment without ensuring that the resulting treatment aligns with the identified contingencies serves little purpose. This principle highlights a significant advantage of the IISCA's synthesized approach, which identifies the controlling variables and

establishes a clear pathway for designing individualized and contextually relevant treatments. By synthesizing contingencies, practitioners can develop more comprehensive and effective interventions that address all significant maintaining factors simultaneously. This method minimizes the risk of overlooking critical elements that contribute to the persistence of challenging behavior, thus enhancing the ecological validity of the intervention (Slaton & Hanley, 2018) . Moreover, this alignment between assessment and treatment embodies the principles of compassionate and trauma-informed care, prioritizing efficiency, relevance, and the reduction of unnecessary exposure to aversive or irrelevant conditions.

This is all to say that what we deem as a compassionate or trauma-informed functional analysis model is likely going to exist on a continuum and change over time with future research.

Conclusion

Using latency improved the analysis efficiency by 51% and reduced exposure to challenging behavior by 86%. This study extends the findings from prior research on the latency-based IISCA conducted with Brazilian participants to a diverse group of individuals in the United States. Results confirm that the latency-based IISCA, which incorporates many elements of a compassionate framework, to be an effective alternative to the traditional rate-based approach across cultural and demographic contexts. By focusing on the latency to the first response rather than repeated instances of challenging behavior, the latency-based IISCA significantly reduces participant exposure to evocative conditions, enhancing safety and efficiency.

Our findings demonstrated a high degree of functional correspondence between latency- and rate-based IISCAs, supporting latency as a reliable measure of functional control without compromising analytical rigor. Additionally, expert clinicians and researchers rated the latency-based IISCA highly in terms of safety, acceptability, and practical application, reinforcing its social validity within ABA and addressing calls for trauma-informed, compassionate practices in the field. Clinicians may want to consider using the latency-based IISCA when compassionate care is a concern.

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