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CURRICULUM & TEACHING STUDIES | RESEARCH ARTICLE

Evaluation of Turkish and mathematics curricula according to value-based evaluation model[†]

Serap Nur Duman^{1*} and Oktay Akbaş¹

Abstract: This study evaluated secondary school seventh-grade Turkish and mathematics programs using the Context-Input-Process-Product Evaluation Model based on student, teacher, and inspector views. The convergent parallel mixed method design was used in the study. Student values were identified using the scales for socio-level identification, traditional values, democratic values, work-business values, scientific values, and basic values. Teacher values, on the other hand, were identified using the Schwartz Values Scale. As a result of the analysis, regarding gender, there were significant differences in helpfulness, consistency, reliability, working hard, investigation, and esthetic value dimensions in favor of the female students. The helpfulness value is the most important one for both Turkish and mathematics teachers.

Subjects: Education; Educational Research; Curriculum Studies

Keywords: value; value-based program evaluation; Turkish curriculum; mathematics curriculum

1. Introduction

Humanistic approaches in evaluation present educators with several options such as alternative evaluation models, multidimensional assessment of instructional contexts, and the inclusion of students, teachers, and the society in evaluation as opposed to limiting it to program evaluation experts. As a result, various evaluation alternatives such as participant- or consumer-based models have emerged, and program development has come to include not only numerical data but also student interests, motivation, talent, and expectations. Following this trend, Stufflebeam pioneered the development of new approaches and models in program evaluation.



Serap Nur Duman

ABOUT THE AUTHOR

Serap Nur Duman completed her master's degree in Curriculum and Instruction and she earned her PhD in Curriculum and Instruction. She started her career as a research assistant in Kırıkkale University; she has been working in Kırıkkale University. Research areas of interest include: curriculum and instruction, program evaluation, and research methods.

PUBLIC INTEREST STATEMENT

Values are important in everyday life. Even though rules and laws organize our actions, we still need to learn about values. Because we have internalized values and behave according to them. So we wanted to evaluate the values. This study aims to evaluate the context and process dimensions of seventh-grade Turkish and mathematics programs using the value-based program evaluation model. Program evaluation requires data collection and researching the program's objectives, content, learning situations, and assessment situations to make a decision about education program. Thus, in program evaluation, important findings of needs of participants, expectations, and opinions about program should be considered. According to the teachers, the most important values are helpfulness, responsibility, confidence, and using Turkish accurately. Cleanliness, helpfulness, national security, and confidence are important for students.

1.1. Stufflebeam's CIPP evaluation model

Evaluation, a critical stage in curriculum development, is defined by Stufflebeam and Shinkfield (2007) as the systematic process of consulting, reporting, obtaining, and revealing valid and judgmental data about the usefulness, value, accuracy, validity, confidence, significance, and/or impartiality of goals. Basing the Context-Input-Process-Product Evaluation Model (CIPP) model on three key definitions, we refer to evaluation as the act of revealing the value of certain objects and phenomena with systematic research. Functionally, evaluation is the process of describing, obtaining, recording, and implementing descriptive and judgmental information in order to decide on the value, usefulness, importance, and accuracy of certain objects, support transparency, disseminate effective practices, and clarify complex phenomena. The model, in its extensive nature, reflects various types of change, decisions, decision-making environments, and evaluation. The type of evaluation that emerges from this model is defined as "The process of delineating, obtaining and providing information for judging decision alternatives" (Oliva, 2008). The model views evaluation as an ongoing process and brings forth four types of evaluation, which also name the model: Context, input, process, and product evaluation (Ornstein & Hunkins, 1988).

Stufflebeam (1969) explains context evaluation with an example: for instance, the context may be a small elementary school pushed toward the periphery in a metropolitan area. The true reading achievement of children in this school may be below the level that the school expects. Context evaluation then reveals the need for an increase in children's reading success. In the next step, the school attempts to define the reasons for this emerging need. Possible problems may be explored by asking questions, such as: Are children receiving sufficient education? Are educational materials appropriate for these children? Is there a significant language problem in the area? Is there a high rate of absence in this school? Are the school's expectations from the children realistic? In this way, possible problems that stand before actualizing the goals and meeting the needs they create may be understood.

In the input evaluation stage, Stufflebeam, Madaus, and Kellaghan (2000) mention the attainment of program goals, cost-effectiveness and feasibility, evaluation of activity, personnel plans, and approaches required to meet the needs (Yüksel & Sağlam, 2012). Process evaluation, on the other hand, is designed to provide information throughout program implementation and supports program managers in ensuring that the program is developed in accordance with regulations, run as planned and equipped with structural decisions (Stufflebeam, 1969). In the product evaluation stage, information is collected at the end of the program regarding the output or products, and the obtained products are compared against expectations. Based on the results of this comparison, evaluators may decide that the program should continue, become reorganized, or terminated (Erden, 1995).

