

The Differential Reinforcement of Other Behavior for Reducing Oppositional Behavior in Emotional- Behavioral Disorder

Aufa Rizka Andini, Marlina, Rahmahtrisilvia, Safaruddin

Universitas Negeri Padang, Indonesia

aufarizkaandini@gmail.com; lina_muluk@fip.unp.ac.id

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Abstract

Challenging behaviors among students with emotional and behavioral disorders (EBD) can disrupt learning and interactions with teachers and peers. This study examined the effects of differential reinforcement of other behavior (DRO) on four challenging behaviors in one student with EBD. A single-case experimental approach employed a multiple-baseline design across behaviors, with the intervention introduced at different times for each target behavior. Behavioral frequencies were recorded during baseline (A1), DRO intervention (B), and post-intervention (A2) phases and analyzed descriptively through comparisons across phases. Mean frequencies decreased from baseline to intervention for refusal of instructions (3.60 to 2.25), verbal arguing (4.43 to 2.30), negativism/hostility (3.33 to 2.25), and verbal abuse (6.92 to 3.33). During the post-intervention phase, the corresponding mean frequencies were 2.40, 1.80, 1.75, and 3.33, respectively, remaining below baseline levels for all four behaviors. However, patterns following intervention differed: refusal of instructions increased slightly relative to the intervention phase, verbal arguing and negativism/hostility decreased further, and verbal abuse remained unchanged. DRO was therefore associated with reductions in all four target behaviors, although subsequent patterns varied across behaviors. These findings provide preliminary evidence supporting the potential of DRO for reducing challenging behaviors in students with EBD, with conclusions limited to the participant studied.

Keywords: Differential Reinforcement of Other Behavior; Challenging Behavior; Emotional and Behavioral Disorders; Single-Case Research; Special Education

INTRODUCTION

According to the DSM-5, emotional and behavioral disorders (EBD) involve enduring, repetitive, and developmentally inappropriate difficulty in regulating emotion, behavior, and social interaction, which hinders academic and social goals (Ogundele, 2018). Closely associated is Oppositional Defiant Disorders (ODD), characterized by persistent defiance, irritability, frequent arguing, and refusal to comply with rules or authority (Lin et al., 2022). Oppositional behavior has a global prevalence of approximately 3-6% among children and adolescents, with markedly higher rates among children with special needs (Barican et al., 2021); in Indonesia, approximately 9-10% of school-aged children show persistent behavioral problems associated with mental-emotional disturbance (Kementrian Kesehatan Republik Indonesia, 2018). Without intervention, such behavior may cause long-term academic and social difficulties (Kazdin, 2012), making school connectedness and emotional regulation central concerns (Raniti et al., 2022).

Emotional and Behavioral Disorders (EBD) refer to conditions characterized by persistent difficulties in emotional regulation, behavioral control, and social interaction that may interface with students academic and interpersonal functioning (M. Marlina, 2025). Students with EBD may exhibit behaviors such as defiance, irritability, verbal aggression, noncompliance, and difficulty responding appropriately to rules or social expectations (Marlina, M., Taufan, J., ES, H., & YY, 2025). These behavioral difficulties can affect classroom participation and relationships with teachers and peers, particularly when the behavior occurs frequently and interferes with the learning process (Marlina, 2018). Therefore, behavioral interventions that are systematic, observable, and based on behavioral principles are needed to help reduce inappropriate behaviors and support more adaptive patterns of behavior (M. Marlina et al., 2023).

In the classroom, oppositional behavior, manifested as refusal of instructions, verbal arguing, hostility, and abusive or aggressive language toward teachers and peers, disrupts learning, reduces concentration, and delays social and academic development. Punitive

approaches are frequently applied but prove insufficiently effective because they do not address the function of the behavior (Kazdin, 2012). Differential Reinforcement of Other Behavior (DRO) provides reinforcement contingent on the non-occurrence of the target behavior within a specified interval, without requiring a specific alternative response (Vollmer et al., 2020). Compared with Differential Reinforcement of Alternative Behavior (DRA) and of Incompatible Behavior (DI), DRO is easier to implement consistently in classrooms, non-punitive, and effective in reducing oppositional behavior (Kazdin, 2012; Larasyifa & Iswari, 2023).

