

The Role Of Operant Conditioning In Enhancing Learning Outcomes In Social Studies Education

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Abstrak

Penelitian ini dilatarbelakangi oleh rendahnya minat belajar siswa terhadap mata pelajaran IPS, yang sering dianggap teoritis, membosankan, dan kurang relevan dengan kehidupan sehari-hari yang disebabkan oleh kurangnya motivasi dan keterlibatan aktif siswa dalam proses pembelajaran. Tujuan dari penelitian ini adalah untuk mengetahui efektivitas integrasi pendekatan *operant conditioning* dalam pembelajaran IPS terhadap peningkatan prestasi akademik siswa. Metode yang digunakan adalah eksperimen semu dengan desain *Non-Equivalent Control Group Design*, melibatkan dua kelas sebagai kelompok eksperimen dan kontrol pada tingkat sekolah menengah pertama. Kelompok eksperimen mendapatkan perlakuan berupa pembelajaran berbasis *reward and punishment* sesuai prinsip *operant conditioning*. Hasil penelitian menunjukkan bahwa terdapat peningkatan signifikan dalam prestasi akademik siswa pada kelompok eksperimen dibandingkan kelompok kontrol. Temuan ini menunjukkan bahwa strategi penguatan dalam pembelajaran IPS mampu meningkatkan motivasi belajar dan hasil akademik siswa. Implikasi dari penelitian ini menunjukkan pentingnya pendekatan psikologis dalam strategi pembelajaran, di mana guru dapat mengadopsi prinsip-prinsip *operant conditioning* untuk menciptakan lingkungan belajar yang kondusif dan mendorong pencapaian akademik yang lebih optimal.

Kata kunci: operant conditioning, reward and punishment, ilmu pengetahuan sosial, siswa

Abstract

This research addresses the problem of students' low interest in social studies, which is often perceived as overly theoretical, monotonous, and lacking relevance to everyday life. These perceptions contribute to low motivation and limited student participation during learning activities. The purpose of this study is to examine the effectiveness of integrating an operant conditioning approach into social studies learning to improve academic achievement. The study employed a quasi-experimental method with a pretest-posttest control group design, involving two junior high school classes. The experimental group received treatment through the application of reward and punishment strategies based on operant conditioning principles, while the control group underwent conventional instruction. Results showed a significant increase in academic achievement in the experimental group compared to the control group. These findings indicate that reinforcement-based learning can effectively enhance students' motivation and academic performance in social studies. The implication of this study highlights the value of incorporating psychological approaches into teaching strategies. Applying operant conditioning can help teachers create a more conducive and engaging learning environment, encouraging student participation and supporting better learning outcomes. Therefore, behaviorist strategies, particularly reinforcement, are recommended as a practical approach to address motivational issues in social studies education.

Keywords: operant conditioning, reward and punishment, social studies subjects, student

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INTRODUCTION

Education plays a crucial role as the driving force of social transformation and character development of a nation (Anggraini et al., 2025). Through education, individuals not only acquire knowledge and skills but also develop values, attitudes, and social responsibilities (Marsendi et al., 2024; Ratnasari & Nugraheni, 2024). However, the quality of education in Indonesia continues to face significant challenges, particularly regarding the effectiveness of the learning process (Mea, 2024). Low student motivation, limited engagement in learning activities, and suboptimal academic achievement remain persistent issues. Results from the 2022 Programme for International Student Assessment (PISA) reveal that Indonesia ranked 68th out of 81 countries, with a decline in scores across all domains, indicating inadequate student competencies (Ratnasari & Nugraheni, 2024).

One of the critical issues in education that demands particular attention is the effectiveness of Social Studies (Ilmu Pengetahuan Sosial, or IPS) instruction at the junior secondary school level. As an integrative subject, Social Studies combines elements from various social science disciplines to develop students' competencies in understanding social structures, interaction processes, and social change. Social Studies plays a strategic role in shaping students' national insight and social awareness (Naumira et al., 2024). However, in practice, it is often perceived as boring, overly theoretical, and irrelevant to real-life situations (Lestari et al., 2024). This perception has led to students' low interest, passive participation, and unsatisfactory academic performance. Maskuroh (2023) found that Social Studies learning contributes to the development of critical thinking skills and student responsibility. Similarly, Harahap et al. (2023) highlight its potential in fostering character education, including critical thinking, tolerance, cooperation, social responsibility, and cognitive skills.