Values can be best described as true behavior standards, which can be seen as abstract concepts or beliefs concerning a person's goals and serve as guiding standards in his or her life. If we know the values of a person, we can comment on their behavior. So values are important for the evaluation process. Value, the root term of evaluation as Stufflebeam and Shinkfield (2007) have expressed, forms the center of the CIPP Evaluation Model different from other evaluation models that guides and makes sense of the evaluation process. With this in mind, the notion of value stated in the model means any opinion adopted by a person, group, or society. These values include all social subjects, such as educational values supporting talents and interests of students, helping all students improve their academic skills, as well as paying attention to the families of students regarding their children's healthy development, and protecting human rights (Stufflebeam & Shinkfield, 2007). In fact, when evaluators intend to evaluate the work of a program or institution, they must consider the related social, institutional, and program-related values or vocational and technical values. Taking these values into consideration helps the evaluators form new evaluation criteria or check the appropriateness of the existing evaluation criteria while evaluating. While assigning some importance to learning the core values of a program or project we want to assess, the characteristics of the participants in the program or the environment in which the program is

intended to be applied, at the same time, indicate that this job is not easy; that different program participants, different cultures have various values that come forward (Stufflebeam et al., 2000, p. 305). The model comprises values: four evaluation focuses related to values expressed as the target, plan, outcome, and output, action, and effectiveness, and lastly, four forms of evaluation that this evaluation focuses serve. According to Stufflebeam and Shinkfield (2007), the concept of value stands for any thought adopted by an individual, group, or society.

1.2. Purpose of the study

This study aims to evaluate the context and process dimensions of seventh-grade Turkish and mathematics programs using the value-based program evaluation model. Taking students, teachers, and inspectors as its participants, the study focuses on their values, as well as the values present in instructional environments so that the context and process dimensions of the program may be evaluated using the CIPP.

2. Methodology

This research is designed in a mixed method approach. The mixed method approach is a research design where the researcher collects and analyses data, including findings, in a single study or a research program making inferences using qualitative and quantitative approaches or methods (Creswell & Plano Clark, 2014). It was deemed appropriate to use the mixed method in this study because it was the subject of this research to reveal the value perceptions of different participants and to understand the effects of these values on the program evaluation process.

In convergent parallel design of mixed methods, data collecting includes gathering both quantitative and qualitative data simultaneously, analyzing the information separately, combining these databases, and giving equal weight to the two information types; in this process, changes can be made in giving priority to qualitative or quantitative data (Büyükoztürk, Çakmak, Akgün, Karadeniz, & Demirel, 2012; Creswell & Plano Clark, 2014). In the quantitative dimension of the research, descriptive research method was used. Descriptive research is the most preferred method in the field of education because it summarizes the characteristics of individuals, groups, or physical environments (Büyükoztürk et al., 2012). In the qualitative dimension of the study, a case study was carried out. McMillian defines case study as a method in which one or more events, the environment, the program, the social group, or other interrelated systems are examined in depth (as cited in Büyükoztürk et al., 2012).

2.1. Study group

Mixed method was preferred in the research; the research applications were carried out in parallel for the quantitative and qualitative dimensions.

2.1.1. Students

The quantitative method applications of the study were carried out with seventh-grade students in six middle schools located in central Kırıkkale city center. These schools were chosen by the purposive sampling technique. In maximum variation sampling, it is aimed to determine the different situations related to the investigated problem in the population that is similar to itself and base the research on them (Büyükoztürk et al., 2012). A total of 345 seventh-grade students from six different schools participated in the research from the lower, middle, and upper socioeconomic levels and from the scales that were filled, 45 were eliminated because they were not suitable to evaluate and with 300 scales the research was completed. Scales which scale items were not fully replied, with multiple options marked or with inconsistent markings and were not evaluated and excluded from the research as a result of data extraction. Of these students, 35 attend to upper socioeconomic level, 186 attend to middle socioeconomic level, and 79 attend to low socioeconomic level. Of the seventh-grade students who participated in the study, 56% were female students and 44% were male students.

