Salem State University
School of Graduate Studies
Department of Psychology

An Analysis of Rules that Mimic the Effects of Response Disequilibrium Contingencies

A Thesis in Behavior Analysis

by

Nickolas A. Servideo

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Abstract

This study investigated the impact of rules operating as contingency-specifying stimuli (CSS). The primary focus was on whether rules could specify a contingency that alters the functions of advertisements and videos. Integrating Relational Frame Theory (RFT) and Response Disequilibrium Theory (RDT), it was examined whether rules with comparative contextual cues mimicked the effects of response deficit contingencies. Ten Salem State University undergraduate students participated in a counterbalanced study with three baselines that preceded or followed two experimental conditions: Deficit and Rules. During each baseline phase of the study, advertisements and videos were freely available for viewing. Similarly, advertisements and videos were freely available for viewing during the Rules condition. Rules were framed comparatively across the dimensions of "more" and "better" to increase the duration of time spent viewing advertisements (e.g., "Click more Ads to see better Vids"). In the Deficit condition, a response deficit contingency was arranged to increase the viewing duration of advertisements. The results indicated that Rules had an effect that increased participants' advertisement viewing duration, which resembled the effect of the response deficit contingency. This research advances our understanding of verbally-regulated behavior changes, as the effect of rules approximated the effect of disequilibrium contingencies.

Keywords: contingency-specifying stimulus, disequilibrium theory, rule-governed behavior, pliance, tracking, relational frame theory

An Analysis of Rules that Mimic the Effects of Response Disequilibrium Contingencies

The realm of verbal behavior is a highly intricate and multifaceted area within the science of behavior. It possesses a distinctive set of concepts and terminology (Skinner, 1957), rendering it essential for us to embark on a comprehensive exploration of this field and the profound impact it wields on our actions. In particular, it is imperative to explore the dynamics of rule-governed behavior and the intricate interplay between a speaker and a listener (Zettle & Hayes, 1982). Verbal behavior permeates every facet of our lives and plays an integral role in shaping human society (Skinner, 1984). We are all active participants in the diverse verbal communities that surround us, communities that significantly shape and maintain our behaviors (Guerin, 1992). Undertaking empirical research in this domain is a valuable endeavor, as it provides us with a more comprehensive understanding of this integral part of human behavior.

According to Hayes et al. (1989), behavior analysts have engaged in extensive discussions regarding whether human animal behavior is under the control of the same variables as nonhuman animal behavior. Animal performances on schedules of reinforcement tend to exhibit consistency and replicability, both within and across nonhuman animal species, while human performances tend to deviate from those nonhuman animal trends. For instance, when verbal human subjects aged four or older respond on fixed-interval (FI) schedules, deviations from the typical FI scallop pattern of behavior are observed (Lowe et al., 1983). In describing the performance of verbal humans on FI schedules, Lowe et al. proposed the *language hypothesis*. According to this hypothesis, the development of verbal behavior plays a crucial role in human animal performance on schedules of reinforcement.

In an effort to dive deeper into these differences, Hayes et al. (1986) showed that instructions have an influence on behavior-environment relationships, demonstrating that they

have the capacity to expand or constrain the range of behaviors exhibited. For example, when participants were instructed to “Go Fast”, while on a differential reinforcement of low rate (DRL) schedule, they tended to exhibit a higher rate of responding. That is, they were not *sensitive* to the schedule requiring a low rate of responding. Conversely, participants instructed to “Go Slow”, while on a fixed-ratio (FR) schedule of reinforcement, tended to exhibit a low rate of responding. This insensitivity to the programmed schedules of reinforcement supports the language hypothesis, providing further evidence that verbal behavior contributes to the differences between human and nonhuman animal performances. Interestingly, the most sensitive participants were the ones given the instructions that “accurately” specified the schedules of reinforcement (Hayes et al., 1986). Similarly, Matthews et al. (1977) demonstrated how instructions themselves can lead to human performance mirroring that of animals.

The evidence in support of the language hypothesis suggests that instructions and rules are the variables that differentiate human from nonhuman animal performances. Based on an analysis of rules by Schlinger and Blakely (1987), the instructions in these human operant experiments may be profitably classified as contingency-specifying stimuli (CSS). Unlike discriminative stimuli, which have an evocative effect on behavior, CSSs play a unique role in altering the function of other stimuli. In accordance with Schlinger and Blakely, an example of a contingency-specifying stimulus is when a teacher instructs their students as follows: “Please enter the classroom when you notice our visitor’s arrival.” With the introduction of this CSS, the presence of the visitor undergoes a transformation of function with respect to the evoked response. Instead of merely observing the visitor upon arrival, the CSS sets the occasion for the children to return to the classroom in response to the stimulus of the visitor arriving. The CSS plays a pivotal role in altering the function of the visitor’s arrival. Importantly, the CSS does not

immediately evoke the students' behavior when it is stated. Instead, the behavior of going into the class is now under the discriminative control of the visitor arriving. The implications of CSSs are significant, especially in the context of instructions provided in human operant experiments.