Although various teaching methods have been implemented (Wicaksono & Purnomo, 2021), they have not yielded significant results, largely due to their failure to accommodate students' diverse learning styles. Therefore, a more contextual, participatory, and psychologically grounded instructional strategy is necessary. In this regard, the application of operant conditioning theory particularly a model based on a system of rewards and punishments offers promising potential to enhance student motivation and engagement in Social Studies learning. This model is relevant for both quantitative research, in assessing its impact on learning outcomes, and qualitative research, in exploring students' responses to reinforcement mechanisms applied in the classroom (Abadi et al., 2025).

Operant conditioning theory, developed by B.F. Skinner, posits that behavior can be modified through consequences that follow a particular action (Abadi et al., 2025). These consequences may take the form of rewards or punishments (Hu, 2024). According to Skinner (2013), human behavior is influenced by stimuli both direct and indirect such that an individual's responses are shaped by environmental consequences. This theoretical foundation underpins the operant conditioning model of learning, wherein students' academic behavior is shaped through consistent application of positive reinforcement (rewards) and corrective feedback (punishments). In educational settings, this model seeks to cultivate positive student behaviors by rewarding desirable actions and discouraging undesirable ones, thereby making learning more effective and goal-oriented (Abadi et al., 2025).

Previous studies have explored various instructional models for teaching Social Studies, including guided inquiry (Meli, 2017) and socio-drama approaches (Suryani, 2023). Some researchers have also emphasized the importance of technology integration and interactive media in enhancing the quality of Social Studies education (Ali et al., 2024). However, few studies have specifically examined the application of operant conditioning-

based learning models, using a reward and punishment system, within the context of Social Studies instruction at the junior secondary level particularly in urban areas such as Surabaya. Moreover, existing literature tends to focus primarily on theoretical discussions about student motivation, with limited empirical analysis of how reinforcement strategies directly affect learning outcomes. Thus, this study seeks to address this gap by integrating participatory, systematic, and practical elements into the Social Studies learning process. The primary objective of this research is to examine the effect of an operant conditioning-based instructional model, grounded in reward and punishment mechanisms, on student learning outcomes in junior secondary-level Social Studies. This study aims to complement previous research by offering a practical application of Skinner's reinforcement theory within the instructional design of Social Studies. Unlike earlier studies, this research emphasizes the empirical validation of a behaviorist approach through a structured and data-driven teaching intervention.

This study is based on the hypothesis that the implementation of a reward and punishment-based learning model significantly enhances student achievement in Social Studies at the junior secondary level. Rooted in Skinner's principle of behavioral reinforcement, this model assumes that student responses to learning activities can be positively shaped through consistent application of consequences (Oktari et al., 2023; Prastiwi et al., 2024). Therefore, this research aims to demonstrate that structured behavioral interventions can increase student engagement and directly improve academic outcomes in Social Studies

RESEARCH METHOD

This study adopts a quantitative approach, aiming to analyze theoretical frameworks, present empirical evidence, and identify relationships between variables to enhance the understanding of a particular educational concept. The research employs a quasi-experimental design, specifically Non-Equivalent Control Group Design, which allows the researcher was unable to conduct randomization of the research participants into the experimental and control groups. This design is particularly suitable for accurately evaluating the effectiveness of an intervention (Schumacker & Holmes, 2022).

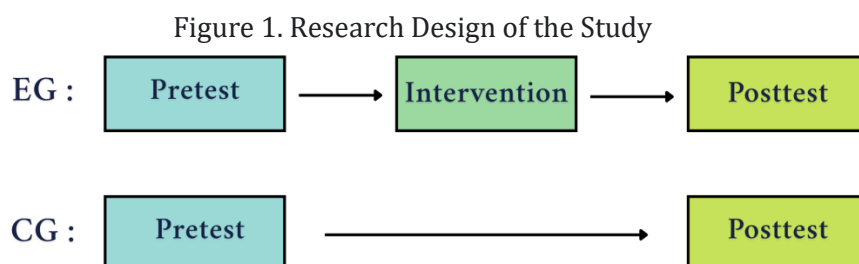
1. Population and Sample

The population in this study consists of all eighth-grade students at SMP YPM 3 Taman, Sidoarjo City, East Java Province, during the even semester of the 2025/2026 academic year. The sample was selected using purposive sampling, a technique that involves selecting subjects based on specific criteria relevant to the research objectives (Sahir, 2021). The selection criteria were as follows: (1) students who actively participate in the Social Studies (IPS) learning process in accordance with the current curriculum; and (2) students with relatively equal levels of intelligence. The selected participants were evenly divided into two groups: an experimental group (28 students) and a control group (28 students).