2.1.2. Teachers

All teachers in seventh-grade Turkish and mathematics courses in Kırıkkale province center form the study group of the research. This practice was carried out on the basis of volunteerism with the teachers of Turkish and mathematics entering the classes in the seventh grade of middle school, in accordance with the purpose of the research. By simple random sampling, a seventh-grade Turkish teacher and a seventh-grade mathematics teacher have been interviewed from each school. In one of the schools, the Turkish teacher did not accept to participate in the study, and there were no other seventh-grade Turkish teachers at the school. Thus, in the context of study, 11 teachers were interviewed in total. Six of the teachers participating in the interview are mathematics and five are Turkish teachers. Of these teachers, seven are graduated from education faculty, and four graduated from the faculty of science and literature. Teachers have at least 1 year and at most 20 years of professional experience.

2.1.3. Inspectors

Inspector opinions were also applied in the investigation. In these interviews, all of the inspectors working in Turkish and mathematics branch are reached. Thus, no sample selection technique was used. The whole population was included in the study. Two Turkish course inspectors and two mathematics course inspectors were interviewed with a total of four inspectors. Two of the inspectors who participated in the interview were graduates of education faculty, one with master's degree from education faculty and the other graduated from the faculty of theology faculty. Inspectors have at least 5 years and at most 14 years of professional experience.

2.1.4. Lesson observations

The values carried by the Turkish and mathematics courses were observed by participating in seventh-grade Turkish and mathematics courses in six schools selected according to the socioeconomic levels in Kırıkkale. The observations in the survey were completed with 12 h of lesson observations by taking two hours of seventh-grade Turkish lessons and two hours of seventh-grade mathematics lessons in each of the six schools selected according to their socioeconomic status (SES).

2.2. Data collection tools

2.2.1. Socioeconomic status determination scale and student values scale

SES determination scale and student values scale designed by Akbaş (2004) for the secondary school students were used. The socioeconomic-level scale was scored on each item to obtain a total score. The lowest and highest SES, which could be obtained from the measurement items, were calculated and the difference between these two scores was divided into three in order to determine the score range between the three socioeconomic levels. Since SES are evaluated at three levels in general, three SES have been determined at this scale as lower, middle, and upper levels. Student value scale is presented in five sections: traditional values scale, work-business values scale, democratic values scale, scientific values scale, and basic values scale.

2.2.2. Schwartz value scale

The Schwartz value scale, which was developed for teachers by Schwartz, was used as a quantitative data collection tool (Kuşdil & Kağıtçıbaşı, 2000). After reading the explanations made for the research in the Schwartz Values Scale consisting of 57 items, the seventh-grade Turkish and mathematics teachers who participated in the research scored the scale items according to the choices made from 1 to 7. In this scale, they scored from 1 to 7, with 1 = least significant and 7 = highest.

2.2.3. Semi-structured interview forms

Semi-structured interview forms are prepared in three sections. The first part included personal information including the name, surname, age, and gender of the participants; the second part contained the educational status and professional knowledge of the teachers and their experience. The third part of the research was composed of interview questions and this section was prepared as separate questions according to the teachers and inspectors.

2.2.4. Lesson observation forms

Lesson observation forms are prepared in two sections as the values carried by the physical environment and the learning-teaching process. In the first part, there are six expressions given such as classroom layout, cleaning, teaching material, usability (ergonomics, ease of tables), security, and esthetics. The part of the learning-teaching process that forms the second part of the course observation forms is prepared in two titles as: general education values and Turkish education values in Turkish lesson observation forms, and general education values and mathematics education values in mathematics lesson observation forms (Dede, 2006).

2.3. Data analysis

The data obtained from the scale were analyzed using the SPSS 18 package. The quantitative data from teachers were subjected to descriptive statistics, t-test for independent samples, one-way analysis of variance for independent samples, and regression analyses. A p level of 0.05 was considered significant. Similarly, quantitative data from the students were also analyzed and subjected to t-test for independent samples and one-way analysis of variance at a minimum significance level of 0.05. The lessons to be observed were selected via random sampling. A Turkish and a mathematics class were chosen randomly from each school for observation. Data from observed lessons were analyzed using frequencies and percentages.

The qualitative data obtained in the interviews were computed using the NVIVO 10 package and the accuracy of the transcribed interview records was confirmed by individual participants. These qualitative software programs can store text documents for analysis and help researchers in coding and naming sections of these texts. In this way, codes may be drawn, organized into charts showing interrelationships, and parts of texts with multiple codes may be easily reached (Creswell & Plano Clark, 2014). In this study, too, the researcher completed the coding using the data and moved into the next stage, which involved creating themes from similar codes. As the themes were built, the codes were grouped based on similarities and differences (Yıldırım & Şimşek, 2008).