According to Schlinger and Blakely (1987), rules are CSSs that mimic the effects of contingencies. In their words, "function-altering effects of CSSs provide a possible mechanism for the similarities between 'contingency-shaped' and 'rule-governed' behavior" (Schlinger & Blakely, 1987, pp. 44-45). The purpose of the current investigation was to test this function-altering mechanism to determine whether the effects of certain rules mimic the effects of certain contingencies. A two-pronged approach was used to test the proposed function-altering mechanism. Firstly, relational frame theory (RFT) was invoked to identify rules with predicted functional-altering effects. Secondly, response disequilibrium theory (RDT) was utilized to quantify the effects of rules and to compare those effects against the predictions of a disequilibrium model.

A Relational Frame Theory of Function-Altering Stimuli

In light of RFT, Hughes and Barnes-Holmes (2016) underscore the challenge of analyzing rule-governed behavior solely in direct contingency terms. They explain that Skinner (1969) did not adequately define "specify" when he said that rules are discriminative stimuli that *specify* a contingency between antecedent, behavior, and consequence. In other words, Skinner did not account for how rules become contingency-specifying stimuli when there is no history of reinforcement for the rule that is being followed. Later, Schlinger and Blakely (1987) distinguished rules from discriminative stimuli, and identified rules for their function-altering effect, but they also failed to account for how rules govern behavior when they are novel. From an (RFT) perspective, rules are CSSs because they include one or more contextual cues.

Contextual cues are verbal stimuli that bring a history of relational responding to bear on current circumstances (Hayes et al., 2001).

Hughes and Barnes-Holmes (2016) elaborate that *relating* constitutes a type of behavior where individuals respond to one event in terms of another. Contextual cues such as “same as”, “opposite”, or “different” belong to families of frames that have particular function-altering effects. For example, to say "a nickel is *bigger than* a dime, but a dime is worth *more than* a nickel” is to alter the function of the nickel relative to its size and worth (Hayes et al., 2001). “Bigger than” and “more than” are examples of contextual cues that belong to the family of comparative frames. In the current study, rules were presented to participants as comparative frames with "more" and "better" as the contextual cues. A comparative framing was selected to increase one or more dimensions of responding.

Response Disequilibrium Theory Quantifies Contingencies

Response disequilibrium theory (RDT) emerges as a valuable framework for investigating the effects of rules because contingencies can be quantified using the disequilibrium model (Jacobs et al., 2017). This framework employs a quantitative model that enables a comparison of whether the effects of rules approximate or mimic the effects of response disequilibrium contingencies. Rather than emphasizing stimulus-response or response-reinforcer relationships, RDT places its primary focus on instrumental and contingent activities. Jacobs et al. elaborate on instrumental activity as a response that creates an opportunity for engaging in another activity, while a contingent activity is one that an organism gains access to by participating in the instrumental activity. In their comprehensive examination, Jacobs et al. (2019) outline two distinct conditions capable of producing reinforcement and punishment effects. The first condition, termed *response excess*, predicts a decrease in instrumental activity, while the second, known as *response deficit*, predicts an increase in instrumental activity. These

conditions serve to either increase or decrease an individual's baseline level of behavior. The current investigation focuses on the predictive capacity of the response deficit condition. In particular, the disequilibrium model for response deficit provides a way to quantify a reinforcement contingency. If the effects of rules mimic the effects of contingencies, then we should observe outcomes similar to those observed in a deficit condition.

Mathematically, the response deficit is represented by the equation

$$\frac{I}{C} > \frac{O_i}{O_c}, \tag{1}$$

where *I* represents instrumental, *C* represents contingent, and O_i and O_c represents the organism's unconstrained instrumental and contingent activities during a paired baseline. This equation predicts that when the instrumental to contingent ratio (*I/C*) exceeds an individual's baseline ratio, instrumental activity (*I*) will increase.