2. Procedure

The study began with a pre-experimental stage that included several key activities, such as administering a pre-test to measure students' baseline understanding of Social Studies. The researcher developed a procedure for implementing the operant conditioning learning model based on reward and punishment principles, integrated with the topic of local economic potential, and coordinated with the classroom teacher to act as a blind experimenter to reduce potential bias during the intervention. During the experimental phase, students in the experimental group received treatment in the form of the operant conditioning learning model focused on the topic of economic potential of the environment, a key component of the Social Studies curriculum. The rewards given included verbal praise,

small tokens, and symbolic awards, while punishments involved verbal warnings, reflective assignments, and temporary removal from the classroom setting. Following the intervention, students were administered a post-test to evaluate their improvement and comprehension of the material. The comparison between the pre-test and post-test scores serves as the basis for determining the effectiveness of the implemented instructional model. The experimental framework is illustrated in Figure 1.



3. Data Collection Techniques

The data collection in this study relied on pre-test and post-test questionnaires, developed based on the Merdeka Belajar Curriculum for eighth-grade Social Studies. The tests used a multiple-choice format, in which participants were asked to choose the most appropriate answer from four options. The primary instrument was a student learning test, administered twice (pre-test and post-test) to measure the students' understanding of the topic. The test items were adapted from the competency assessments found in the Social Studies instructional modules. The pre-test and post-test used the same set of test items, as they were intended to directly measure improvement in comprehension based on repeated exposure to the same indicators. Although this approach may introduce potential practice effects, it was controlled through time intervals and reinforcement-based instructional design.

To ensure the quality of the instrument, both validity and reliability tests were conducted. Content validity was established through expert judgment involving two Social Studies curriculum specialists and one educational measurement expert, who evaluated the test items based on their relevance to the learning indicators in the curriculum. The Content Validity Index (CVI) for the instrument was calculated at 0.89, indicating high content validity. Additionally, a try-out test was conducted on a sample of 26 students outside the research group to test empirical validity and reliability. The item-total correlation using Pearson's r showed that 24 out of 30 items had correlation coefficients above 0.30, indicating that most items were valid. The reliability of the instrument was measured using the Kuder-Richardson Formula 20 (KR-20) for dichotomous items, yielding a coefficient of 0.82, which falls within the high reliability category. These results confirm that the instrument was both valid and reliable for assessing students' learning outcomes in Social Studies.

4. Data Analysis Techniques

Quantitative data were obtained through the administration of the pre-test and post-test. Each test item was scored and totaled to generate individual achievement scores, which were then converted into percentages to assess students' learning outcomes. The data were analyzed using a series of statistical tests, including normality testing, homogeneity testing, and hypothesis testing via the independent sample t -test. All statistical analyses were conducted using SPSS 25 to ensure the accuracy and reliability of the results.

RESULTS AND DISCUSSION

The results and discussion in this study are presented systematically to provide a clear and comprehensive overview of the research findings. This section aims to elaborate on the collected data in depth and to connect the findings with relevant theories and prior research.

1. Characteristics of Research Data

The data analyzed in this study were collected from 62 respondents who met the eligibility criteria for inclusion. The demographic composition is categorized based on gender, as presented in Table 1. The majority of respondents in this study were female, comprising 57.1% of the total sample. A summary of the participants' demographic characteristics is shown in Table 1.

Table 1. Respondent Characteristics Based on Gender

Gender	Frequency	Percentage
Female	32	57,1%
Male	24	42,9%
Total	56	100%

2. Description of Research Data

Referring to the descriptive findings, a general overview was obtained regarding the pre-test and post-test scores from both the experimental and control groups. For the experimental group, pre-test scores ranged from a minimum of 40 to a maximum of 84, with a mean score of 65.57. Meanwhile, post-test scores ranged from a minimum of 64 to a maximum of 96, with a mean score of 77.57. In contrast, the control group obtained pre-test scores ranging from a minimum of 48 to a maximum of 80, with a mean score of 64.93. The post-test scores for this group ranged from a minimum of 60 to a maximum of 88, with a mean score of 73.21. A more detailed summary of these variables is presented in Table 2.