Evidence for DRO is growing. Jessel and Ingvarsson (2016) concluded that DRO performs consistently well, especially when the reinforcer matches the function of the behavior, and Hangen et al. (2020) clarified the roles of extinction and reinforcement. Class-wide differential reinforcement reduced disruptive behavior at the kindergarten and primary levels (Freyssinet & Pansu, 2025; Pansu et al., 2024), and DRO was effective for challenging behavior in children with autism, although methodological rigor varied (Weston et al., 2018). In Indonesia, Susanti et al. (2024) described DRO for disruptive approach, and Brown et al., (2020) showed that the related DRA technique reduced self-injurious tantrum behavior in a child with Down Syndrome. Nevertheless, quantitative single-subject research on DRO for oppositional and verbally aggressive behavior among children with EBD, particularly in Indonesian special and inclusive elementary schools, remains scarce. This study addresses that gap with an A-B-A Single Subject Research (SSR) design, extending the operant-conditioning foundation of behavior modification (Skinner, 1967; Cooper et al., 2020) to a population that has received little single-case attention.

Other approaches include Positive Behavioral Interventions and Support (PBIS), a preventive school-wide approach (Lee & Gage, 2020); Cognitive Behavioral Therapy (CBT), associated with reduced aggression and improved emotion regulation (Kazdin, 2017); and Parent Management Training (PMT), which reduces coercive parenting practices that may reinforce oppositional behavior (Kazdin, 2005). Each, however, requires broader systemic involvement that may not be feasible for a single teacher seeking an immediate, low-resource strategy, whereas DRO can be applied directly within ordinary classroom routines. This study therefore aims to determine the effectiveness of DRO in reducing oppositional behavior, specifically verbal abuse and aggressive verbal responses, in a child with EBD, offering teachers an applicable, data-based, and non-punitive strategy.

METHODS

1. Research Design

This study used a quantitative Single Subject Research (SSR) design, which measure behavior change objectively through frequency data and focuses intensively on one participant, suiting the individualized needs of children with EBD (Marlina, 2023). Using multiple baseline across variabels design with post-intervention withdrawal/follow-up phase. The staggered arrangement was reflected in the different lengths of the initial baseline for each target behavior: five sessions dor refusal of instructions, seven for verbal arguing, ten for negativism/hostility, and thirteen for verbal abuse/aggressive verbal behavior. DRO was introduced sequentially after each behavior's baseline observations. The intervention lasted 12, 10, 8, and 6 sessions, respectively. Following the intervention, observations were conducted after DRO was withdrawn for 5, 5, 4, and 3 sessions, respectively. This description preserves the staggered intervention onset while making the additional post-intervention phase explicit.

2. Participant

The participant was a fifth-grade student at SDN 12 Padang Besi, purposively selected using four criteria; (a) identified as a child with EBD; (b) consistent oppositional behavior during classroom learning; (c) oppositional behavior that disrupted the learning process; and (d) consent from parents, teacher, and school. Assessment showed persistent oppositional behavior toward teachers and peers (reusal of instructions, verbal arguing, hostile responses, and verbally abusive or aggressive language), particularly when given directions perceived as unpleasant, together with difficulty regulating anger and low tolerance for authority. The parcipant is referred to by code.

3. Operational Definition

Oppositional behavior was operationally examined through four target behaviors; refusal of instructions, verbal arguing, negativism/hostility, and verbal ause/aggressive verbal behavior (Kiska et al., 2023). Each behavior was recorded separately as a frequency count during classroom observation. All four behaviors were included in the visual analysis; verbal abuse/aggressive verbal behavior had the highest initial baseline mean and was therefore an important outcome, but it wsa not the only behavior analyzed.

4. Data Collection

Data were collected through event recording (frequency tally) during classroom observation (Ledford & Gast, 2018). Observation periods were staggered by target behavior to match the multiple baseline across behaviors arrangement (Ledford & Gast, 2018): refusal of instructions was observed for 5 baseline sessions; negativism/hostility for 10, 8, and 4 sessions; and verbal abuse/aggression verbal behavior for 13, 6, and 3 sessions. The researcher and classroom teacher recorded behavior using previously reviewed operational definitions and recording procedures. Inter-observer agreement (IOA) was assessed in at least 30% of sessions in each phase, using agreements divided by total observations multiplied by 100%. Ethical procedures included written permission from the school principal; consent from the participant's parents and classroom teacher after an explanation of the purpose, procedures, and right to withdraw; identify coding; and secure data storage (Marlina, 2025).