3. Results

3.1. The distribution of student values according to socioeconomic background

The scores in items concerning students and traditional values showed that the sub-dimensions of thriftiness vary significantly among different socioeconomic backgrounds ($F_{(2-298)} = 4.88, p < 0.01$). For the sub-dimensions that were significant, *post hoc*-Tukey analysis results were examined. Thriftiness mean scores were higher among students from a lower socioeconomic background than middle-class students. Reliability mean scores, on the other hand, were higher among students from an upper socioeconomic background than those from a lower and middle socioeconomic backgrounds ($F_{(2-298)} = 6.22, p < 0.01$). For the sub-dimensions that were significant, *post hoc*-Tukey analysis results were examined. While thriftiness was more important for lower socioeconomic background, reliability was important for the upper socioeconomic background (Table 1).

Table 1. The results of one-way ANOVA about the traditional value according to SES

Traditional values		Sum of squares	df	Mean square	F	p	Significant difference
Thriftiness	Between groups	4.58	2	2.29	4.88	0.01	Lower SES-middle SES
	Within groups	139.53	298	0.47			
	Total	144.11	300				
Reliability	Between groups	3.22	2	1.61	6.22	0.00	Lower SES-upper SES Middle SES-upper SES
	Within groups	76.84	298	0.26			
	Total	80.06	300				

3.2. The distribution of student values according to gender

No significant difference was found between the scores obtained from male and female students from democratic values scales. Significant difference was found between the scores obtained from male and female students from traditional, work–business, scientific, and basic values scales. On the other hand, a gender-based significant difference was found between the scores obtained by students in the following dimensions of the traditional values scale: helpfulness ($t_{(298)} = 2.80, p < 0.01$), thriftiness ($t_{(298)} = 2.17, p < 0.05$) and reliability ($t_{(298)} = 3.32, p < 0.01$). The descriptive statistics are presented in Table 2. Helpfulness, thriftiness, and reliability were more important for female students. While p -values for helpfulness, thriftiness, were at 0.05, the p -value for reliability was at 0.000 level.

A significant difference was found in favor of female students in the working hard value when male and female student scores in work–business values were compared ($t_{(298)} = 3.38, p < 0.01$). The means show that working hard is more significant for female students.

Student scores in the scientific values scale revealed a significant difference between males and females in the dimensions of investigation ($t_{(298)} = 3.04, p < 0.01$) and creativity ($t_{(298)} = -3.68, p < 0.01$). Results showed that investigation is important for female students, while creativity is more important for males. Both values are found to be 0.000-level significant.

A significant difference was also found between male and female students' basic values scores in the dimensions of esthetics ($t_{(298)} = 2.12, p < 0.05$) and cleanliness ($t_{(298)} = 2.52, p < 0.05$). The means of the female students were significantly higher than males (Table 3).

3.3. The distribution of teacher values according to subject matter

In this section, the data obtained with Schwartz values scale are interpreted. The values scores of seventh-grade Turkish and mathematics teachers who participated in the study did not differ significantly, and their value preferences had similar mean scores. It was, therefore, concluded that teacher values do not differ based on teaching either Turkish or mathematics. The highest teacher value preference mean score was obtained in the helpfulness sub-dimension, showing that this value is the most important one for both Turkish and mathematics teachers. Therefore, the relations of the dimensions in the scale were analyzed and the dimensions were found to predict the value of helpfulness the most. Traditionalism, compliance, confidence, and self-control values were found to be particularly meaningful predictors of the value of helpfulness ($R = 0.88, p < 0.01$). These variables explained 78% of the variance in the helpfulness sub-dimension.

Table 2. Descriptive statistics about traditional values and work–business values

	Values	Gender	N	Mean	SD
Traditional values	Helpfulness	Female	168	4.53	0.55
		Male	132	4.33	0.73
		Total	300		
	Saving	Female	168	4.35	0.58
		Male	132	4.17	0.81
		Total	300		
	Reliability	Female	168	4.54	0.46
		Male	132	4.34	0.56
		Total	300		
Work-business values	Working hard	Female	168	4.42	0.57
		Male	132	4.20	0.57
		Total	300		

Table 3. Descriptive statistics about scientific values and basic values

	Values	Gender	N	Mean	SD
Scientific values	Investigation	Female	168	4.34	0.44
		Male	132	4.18	0.48
		Total	300		
	Creativity	Female	168	3.62	0.98
		Male	132	4.02	0.87
		Total	300		
Basic values	Esthetics	Female	168	4.19	0.72
		Male	132	4.00	0.80
		Total			
	Cleanliness	Female	168	4.77	0.42
		Male	132	4.63	0.53
		Total	300		

