

From educational norm theory to experimental design: the impact mechanism of normative conformity on learning strategy selection

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Abstract. The normative issues have traditionally been one of the primary subjects of the educational philosophy, and specifically, their impact on learning strategies and cognitive development. Norm conformity does not merely concern the compliance with the standards provided by the external factors, but also approaches the cognitive organization and choice of the strategy to a great extent. This is an experimental psychology research on the role of normative conformity in learning strategy selection and its role in cognitive developments using the techniques of experimental psychology. The study conducted with the help of experimental design investigated the efficiency of learning, strategy choice, and cognitive functioning under normative and non-normative situations in the participants. The findings show that the learning strategies of normative learners were more organized and they were much better performers in terms of both learning efficiency and cognitive tasks as compared to the control group. This paper shows that normative conformity can be effective in enhancing cognitive growth among learners and maximizing the learning strategies and offer new insights and empirical evidence towards normative issues in teaching practices.

Keywords: educational normative theory, experimental psychology, norm compliance, learning strategies, cognitive development

1. Introduction

Normative issues in educational philosophy have long been a central focus in academic discussions. Norm conformity not only concerns the constraints of social behavior but also plays a significant role in learning and cognitive processes [1]. Educational norm theory explores how norms exert influence and guide students' behavior and strategy choices in the educational context. In contemporary educational research, normative issues are being re-examined, especially in modern education, where adherence to norms is regarded as a key factor in promoting students' cognitive development and strategy selection. At the same time, experimental psychology provides effective tools to delve into students' learning strategy choices and cognitive mechanisms through experimental design [2]. By integrating educational norm theory with experimental psychology, this study aims to investigate how normative conformity influences learners' selection of learning strategies and

cognitive development. The study will use experimental designs to examine how learners adjust their strategy choices in different normative contexts and analyze the impact of these adjustments on cognitive development.

2. Literature review

2.1. Educational norm theory and learning behavior

Educational norm theory highlights the role of norms in the educational process, particularly how norms influence students' behavior and decision-making, thereby enhancing learning outcomes [3]. Existing studies show that norm conformity affects not only students' behavioral choices but also extends to the level of learning strategies, directly influencing how students process information and select learning approaches. Some research argues that external norms have a guiding effect on learning strategy selection, especially in complex learning situations where students often rely on social norms and cultural expectations to guide their learning behavior [4].

2.2. Experimental psychology and learning strategy selection

Experimental psychology offers substantial empirical support for understanding how learners select learning strategies. Through experimental designs, researchers are able to reveal how individuals adjust their learning strategies under varying cognitive loads and in different contexts [5]. Numerous experimental studies show that the selection of learning strategies is closely related to students' cognitive development, with situational factors such as time pressure, task difficulty, and external norms significantly influencing strategy choices [6]. When selecting strategies, learners do not solely rely on intrinsic cognitive abilities but rather choose the best strategy based on external information and social norms, fitting the current situation.

2.3. Normative conformity and cognitive development

The relationship between normative conformity and cognitive development is a key issue in educational psychology. Numerous studies have pointed out that adhering to external norms helps individuals form more stable cognitive structures during cognitive development. In the learning process, learners not only face internal cognitive challenges but also adjust their cognitive patterns under the guidance of external norms [7]. Norm conformity influences learners' strategy selection, indirectly promoting the development of their cognitive abilities. For example, adhering to academic norms helps students better organize their knowledge frameworks, enhance their concept formation abilities, and improve problem-solving skills [8]. Studies also suggest that normative conformity is particularly important in the early stages of cognitive development, as learners' cognitive structures have not yet stabilized, and external norms can help them form an ordered cognitive system in a chaotic information environment.

3. Experimental methods

3.1. Experimental design

The experimental design aims to examine the impact of normative conformity on learning strategy selection and cognitive development. There are two groups in the experiment: the normative conformity group and the control group, with a total of 120 university students, 60 in each group. In the normative conformity group, participants follow predefined norms during the learning tasks, while the control group is not bound by any norms and selects learning strategies freely. The experiment consists of two phases: the first phase involves a

knowledge acquisition task, where participants complete a reading comprehension task, and the second phase is a cognitive test to measure their learning outcomes. This design allows for a direct examination of how normative conformity influences learning strategy selection, controlling for other variables. The difficulty and cognitive load of the tasks are carefully calculated to ensure fairness and comparability. Data collection includes behavioral observation, learning performance evaluation, and reaction time measurement.

3.2. Data collection and analysis

During data collection, Reaction Time (RT) and learning strategy selection data are quantified. In high cognitive load tasks, participants' strategy choices (e.g., structured versus unstructured learning) and reaction time are compared [9].

Reaction Time (RT) formula as shown in Equation (1):

$$RT = \frac{\sum_{i=1}^n t_i}{n} \quad (1)$$

Where t_i is the reaction time for each task stage, and n is the total number of tasks. This formula calculates the average reaction time, reflecting the efficiency of learning strategy selection.

Learning Efficiency (LE) formula as shown in Equation (2):

$$LE = \frac{S}{T} \quad (2)$$

Where S is the learning score and T is the time taken to complete the task. Learning efficiency is used to assess the differences in efficiency between the normative conformity group and the control group. Data will be analyzed using SPSS, with an ANOVA test to examine the significant impact of normative conformity on learning strategy selection.