An example of Equation 1 comes from Dowdy and Jacobs (2019), where they used this disequilibrium equation to increase independent seatwork in an individual with autism. In this study, independent seatwork was the instrumental activity while access to an iPad was the contingent activity. The instrumental to contingent (*I/C*) ratio in this case was 60:60 seconds. The individual's average O_i value was 101.37 s while his average O_c value was 467.37 s.

$$\frac{60}{60} > \frac{101.37}{467.37} \tag{2}$$

$$1.00 > 0.22 \tag{3}$$

As you can see in Equation 2 and 3, the *I/C* ratio was greater than the O_i/O_c ratio for this participant. Since this individual's instrumental to contingent ratio (*I/C*) exceeds his baseline

ratio it can be predicted that the instrumental activity—independent seatwork—will increase. In the current study we will use Equation 1 to quantify the ratios obtained during a condition with rules and during a condition with a deficit contingency. These obtained ratios can then be used to compare the effects of rules against the deficit contingency.

Based on the available literature, previous studies have not compared rule-governed behavior to the predictions of response disequilibrium theory. The disequilibrium model in Equation 1 can be used to investigate whether rules mimic the effects of response disequilibrium contingencies. Therefore, if rules are CSSs with contextual cues that mimic the effects of contingencies, then an increase in behavior due to a rule should approximate an increase in behavior due to a response deficit. Disequilibrium models predict the direction and magnitude of behavior change (Jacobs et al., 2017), so the question becomes whether the effect of certain rules will conform to those predictions. The research question was as follows: Does the presentation of comparatively framed rules increase the duration of time spent viewing advertisements, for undergraduate participants, in the same way that the arrangement of a response deficit increases the time spent viewing advertisements? The current study attempted to answer this question by giving participants access to advertisements and videos for their viewing. Viewing advertisements was the instrumental activity that produced access to the contingent activity of viewing videos.

Method

Participants and Setting

Ten Salem State University undergraduate students participated. Recruitment was carried out through Salem State University's SONA research participation system, and participants received a SONA research credit for their involvement. The experiment was conducted on

campus, specifically in Meier Hall's research laboratory space (MH 226). Prior to the experiment, the experimenter ensured the room was free from distractions. Participants stowed their mobile phones during the experiment.

Apparatus and Materials

The apparatus was developed and executed with the software called Psychological Python (PsychoPy; Peirce et al., 2019) and was presented to participants on a MacBook Pro (13-inch, 2017) laptop. The design of the apparatus was informed by Jacobs and colleagues' (2023) replication of Heth and Warren (1978). Participants used an external mouse to interact with on-screen options. The choices presented to participants were in the form of labeled buttons: "Ads" (4.76 by 1.27 cm) for advertisements and "Vids" (4.76 by 1.27 cm) for videos. If a participant selected the "Ads" button, the program displayed an advertisement accompanied by a yellow "Next Ad" button (6.35 by 1.27 cm) beneath it. Any Next Ad button click would replace the current advertisement with a new advertisement. If a participant selected the "Vids" button, then a TikTok video would be presented for viewing. In between these button options, on-screen text displayed a rule during certain conditions (see below). Figure 1 is a depiction of the apparatus, showing that participants had to press a "Confirm" button (4.76 by 1.27 cm) to acknowledge the rule. After confirming that they had read the rule, a "thumbs up" icon appeared along with the Ads and Vids buttons.

The study featured a total of 110 advertisements sourced from social media platforms like Twitter/X, Instagram, and Facebook. These advertisements encompassed various consumer products including food, clothing, and electronics. Additionally, the study included six TikTok videos, sourced from a YouTube channel that compiles the "best of" TikTok videos

(https://www.youtube.com/@CleanVideosYoutube). With the exception of the videos, advertisements used in the current study were the same as the ones used in Jacobs et al. (2024).

Procedure

The experiment commenced with the experimenter welcoming participants outside the research lab and escorting them to the workstation where the program was being run at a desk. Participants were provided with an overview of the study in a disclosure statement that described their voluntary participation. This disclosure did not describe the Rules condition (see below), so participants were also read a debriefing statement at the end of the study. Before starting the study, participants underwent a familiarization period to ensure they were comfortable with the computer apparatus. Once familiarized, they proceeded to the five main experimental conditions. The study consisted of three Baseline conditions, a Deficit condition, and a Rules condition. A counterbalanced ABACA experimental design was used, with participants randomly assigned to receive either the Rules condition before the Deficit condition (ABACA) or the Deficit condition before the Rules condition (ACABA). A counterbalanced design was used to mitigate the potential influence of sequence effects by ensuring that all experimental condition orders were experienced equally across participants.