Table 2. Descriptive Statistics of Pre-Test and Post-Test Scores

Group	Tes	N	Min	Max	Mean	Std. Deviation
Experiment	Pretest	28	40	84	65,57	11,539
	Posttest	28	64	96	77,57	7,876
Control	Pretest	28	48	80	64,93	8,700
	Posttest	28	60	88	73,21	6,828

a. Normality Test

The results of the normality test in this study indicate that the data for each group and measurement stage meet the assumption of normal distribution. In the experimental group, the Shapiro-Wilk significance value for the pre-test was 0.320, while for the post-test it was 0.116. Meanwhile, in the control group, the significance values were 0.489 for the pre-test and 0.595 for the post-test. All significance values exceed the threshold of 0.05, indicating no

significant deviation from normal distribution in all four datasets. Therefore, it can be concluded that the data obtained both before and after the intervention in both groups fulfill the assumption of normality. This result implies that the dataset is suitable for further analysis using parametric statistical techniques.

Table 3. Results of Normality Test

		Shapiro-Wilk			
		Statistic	Df	Sig.	Distribution
Experiment	Pretest	0,958	28	0,320	Normal
	Posttest	0,941	28	0,116	Normal
Control	Pretest	0,966	28	0,489	Normal
	Posttest	0,971	28	0,595	Normal

b. Homogeneity Test

Based on the results of the Levene's test, the significance value was 0.112 for the pre-test and 0.528 for the post-test. Both values are greater than 0.05, indicating that the variances between the two groups are homogeneous. Therefore, it can be concluded that the assumption of homogeneity of variances is met, and the data are suitable for further analysis using parametric statistical tests.

Table 4. Results of Homogeneity Test

		Test of Homogeneity of Variance			
		Levene Statistic	df1	df2	Sig.
Pre test	Based on Mean	2,615	1	54	0,112
Post test	Based on Mean	0,404	1	54	0,528

c. Hypothesis Testing

Based on the analysis results, the significance value (Sig. 2-tailed) obtained was 0.815, which is greater than the threshold of 0.05. This indicates that there is no significant difference between the experimental and control groups at the pre-test stage. Thus, it can be concluded that the initial conditions between the two groups were equivalent, allowing the treatment to be administered without any initial bias influencing the expected outcomes.

Table 5. Hypothesis Testing Prior to Intervention

Independent Sample t-Test						
Levene's Test for Equality of Variances						
		F	Sig.	t	df	Sig. (2-tailed)
Pre Test	Equal variances assumed	2,615	0,112	0,235	54	0,815
	Equal variances not assumed			0,235	50,202	0,815

An Independent Samples t-Test was conducted to determine whether there was a significant difference between the experimental and control groups after the treatment (post-test). The results of the analysis revealed a significance value (Sig. 2-tailed) of 0.031, which is less than the threshold of 0.05. Therefore, it can be concluded that there is a statistically significant difference between the experimental and control groups in the post-test results. This finding indicates that the treatment given to the experimental group had a meaningful impact on the measured outcomes compared to the control group, which did not receive the intervention.

Table 6. Hypothesis Testing After the Intervention

Independent Sample t-Test						
Levene's Test for Equality of Variances						
		F	Sig.	t	df	Sig. (2-tailed)
Post Test	Equal variances assumed	0,404	0,528	2,212	54	0,031
	Equal variances not assumed			2,212	52,935	0,031

The classification of Normalized Gain (N-Gain) scores, as proposed by Hake serves as a benchmark to evaluate the effectiveness of educational interventions (Miller et al., 2020). A high N-Gain score indicates a substantial improvement in student learning outcomes as a result of the instructional treatment applied. The calculation of N-Gain reflects the extent to which students have progressed from their initial level of understanding (pre-test) to their level after instruction (post-test).