5. Data Reliability and Analysis

Inter-observer agreement (IOA) was assessed in at least 30% of sessions in each phase. IOA was calculated as the number of agreements divided by the total number of observations and multiplied by 100%; agreement of at least 80% was considered acceptable. Data were analyzed using visual analysis, following SSR procedures described by (Marlina, 2023). Within- condition analysis examined condition length, data range, mean level, trend direction, and data level for each target behavior. Between-condition analysis compared the initial baseline with DRO intervention and examined the post-intervention observations, considering level change, trend change, percentage of overlap, changes in mean frequency, and whether the lower behavior levels were maintained after DRO was withdrawn. Because baseline and intervention onset were staggered across variables, interpretation also considered the pattern of change across the four behaviors rather than treating all behaviors as if they entered each phase simultaneously (Sari, L. M., & Marlina, 2021).

RESULTS

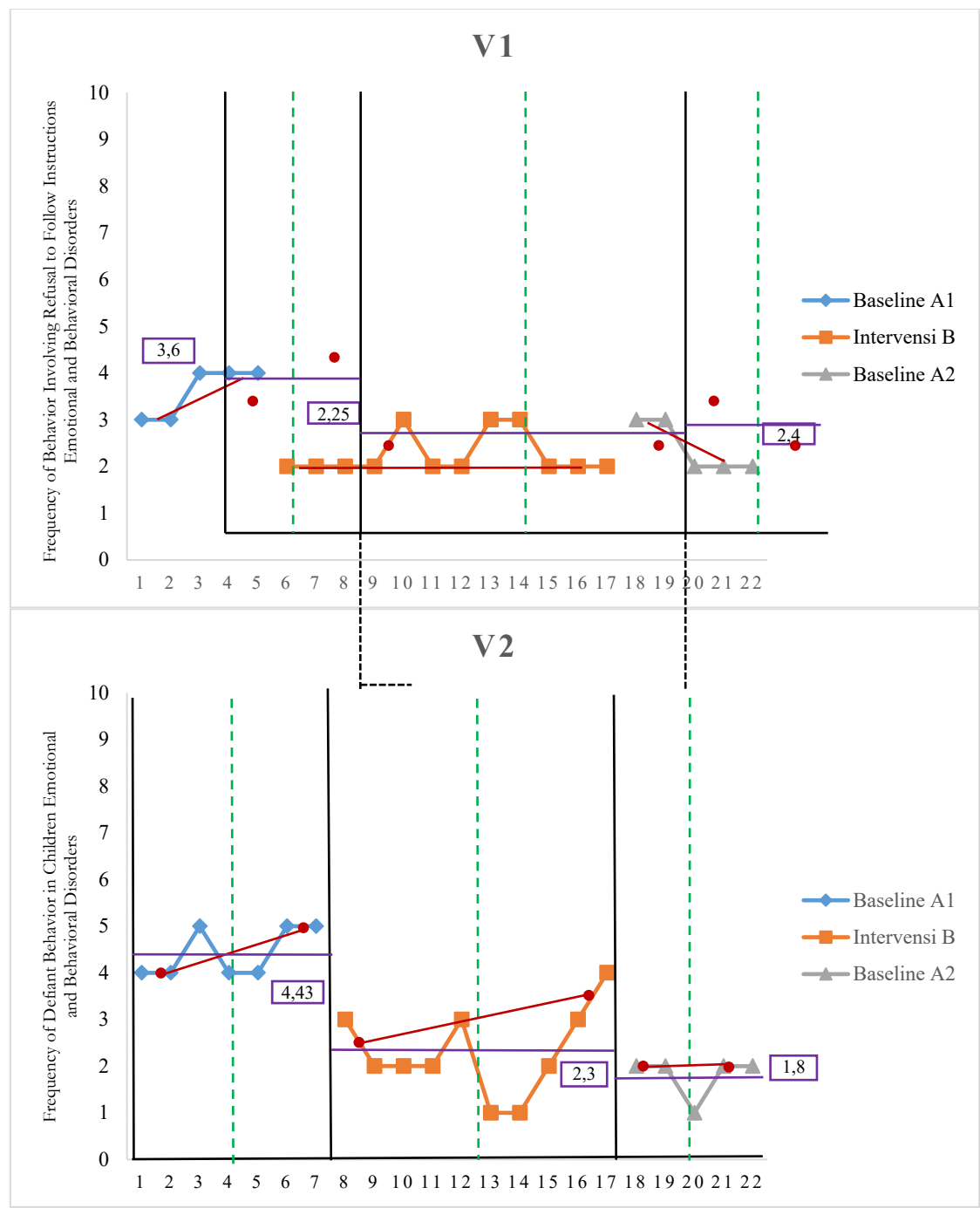
Four target behaviors were observed: refusal of instructions, verbal arguing, negativism/hostility, and verbal abuse/aggressive verbal behavior. The onset of DRO was staggered across these behaviors rather than introduced at the same session: baseline