Familiarization

A 3 min familiarization period was provided for participants to acclimate to the software's functionality. During this period, participants encountered on-screen text that explained the operation of the “Ads” and “Vids” buttons. The instructions were as follows: “Let's get you familiar with the setup. On the next screen you will be able to do the following: Click on 'Vids' to view video. Click on 'Ads' to view advertisements. If you understand, then press the purple button to continue getting familiar.” Participants had unrestricted access to Ads and Vids

in 5 s increments. For example, an Ads button click would produce 5 s of advertisements after which participants returned to the screen with Ads and Vids buttons for selection (Figure 1). Similarly, each Vids button click produced 5 s of video after which participants returned to the screen with Ads and Vids buttons for selection. Ads and Vids never occurred simultaneously. After becoming familiar with the buttons, participants transitioned to baseline.

Baseline

There were three separate 5 min baseline phases. Baselines preceded and followed the Deficit and Rules conditions. During the Baselines, participants' data for instrumental (O_i) and contingent (O_c) activities was collected. Ads activity was considered instrumental and Vids activity was considered contingent. This phase was the same as the familiarization phase, during which participants had unrestricted access to Ads or Vids in 5 s increments. Participants were given the following instructions before starting each Baseline: "On the next screen, you can view advertisements or videos. If you understand, then press the gold button to continue."

Deficit

In the Deficit condition, participants encountered on-screen instructions that read, "In this part of the experiment, the Vids button has been DISABLED. If you press the Ads button, you will be able to view the video after the advertisements. If you understand, then press the black button to continue." Throughout this condition, the "Vids" button remained visible but locked, preventing participants from freely accessing video. If participants clicked on the "Ads" button, then they were required to view 5 s of advertisements, immediately followed by 2 s of video. Notably, each 2 s increment of video was presented immediately after the 5 s of advertisements. After each 5 to 2 s ratio of Ads (*I*) to Vids (*C*), participants were returned to the selection screen with the Ads button and locked Vids button (Figure 1). In this condition, advertisements served

as the instrumental activity that produced access to the contingent activity of viewing video. The Deficit condition lasted for 5 min before participants were returned to Baseline.

Rules

Before entering this condition, participants encountered on-screen instructions that read: "In the next part, you will see text in the middle of the screen. Before you can view advertisements or videos, you have to press the 'Confirm' button to tell us you read the text. If you understand, then press the black button to continue." Upon clicking to continue, the condition proceeded with the presentation of an experimenter-contrived 'rule' displayed above the Confirm button (Figure 1). After clicking the Confirm button, participants were presented with the Ads and Vids buttons for selection. Similar to Baseline, Ads and Vids were freely available in 5 s increments. The only difference between Baseline and Rules was that after each 5 s increment of Ads or Vids, participants were presented with 1 of 10 experimenter-contrived rules (Figure 1).

Rules were framed comparatively, to specify that better videos would be available after viewing more advertisements. For example, "Click more Ads to see better Vids." Table 1 includes the 10 rules that were randomly presented during this Rules condition. The rules included "more" and "better" contextual cues and can be described as explicit-inaccurate-higher complexity rules provided by others (see Peláez & Moreno, 1999, for their taxonomy of rules). Rules were considered inaccurate because the videos were not affected by the number of Ads that participants viewed. Consistent with the Deficit condition, advertisements were considered the instrumental activity (*I*), while viewing video was considered the contingent activity (*C*). This Rules condition lasted 5 min before participants returned to Baseline.

Data Analysis

The primary dependent measure was the total duration of instrumental advertisement (Ad) viewing in seconds within each condition. Visual analysis was used, along with Equation 1, to interpret the effects of Deficit and Rules conditions. A secondary measure of count was taken to measure the total number of 'Next Ad' button clicks during each condition. A repeated-measures analysis of variance (ANOVA) randomization test was used to analyze any significant differences between Ad durations within Baseline, Deficit, and Rules conditions (Huo & Onghena, 2012; Jacobs, 2019).

Results

Table 2 shows the results of all participants across sequences of conditions. The participants exposed to the Deficit condition first were 188, 440, 743, 698, and 219. Compared to Baseline 1 Ad activity (M = 26, SD = 19), participants exhibited an increase in instrumental Ad activity during Deficit (M = 130, SD = 13). An increase in Ad activity was also observed in the Rules condition (M = 51, SD = 44), compared to Baseline 2 (M = 18, SD = 23). Count of Ads clicked through with the 'Next Ad' button increased from Baseline 1 (M = 27, SD = 28) to Deficit (M = 236, SD = 196). Count of Ads clicked through also increased from Baseline 2 (M = 32 , SD = 40) to Rules (M = 125, SD = 105). The highest duration of Ad viewing in Deficit, among those who experienced Deficit first, was p188 with 140 s of ad viewing. The highest duration of Ad viewing in the Rules condition was p743 with 93 s.