Table 8 .Presents the categories of N-Gain values

N-Gain Value	Category
$g > 0,7$	High
$0,3 \leq g \leq 0,7$	Moderate
$g < 0,3$	Low

The N-Gain calculation was conducted to measure the improvement in learning outcomes within each group. Based on the analysis results, the average N-Gain score for the experimental group was 0.3185, which falls into the moderate category, while the control group obtained an average score of 0.2069, classified in the low category. This finding indicates that the improvement in learning outcomes among students in the experimental group was higher than that of the control group. Accordingly, it can be concluded that the instructional treatment applied to the experimental group was more effective in enhancing learning outcomes compared to the traditional instruction received by the control group.

Table 9. Average N-Gain Scores in Each Group

Statistics			
		Experiment	Control
N	Valid	28	28
	Missing	28	28
Mean		,3185	,2069
Std. Error of Mean		,05101	,04523
Median		,3875	,2792
Mode		-,14 ^a	-,13 ^a
Std. Deviation		,26990	,23933
Variance		,073	,057
Skewness		-,581	-,802
Std. Error of Skewness		,441	,441
Kurtosis		-,276	-,092
Std. Error of Kurtosis		,858	,858
Range		1,05	,90
Minimum		-,25	-,40
Maximum		,80	,50
Sum		8,92	5,79

This study aimed to examine the effectiveness of a learning model grounded in the principles of operant conditioning in enhancing students' learning outcomes in Social Studies. The results indicated that students in the experimental group, who received instruction based on reinforcement strategies, exhibited a notable improvement in their academic performance compared to the control group, which was taught using conventional methods. The use of pre-test and post-test measurements ensured that any

observable changes in the experimental group were attributable to the intervention and not to initial differences between groups.

The statistical findings, particularly the significant difference in post-test scores ($p < 0.05$) and the higher N-Gain value in the experimental group, empirically verify Skinner's operant conditioning theory. These results support the theoretical assumption that consistent reinforcement strengthens desirable learning behaviors and enhances students' academic performance. Thus, the empirical evidence obtained in this study validates the core behavioral principle proposed by Skinner (2013).

Prior to the intervention, both the experimental and control groups were subjected to the same pre-test instrument. The results of this initial assessment confirmed that there were no statistically significant differences in baseline knowledge between the groups. This equivalence in initial performance supports the internal validity of the study by demonstrating that the groups were comparable before the treatment was introduced. Consequently, the observed post-test differences can be interpreted as the direct effect of the instructional intervention applied to the experimental group.

The post-test analysis revealed a significant improvement in learning outcomes among students in the experimental group. While the average post-test scores of both groups did not differ drastically in absolute terms, the relative gain observed in the experimental group measured by comparing pre- and post-test performance was considerably higher. This improvement reflects the efficacy of operant conditioning techniques in fostering meaningful learning experiences. In line with Skinner's (2013) theory of operant conditioning, learning is conceptualized as a change in behavior that results from the consequences of specific actions. In the classroom setting, students' responses such as active participation, correct answers, or diligent completion of assignments were met with positive reinforcement in the form of praise, points, and symbolic rewards. This reinforcement served as a motivational tool, reinforcing desirable learning behaviors.

Throughout the implementation of the intervention, reinforcement strategies were systematically applied. Students who demonstrated initiative, focus, or cooperative behavior were acknowledged through verbal praise and tangible rewards such as stickers or small prizes. These strategies increased students' intrinsic motivation to engage with the material (Abadi et al., 2025). Moreover, they reinforced a positive feedback loop: students who were rewarded for active learning behavior became more likely to repeat those behaviors in future lessons. This cycle is consistent with the behavioral learning model, where behaviors followed by reinforcing stimuli are more likely to recur.

On the contrary, students who displayed disruptive or passive behavior were subject to mild corrective actions, such as verbal reminders or task repetition. These forms of negative reinforcement or punishment were intended not to discourage the learner but to prompt self-regulation and accountability. The differential use of reinforcement and punishment based on students' classroom behavior appeared to guide the group toward more constructive and focused academic engagement.