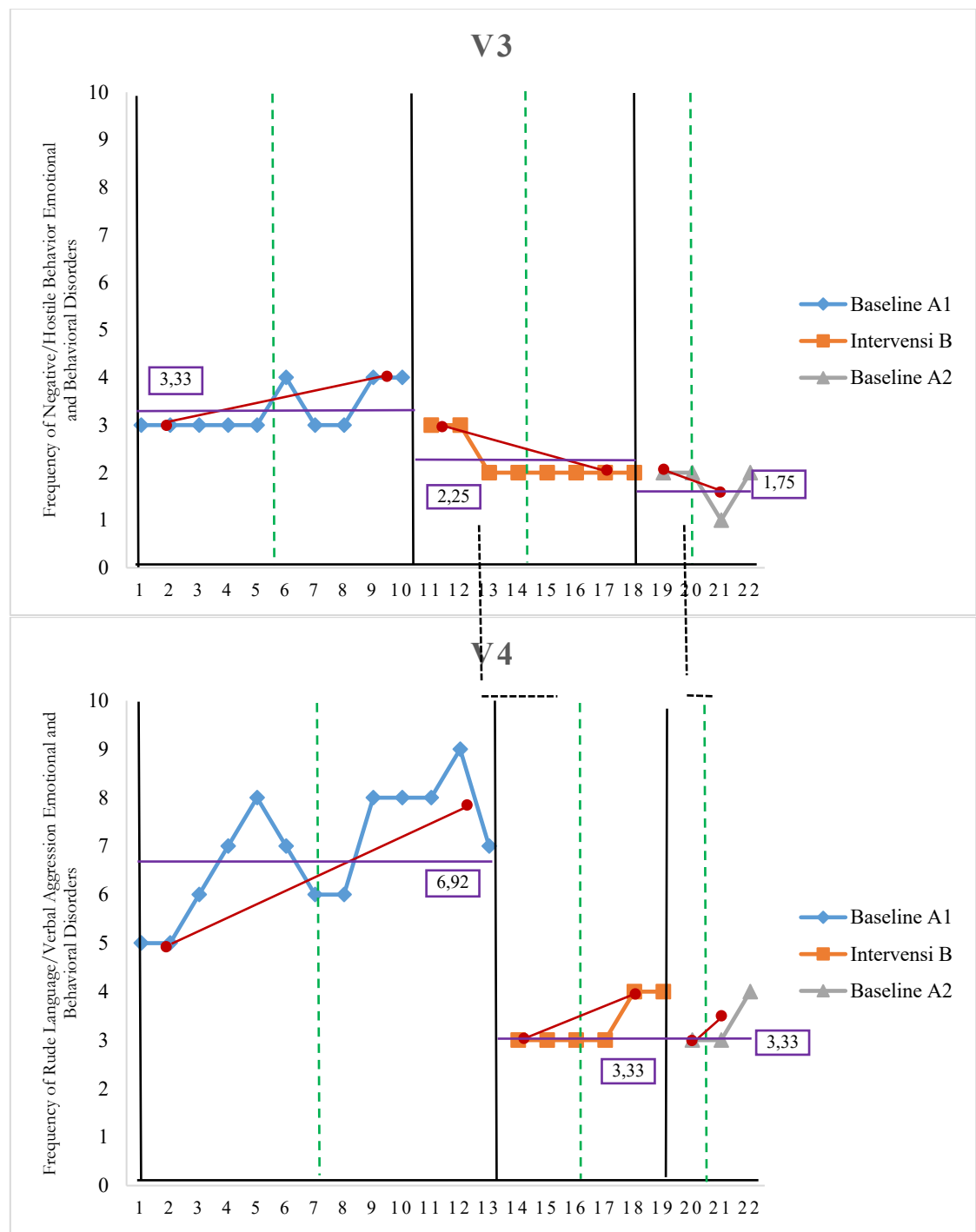
observations comprised 5 sessions for refusal of instructions, 7 for verbal arguing, 10 for negativism/hostility, and 13 for verbal aggression. The corresponding intervention phases comprised 12, 10, 8, and 6 sessions, followed by post-intervention observations of 5, 5, 4, and 3 sessions. Mean frequencies decreased from baseline to intervention for all four behaviors. The final observation phase showed that the lower mean levels were retained for verbal arguing and negativism/hostility, while refusal of instructions rose slightly and verbal aggression remained at the same mean levels for each behavior.