Participants who experienced the Rules condition first were represented in the bottom half of Table 2. These participants' average Ad activity was also greater during Rules (M = 87, SD = 35) than during Baseline 1 (M = 52, SD = 44), with a larger increase in Ad activity from Baseline 2 (M = 48, SD = 42) to Deficit (M = 118, SD = 20). Count of Ads clicked through with the 'Next Ad' button increased from Baseline 1 (M = 42, SD = 27) to Rules (M = 209, SD =

131), and from Baseline 2 (M = 81, SD = 72) to Deficit (M = 334, SD = 195). The participant with the highest duration of Ad viewing during the Rules condition was p912 with a total of 144 s of Ad viewing. In the Deficit condition the participant with the highest duration of Ad viewing was p145 with 137 s of total Ad viewing.

I/C and O_i/O_c ratios were calculated using Equation 1. Table 3 presents a comparison of these ratios in terms of total duration in seconds between the Deficit and Rules conditions. It is evident from Table 3 that all participants experienced a response deficit during the deficit condition, where *I/C* is greater than O_i/O_c (Equation 1). All participants who went through the Deficit condition first experienced a response deficit during both Deficit and Rules conditions. Notably, all participants who experienced the Rules first sequence were in a response deficit during Deficit and Rules except for p455 with an O_i/O_c ratio that was greater than their *I/C* ratio during the Rules condition. Overall, the average *I/C* ratio during the Deficit condition (M = 2.14, SD = 0.29) was larger than the average O_i/O_c ratio (M = 0.31 SD = 0.36). Similarly, in the Rules condition, the average *I/C* ratio (M = 1.40, SD = 1.47) was greater than the average O_i/O_c ratio (M = 0.29, SD = 0.38).

Figures 2-4 are graphical displays of individual data for whom there was a representative effect or no effect across sequences of conditions. Figure 2 represents p743's data as an exemplar where Ad viewing increased from Baseline 1 to Deficit and from Baseline 2 to Rules. Figure 3 represents p276's data as an exemplar where Ad viewing increased from Baseline 1 to Rules and from Baseline 2 to Deficit. Figure 4 represents p698's data as an exemplar of the Rules condition having little to no effect on instrumental Ad activity. Overall, the repeated measures ANOVA indicated a significant difference across conditions for both video ($p < 0.001$, $F = 44.5$) and Ad activity ($p < 0.001$, $F = 26.4$).

Discussion

The current findings are consistent with previous research testing the effects predicted by disequilibrium theory (Jacobs et al., 2023; Jacobs et al., 2024). The obtained ratios during both Rules and Deficit conditions indicate that all participants, with the exception of p455, experienced a response deficit in both conditions. This serves as evidence that rules possess the capability to approximate response disequilibrium contingencies. Essentially, the introduction of a specific rule produces a similar effect to creating a response deficit, which is evident by the increased duration of time spent on viewing advertisements. This observation is supported by the caparisons of participants *I/C* and O_i/O_c ratios, as it suggest that they were operating in a state of deficit during both conditions. Consequently, it can be said that rules can effectively mimic a response deficit contingency in terms of increasing a participants' advertisement viewing behavior. This indicates that a rule can be made to align with the predictions of disequilibrium theory. In particular, the presence of a comparatively framed rule increased participants' instrumental behavior similar to the Deficit condition. The comparative frame effectively specified an increase in instrumental responding with contextual cues for "better" videos after viewing "more" Ads.

Through observing Table 2, it is evident that the average Ads clicked through increased in both conditions compared to the average of their respective preceding baselines. Notably, all participants showed an increase in their Next Ad button clicks from their preceding baselines in both Deficit and Rules conditions. This observed increase may indicate that participants engaged in tracking (Zettle & Hayes, 1982), where they monitored whether increased Ad viewing or clicking led to better videos or not. Additionally, participants may have engaged in adjunctive behavior (Falk, 1971), which refers to behaviors that emerge as a byproduct of the reinforcement

schedule rather than being directly reinforced themselves (Pierce & Cheney, 2017). Furthermore, the increase in Ad viewing could potentially be attributed to pliance (Zettle & Hayes, 1982), where participants adhere to a rule because their behavior is influenced by potential consequences mediated by the experimenter. Participants may have increased their Ad viewing to avoid potential punishment from the experimenter for not adhering to the provided rules.