3.3. Experimental variables and controls

The independent variable in this experiment is the "normative conformity context", which has two levels: normative conformity and no normative context. The dependent variables include learning strategy selection, cognitive load, and learning outcomes (learning scores) [10]. To ensure control, participants' prior cognitive abilities (e.g., reading comprehension skills) are measured and treated as covariates [11]. Additionally, potential external variables, such as environmental factors, are controlled to ensure the internal validity of the experiment. All experimental materials (e.g., learning tasks, test items) are pre-tested to ensure appropriate difficulty and their ability to reflect students' learning outcomes. In the data analysis phase, covariance analysis (ANCOVA) will be used to control for covariates and further analyze the effect of normative conformity on learning strategy selection and cognitive development.

4. Results

4.1. Impact of normative conformity on learning strategy selection

The experimental outcomes indicate that normative conformity group scored far-better than the control group in terms of strategy selection in learning. Namely, participants of the normative conformity eventuality group were more likely to select more structured ways to study, namely, concept mapping and time management techniques, whereas the control group was more diverse in their selection of strategies. Regarding the Reaction Time (RT), the normative conformity group recorded a mean reaction time, which was 12.5 seconds as compared to 15.3 seconds with the control group and the difference was statistically significant ($p < 0.01$). Besides, the normative conformity group demonstrated greater Learning Efficiency (LE) having the mean of

0.85 than that of the control group who had 0.70. The trend depicted in the following figure compares the learning efficiency and the choice of strategy to learn between the normative conformity group and the control group.

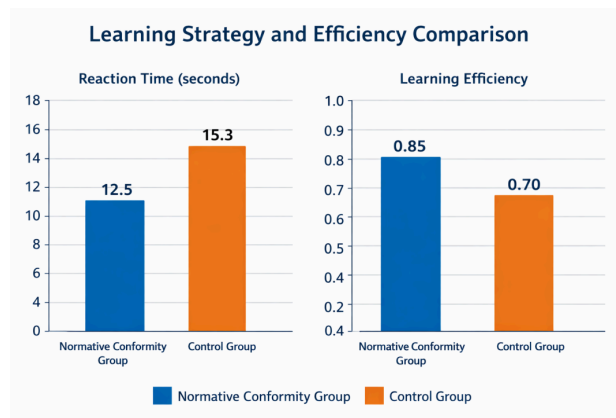


Figure 1. Learning strategy and efficiency comparison

As shown in the figure 1, the normative conformity group outperformed the control group across all tasks, especially in tasks with high cognitive load, where they exhibited higher learning efficiency and lower reaction times. This suggests that normative conformity significantly enhances learners' ability to select appropriate learning strategies in complex tasks.

4.2. Relationship between normative conformity and cognitive development

Further analysis of the experimental data shows that normative conformity not only affects learning strategy selection but also significantly promotes cognitive development. In tasks with higher cognitive load, the normative conformity group performed better than the control group in terms of problem-solving ability and concept formation. Specifically, the normative conformity group scored an average of 85.7 points, significantly higher than the control group's score of 72.3 points ($p < 0.05$). The Table 1 presents the score differences between the groups in cognitive tasks:

Table 1. Score in cognitive tasks

Group	Learning Score (S)	Learning Efficiency (LE)
Normative Conformity	85.7	0.85
Control Group	72.3	0.70

As shown in the table 1, the normative conformity group outperformed the control group in both learning scores and learning efficiency, particularly in tasks with high cognitive load, where the score gap was more pronounced. This suggests that normative conformity indirectly promotes cognitive development by improving the selection of learning strategies, enhancing learners' ability to cope with challenging tasks.

5. Discussion

This study results reveal that normative conformity is very important in the learning process. Students who are norm adherents were in a better position to be able to arrange learning tasks, choose the right learning strategies and in this regard enhance the efficiency of learning and cognitive development especially in tasks

with high cognitive load. The reason behind this finding is consistent with the current educational norm theory proving that external norms do not merely influence learning behavior, but also contribute positively to the choice of learning strategies and development of cognitive structures. Nonetheless, this study has shortcomings. First, the sample size comprises of only university students, and future studies, would incorporate an additional participant of various ages, cultures and learning environments in order to ascertain the ubiquitous effects that normative conformity has on learning. Also, the nature of learning tasks in this study were quite basic and future research would be able to include how various types of tasks can differ in relation to normative conformity, which will further promote the relevance of the study.

6. Conclusion

This paper examined how normative conformity affects learning strategy choice and cognitive growth under the context of the educational norm theory. Normative conformity, according to the experimental results, is successful in facilitating the choice of strategies and cognitive performance of learners, particularly when it comes to high cognitive load activities, the efficiency and cognitive growth of the learners was significantly improved. This research offers new empirical data to the normative problems of educational practice and gives new insights into an innovative direction of further research. The findings, although with some drawbacks, can be used to further justify the educational norm theory and point into the aspect of normative conformity as a future potential in improving learning and cognitive growth. This mechanism can be confirmed in more generalized situations in future researches, which would offer a more systematic theory and empirical evidence that norms can be applied to an educational practice.

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