Table 1. Staggered Phase Lengths, Frequency Ranges, and Mean Levels across Four Target Behaviors

Phase	V1: Refusal of Instructions	V2: Verbal Arguing	V3: Negativism/ Hostility	V4: Verbal Aggression	Mean Levels (V1/V2/V3/V4)
Baseline (A1)	Sessions 1-5; range 3-4	Sessions 1-7; range 4-5	Sessions 1-10; range 3-4	Sessions 1-13; range 5-9	3.60/4.43/3.33/6.92
DRO Intervention (B)	Sessions 6-17; range 2-3	Sessions 8-17; range 1-4	Sessions 8-17; range 1-4	Sessions 14-19; range 3-4	2.25/2.30/2.25/3.33
Post-Intervention (A2)	Sessions 18-22; range 2-3	Sessions 18-22; range 1-2	Sessions 18-22; range 1-2	Sessions 20-22; range 3-4	2.40/1.80/1.75/3.33

The Graphs present visual analyses of the four target behaviors. Because the initial baseline and intervention phases began at different sessions for each behavior, phase boundaries must be read separately for each variable. The graphs are intended to show staggered introduction of DRO and the subsequent behavior patterns.





Graph 1. Within-Condition Analysis of Oppositional Behavior

Description :

Baseline A1 :

Intervensi B :