In this study, the rule operates in accordance with Schlinger and Blakely's (1987) concept of a contingency-specifying stimulus (CSS), effectively altering the function of advertisements as a stimulus. This aligns with the observation of Hayes et al. (1986), who emphasized that instructions have the ability to either expand or constrain the range of behaviors governed by programmed contingencies. Despite having unrestricted access to the "Ads" and "Vids" buttons in the Rules condition, participant behavior remained under the influence of the presented rules, which aimed to specify an increase in their Ad viewing. This demonstrates participant insensitivity to the programmed contingency. The comparatively framed rules—instructing participants to allocate "more" time to viewing Ads to gain "better" videos—appeared to have the effects predicted by a relational frame theory (RFT) account of contingency-specifying stimuli (Hughes & Barnes-Holmes, 2016). It was only after the experiment, during the debriefing phase, that participants were informed that the rules were not accurate and had no effect on video quality. This finding aligns with those of Hayes et al., illustrating that individuals adhere to rules even when they are inaccurate and ineffective in producing consequences specified by a rule.

This study serves as a compelling demonstration of how we can effectively utilize the disequilibrium model to explore the effects of rules on behavior. It underscores the importance of disequilibrium theory and its predictive capability regarding the direction and magnitude of behavior change (Jacobs et al., 2023). By offering insight into rules and their capacity to

approximate contingencies, this model provides a pathway for understanding the influence of verbal stimuli on our actions. The findings highlight the pivotal role of verbal behavior, particularly in the realm of rules and instructions, in shaping and maintaining human behavior. Furthermore, this study advances our understanding of the impact that rules exert on our behavior, paving the way for further investigations into verbal behavior through experimental analyses leveraging the unique characteristics of the disequilibrium model.

This study holds significant social relevance as it highlights the role of rules and instructions in changing human behavior, displaying their potential as powerful tools for behavioral control. This emphasizes the need for researchers to meticulously consider the implications of these verbal phenomena. Guerin's (1992) call for behavior analysts to engage with social phenomena through the analysis of verbal behavior gains added relevance, emphasizing the necessity to unveil the intricate dynamics of social control within verbal communities. The current findings suggest that rules wield influence on behavior, prompting individuals to adhere to them even when inaccurate. For instance, if an individual operates under a self-rule of "worthlessness," then this rule could render the individual insensitive to the contingencies around them that indicate otherwise (Hayes et al., 2001).

While the current study replicates the Deficit condition effect observed in Jacobs et al. (2024), it has similar limitations. One of those limitations is the absence of visually monitoring participants. Such monitoring could result in greater pliance, but could provide further information on whether participants were actively engaged with the apparatus and orienting toward the screen throughout the experiment. Additionally, it cannot definitively be determined whether participants were clicking the Next Ad button as a form of tracking the rule or as a form of adjunctive behavior. Future research could have participants rate the videos, along the

dimension quality, throughout the experiment. Video quality ratings could indicate whether participants are tracking the specifications of the rules or doing something else. Another consideration for future research would be to conduct a preference assessment beforehand. The preference assessment could be used to identify advertisements and videos that participants are more or less likely to engage with during Deficit and Rules conditions. A known preference for certain advertisements or videos could facilitate the effects observed in Deficit and Rules conditions.

In conclusion, this study sheds light on the intricate dynamics of behavioral control through rules, showcasing their influence on human behavior. By utilizing the disequilibrium model, valuable insights into how rules approximate disequilibrium contingencies, and expand or constrain the range of participant behavior has been gained. Moving forward, it is important that rules and verbal behavior get the attention they deserve from researchers. For instance, parallels between the current research and Milgram's (1963) seminal experiments on obedience could be explored in terms of pliance. Further exploration into such verbal regulation, in conjunction with disequilibrium models, holds promise for unraveling the complexities of social control within verbal communities. Despite certain limitations, this study paves the way for future research aimed at examining the relationship between contingency-regulated and verbally-regulated human behavior.

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Table 1

Comparatively Framed Rules Presented within the Rules Condition

Click more Ads to see better Vids.
View more Ads to see better TikTok Vids.
The more Ads you see the better the TikTok Vids will be.
If you view more Ads, then you will see better Vids.
Viewing more Ads will make your TikTok Vids better.
TikTok Vids are better with more Ads.
Better TikTok Vids follow more engagement with Ads.
Make your TikTok Vids better by clicking through more Ads.
TikTok Vids are better quality after viewing more Ads.
If you want better TikTok Vids, then view more Ads.