The benefits of operant conditioning observed in this study are not limited to cognitive outcomes. Affective and behavioral dimensions of student learning also showed signs of improvement. During classroom observations, students in the experimental group were noticeably more enthusiastic and participatory compared to their counterparts. Several students who were previously disengaged became more attentive when reinforcement mechanisms were consistently applied. This finding aligns with prior research conducted by Franco et al. (2020), which highlights the role of behavioral reinforcement in increasing classroom engagement, fostering responsibility, and promoting a sense of achievement. Further support comes from a study by Bonghawan and Macalisang (2024), which demonstrated that reinforcement-based strategies led to significant gains in academic performance across multiple subject areas. Their findings also emphasized that the

effectiveness of reinforcement strategies is not exclusive to high-performing students. When appropriately tailored, reinforcement can benefit learners with varying academic backgrounds, learning preferences, and motivational levels. In the context of Social Studies, a subject often regarded as abstract or monotonous due to its heavy reliance on memorization, reinforcement-based teaching offers an alternative pedagogical approach. The integration of reward systems and student-centered interactions contributed to a more engaging learning atmosphere. As noted by Dou et al. (2024), when students experience a classroom climate that acknowledges and rewards effort, they are more likely to internalize the value of the learning process itself.

This study also highlighted several behavioral changes in the experimental group that can be attributed to reinforcement. Increased classroom participation, improved self-confidence, and a willingness to contribute to group discussions were among the observed changes. These indicators suggest that operant conditioning may contribute to developing not only academic competencies but also social and emotional skills necessary for holistic student development. However, the success of reinforcement strategies is contingent upon several critical factors. First, the consistency of reinforcement delivery significantly influences its effectiveness. Inconsistent application may lead to confusion or diminish the perceived fairness of the system. Second, the type of reinforcement used must align with the students' values and preferences. Rewards that are perceived as trivial or irrelevant may fail to elicit the desired behavioral responses. Third, students must be aware of the rationale behind the reinforcement. When learners understand that rewards are contingent upon specific behaviors, the reinforcement process becomes more transparent and ethically grounded.

Wicaksono and Purnomo (2021) emphasize that reinforcement strategies should be context-sensitive and culturally appropriate. In educational settings, cultural norms play a significant role in shaping students' responses to rewards and punishments. Therefore, it is essential for educators to design reinforcement systems that resonate with the local educational culture while promoting universal values such as respect, effort, and responsibility. From a practical standpoint, this research offers important implications for instructional design and teacher training. Teachers need to be equipped not only with the theoretical knowledge of operant conditioning but also with the practical skills to apply reinforcement strategies effectively (Shafiyaturrohman et al., 2024). Professional development programs should include training on behavioral observation, reinforcement scheduling, and ethical considerations in applying rewards and punishments. Additionally, schools should foster a collaborative culture where teachers share best practices and collectively reflect on the impact of reinforcement in their classrooms.

Despite the positive outcomes, this study acknowledges certain limitations. The duration of the intervention was relatively short, which may not fully capture the long-term effects of reinforcement-based instruction. Future studies should consider longitudinal designs to examine whether behavioral and academic improvements are sustained over time. Additionally, the study focused solely on eighth-grade students in Social Studies, limiting the generalizability of the findings. Subsequent research could expand to other subjects and educational levels to explore the broader applicability of operant conditioning in diverse learning contexts.

In conclusion, this study supports the notion that reinforcement-based learning, grounded in the principles of operant conditioning, can serve as an effective instructional strategy in improving student learning outcomes. The integration of positive and negative reinforcement not only enhanced students' academic performance but also promoted desirable classroom behaviors and affective engagement. As such, operant conditioning remains a valuable tool in modern educational practice, especially when implemented with consistency, contextual awareness, and ethical sensitivity. Through thoughtful

application, reinforcement can help educators create learning environments that are not only cognitively enriching but also emotionally supportive and behaviorally constructive.

CONCLUSION

This study concludes that a learning model based on the principles of operant conditioning is effective in enhancing students' academic achievement in Social Studies. The experimental group, which received both positive and negative reinforcement, demonstrated better learning outcomes compared to the control group. The application of reinforcement principles encouraged active participation, fostered positive learning behaviors, and enhanced both cognitive and affective student engagement. However, the effectiveness of this model largely depends on the teacher's consistency, the appropriate selection of reinforcement types, and students' understanding of the learning objectives. Despite several challenges in its implementation, the findings of this study emphasize the importance of innovative instructional strategies in making Social Studies learning more engaging, meaningful, and positively impactful on students' academic and behavioral development.

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