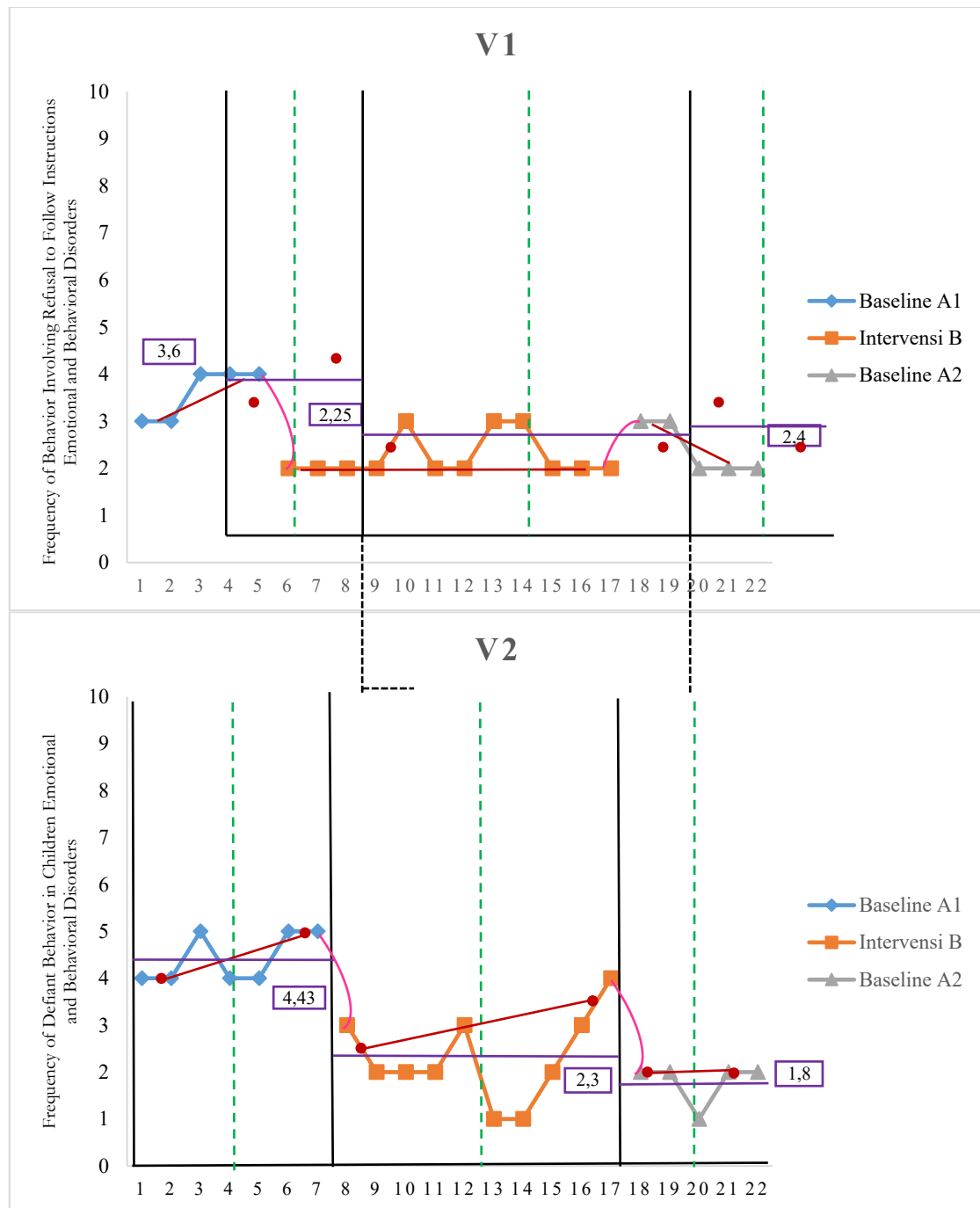
Baseline A2 :