Table 2

Total Duration (s) of Video (V) & Advertisements (A) Activated by Participants & Count of Next Ad Button Clicks (C)

Participant	Baseline 1			Deficit			Baseline 2			Rules			Baseline 3		
	V	A	C	V	A	C	V	A	C	V	A	C	V	A	C
188	165	38	32	58	140	132	185	4	11	60	79	153	189	10	8
440	185	19	10	60	139	161	164	36	58	87	77	246	204	0	0
743	130	53	74	54	119	207	132	50	89	47	93	196	159	14	53
698	192	9	8	61	114	579	201	0	0	155	4	16	194	8	33
219	188	9	12	58	139	100	185	0	0	150	3	15	174	8	27
Mean	172	26	27	58	130	236	174	18	32	100	51	125	184	8	24
SD	26	19	28	3	13	196	26	23	40	50	44	105	18	5	21
	Baseline 1			Rules			Baseline 2			Deficit			Baseline 3		
	V	A	C	V	A	C	V	A	C	V	A	C	V	A	C
145	107	100	75	55	64	147	113	84	191	58	137	178	175	12	26
276	185	13	24	55	96	360	194	7	33	60	115	513	193	7	33
455	100	101	66	80	76	49	88	96	50	54	134	73	95	90	55
508	155	27	32	75	57	160	167	8	16	54	87	436	170	0	0
912	180	21	15	28	144	329	155	45	117	62	118	468	195	3	18
Mean	145	52	42	59	87	209	143	48	81	58	118	334	166	23	26
SD	40	44	27	21	35	131	43	42	72	4	20	195	41	38	20

Table 3

Comparison of Ratios in Duration of Seconds between Deficit and Rules

Participant	Deficit			Rules		
	I/C	>	Oi/Oc	I/C	~	Oi/Oc
Deficit 1st						
188	2.40	>	0.23	1.33	>	0.02
440	2.30	>	0.10	0.89	>	0.22
743	2.19	>	0.41	1.98	>	0.38
698	1.86	>	0.05	0.02	>	0.00
219	2.40	>	0.05	0.02	>	0.00
Rules 1st						
145	2.35	>	0.75	1.17	>	0.93
276	1.91	>	0.04	1.75	>	0.07
455	2.48	>	1.10	0.95	<	1.01
508	1.62	>	0.05	0.76	>	0.18
912	1.90	>	0.29	5.18	>	0.11
Mean	2.14	>	0.31	1.40	>	0.29
SD	0.29		0.36	1.47		0.38

Figure 1

The top row is a depiction of trials during baseline and deficit. The bottom row is a depiction of trials during the rules condition.

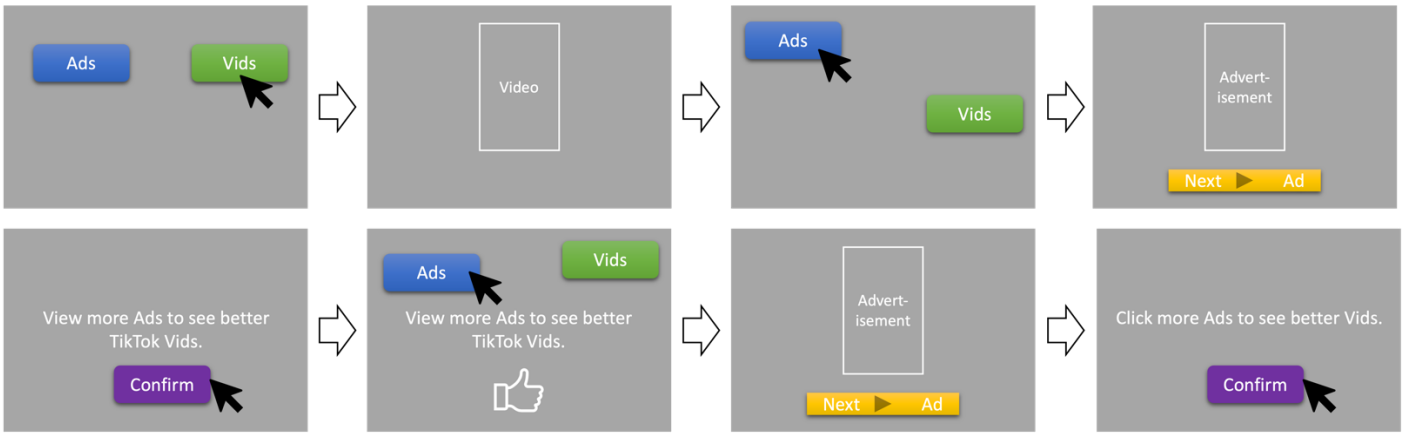

Figure 2

Total duration (s) of Vids and Ads activity across conditions for p743. Bars represent count of Next Ad button clicks on the secondary axis.