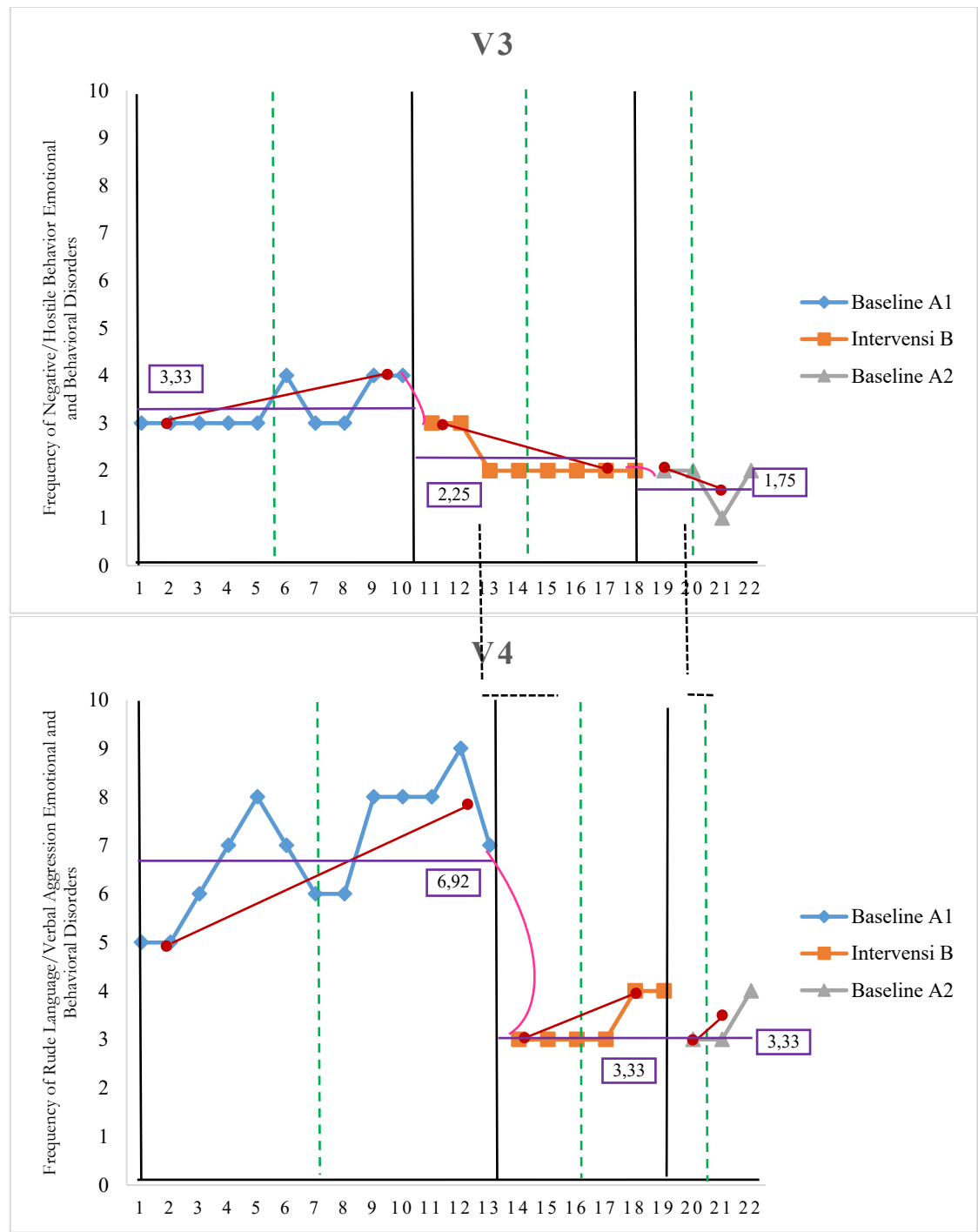
Trend : 
Mean Level : 
Split Middle : 

During the initial baseline frequencies were generally higher before DRO was introduced, with the baseline length varying by behavior. Refusal of instructions was observed for five baseline sessions (mean = 3.60), verbal arguing for seven sessions (mean = 4.43), negativism/hostility for ten sessions (mean = 3.33), and verbal aggression for thirteen sessions (mean = 6.92). Verbal aggression had the highest baseline mean. These different baseline lengths provided the staggered starting points for the intervention across the four behaviors.

After DRO was introduced sequentially, mean frequencies were lower than the corresponding baseline means for all four behaviors. Refusal of instructions was observed for 12 intervention sessions (mean = 2.25), verbal arguing for 10 sessions (mean = 2.30), negativism/hostility for 8 sessions (mean = 2.25), and verbal aggression for 6 sessions (mean = 3.33). Individual data points still fluctuated, so the findings are best described as reductions in mean frequency rather than a uniform or uninterrupted downward trend in every session.

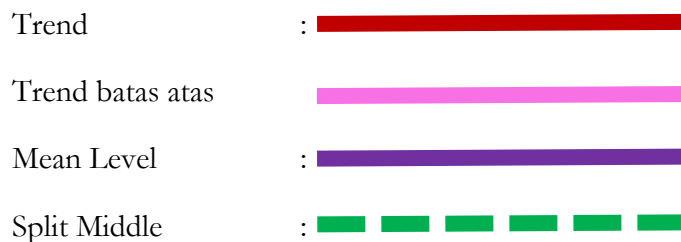
During the post-intervention observation phase, mean frequencies were 2.40 for refusal of instructions, 1.80 for verbal arguing, 1.75 for negativism/hostility, and 3.33 for verbal aggression. Compared with the intervention phase, refusal of instructions showed a slight increase in mean frequency, verbal arguing and negativism/hostility showed further decreases, and verbal aggression remained at the same mean level. Thus, the post-intervention pattern differed across behaviors, and the data do not support claiming that all four behaviors continued to decrease after DRO was withdrawn.





Keterangan :

- Baseline A1 :
- Intervensi B :
- Baseline A2 :



Comparing baseline with intervention, mean frequency decreased for all four behaviors: refusal of instructions from 3.60 to 2.25 (a decrease of 1.35), verbal arguing from 4.43 to 2.30 (a decrease of 2.13), negativism/hostility from 3.33 to 2.25 (a decrease of 1.08), and verbal aggression from 6.92 to 3.33 (a decrease of 3.59). During post-intervention observation, mean frequency was 2.40 for refusal of instructions, 1.80 for verbal arguing, 1.75 for negativism/hostility, and 3.33 for verbal aggression. Compared with intervention, these values indicate a slight increase for refusal of instructions (+0.15), decreases for verbal arguing and negativism/hostility (−0.50 each), and no change for verbal aggression (0.00). The magnitude and consistency of change therefore differed by behavior.

DISCUSSION

The reductions in mean frequency from baseline to DRO intervention across the four behaviors are consistent with the possibility that reinforcement contingent on the non-occurrence of a target behavior can support behavior change among children with EBD. The staggered introduction of DRO across behaviors change among children with EBD. The staggered introduction of DRO across behaviors is an important feature of the study design. However, the data should be interpreted cautiously: the individual series showed fluctuations, and the post-intervention phase did not show the same pattern for every behavior. In particular, the mean frequency of verbal aggression remained at 3.33 after DRO was withdrawn.

This pattern fits the two mechanisms proposed to underlie DRO: extinction consequence, and reinforcement of its absence whenever an interval passes without occurrence (Hangen et al., 2020). Over repeated intervals, the participant appears to have discriminated that refraining from verbal abuse reliably produced a more favorable outcome, consistent with operant learning principles (Skinner, 1967; Cooper et al., 2020).

The findings are consistent with literature suggesting that DRO may reduce challenging behavior across different behaviors and populations, particularly when reinforcement is functionally appropriate (Jessel & Ingvarsson, 2016; Hangen et al., 2020), with classroom studies (Freyssinet & Pansu, 2025; Pansu et al., 2024), and with Weston et al. (2018) on children with autism. The present study extends this discussion to oppositional behavior in a child with EBD and uses a staggered intervention onset across four behavior variables. Because the procedure also included a post-intervention phase after withdrawal, the results should be described in terms of the observed staggered intervention pattern and follow-up data, rather than attributing every change solely to a conventional A-B-A sequence.

All four indicators-refusal of instructions, verbal arguing, negativism/hostility, and verbal aggression showed lower mean frequencies during DRO than during their respective initial baselines. The size of the reduction differed, and the post-intervention observations were not uniform: verbal arguing and negativism/hostility decreased further, refusal of instructions increased slightly, and verbal aggression remained unchanged in mean frequency. These differences support reporting each behavior separately and avoiding a claim that the intervention produced an identical effect across all variables.

Theoretically, the results provides single-case evidence that DRO is functionally related to reduced oppositional behavior among children with EBD, extending the operant-conditioning framework (Skinner, 1967; Cooper et al., 2020). Practically, teachers gain a concrete, non-punitive, and data-based strategy, consistent with recommendations favoring reinforcement over punitive discipline (Kazdin, 2017), and schools can adopt structured, consistently implemented programs rather than ad hoc punitive responses, complementing broader school-based approaches (Sugai & Horner, 2009; Raniti et al., 2022).

Several limitations should be noted. The study involved one participant in one school which limits generalizability. The number of sessions differed across behaviors because the intervention was staggered, and the post-intervention observations were relatively brief. In addition, data fluctuated within some phases. Future research could include more participants, longer intervention and follow-up phases, and replication across settings and behavioral indicators to strengthen the evidence for the effects of DRO.

CONCLUSION

The findings indicate that mean frequencies of all four target behaviors were lower during DRO intervention than during their respective initial baselines. The intervention was introduced sequentially across behaviors, consistent with the study's multiple baseline across variables arrangement. Post-intervention observations showed different patterns: verbal arguing and negativism/hostility decreased further, refusal of instructions increased slightly, and verbal aggression remained at the intervention mean. DRO therefore appears to be a promising non-punitive strategy for reducing oppositional behavior, although the findings should be interpreted cautiously in light of a the single participant, brief follow-up, and variability in the data.

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