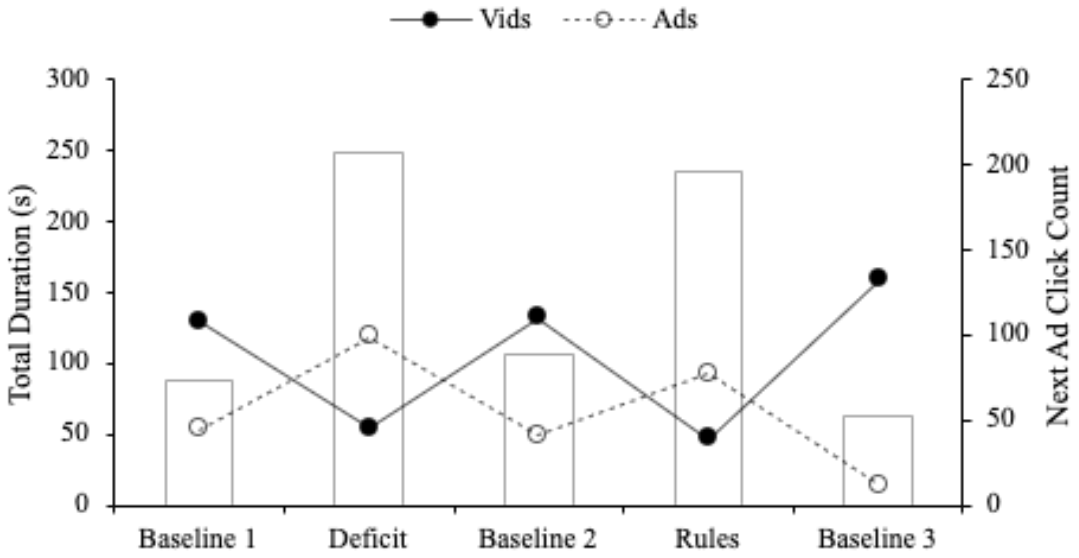

Figure 3

Total duration (s) of Vids and Ads activity across conditions for p276. Bars represent count of Next Ad button clicks on the secondary axis.

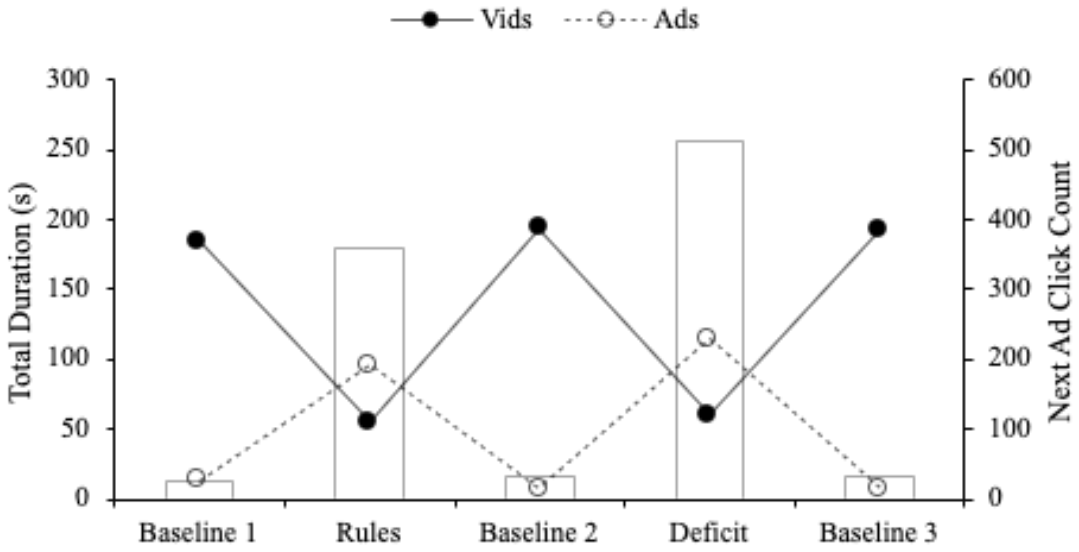

Figure 4

Total duration (s) of Vids and Ads activity across conditions for p698. Bars represent count of Next Ad button clicks on the secondary axis.