3.4. The views of Turkish teachers about context and process evaluation

According to the teachers in the Turkish curriculum, the most important values are responsibility, confidence, and using Turkish accurately. They attach importance to values such as tolerance, responsibility, love, honesty, discipline, universal values, traditional and cultural values, working hard, and respect. According to their views, Turkish classes can equip students with the values of creativity, entrepreneurial ship, self-confidence, national and personal values, reading, accurate and effective speech, in addition to the values favored by Turkish teachers, such as responsibility, respect, and Turkish course values. Regarding the effects of contextual factors on the instructional process, teachers stated that the context is affected positively by linking target values to real life and by organizing out-of-school social activities, while habits such as TV and media addiction, watching inappropriate programs, being exposed to bad examples, and bad language use affect the instructional process negatively.

As Turkish teachers discussed important values in the instructional process, they stated that the Turkish program emphasizes personal and Turkish course values. They added that throughout the process, they teach target values by empathizing with them, supporting criticism and questioning in students, and employing activities, such as drama and writing. Turkish teachers also claimed that the time allocated to the Turkish program is not sufficient, speaking activities should be increased, and their level should be differentiated based on students, class environment, materials, and difficulty. Teachers mentioned many positive effects of including values in the course process and ensuring students acquire them. They particularly stated the importance of values in the acquisition of self-confidence, honesty, respect, imagination, and national values, as well as in the development of accurate and proper writing and communication skills.

3.5. The views of mathematics teachers about context and process evaluation

Mathematics teachers stated in the interviews that the values emphasized in the mathematics curriculum are, on the whole, course-related mathematical values and that others are either not included in the program or only treated superficially or insufficiently. The values emphasized by mathematics teachers seem to be personal, moral, and traditional ones, while love and respect also seem to be favored. They stated in the interviews that the mathematics program equips students with the values of problem-solving, analytical thinking, generating solutions, living in harmony with the environment, logical thinking, investigativeness, curiosity, establishing relationships, helpfulness, decision-making, interpreting, questioning, communication, tidiness, cooperation, patience, and scientific thinking. They believe that families, extra tutorials, the media, and the Internet affect contextual values. They added that knowing responsibilities, being good and ethical, and making an effort were emphasized in the instructional process of the mathematics program. Findings from

teachers also showed that while the program is rich in activities tapping into course-related values, it does not include many activities tapping into other general values such as respect, love, tolerance, national, and cultural values. Stating the importance of emphasizing values in the mathematics class, teachers argued that doing so increases student interest in and motivation for mathematics, affects student success positively, and facilitates classroom practices.

3.6. The views of Turkish inspectors about context and process evaluation

Interviews with Turkish course inspectors showed that they find values based on laws and regulations more important than others. They therefore emphasize the following values in the context: law numbered 1739, raising healthy and balanced individuals following the principles and revolutions of Atatürk, national values, scientific thinking and universality, responsibility and creativity, and cultivating a rich imagination. After first emphasizing law- and regulation-related values, inspectors added that each course has its own intrinsic values, which makes the Turkish program unique. They stated that the Turkish program equips students with national, spiritual, moral, and universal values, as well as tolerance, love, accurate use of Turkish, and love for the nature and animals. Inspector views about the implementation of context-related values revealed that the biggest problems are the mismatch between the values emphasized in laws and regulations and those emphasized in actual classes, and the failure of teachers to grasp the philosophy and goals of the program and the general values included in it.

Regarding the effects of contextual factors, inspectors stated that the media and TV generally have negative effects on students, and that families should guide their children and act responsibly, offer them positive examples and tools for value acquisition. About value-course relations in grade seven, Turkish course inspectors stated that Turkish teachers are not fully familiar with the program philosophy and content, and that the Turkish program should be revised for simplification and flexibility. Regarding values in the instructional process, inspectors stressed the importance of teacher perspectives on values and stated that neither Turkish course values nor general values are evaluated successfully.

3.7. The views of mathematics inspectors about context and process evaluation

Mathematics inspectors mentioned their views about the general values in Turkish national education. Among the basic values in the mathematics curriculum, they listed comparing, making quick decisions, thinking fast, finding solutions, making analyses, questioning, self-confidence, and practical thinking. In the interviews, inspectors said that the mathematics course equips students with the values of problem-solving, practical thinking, and self-confidence. They also stated that the basic values of national education mentioned in laws and regulations do not reflect the values emphasized during the implementation of the program. Regarding the effects of environmental factors such as families, the environment, and media, inspectors mentioned violence in the family or the environment, lack of reinforcement in the family, lack of cooperation with teachers and the school, and learning literacy skills and mathematics prior to starting elementary school.

In interviews with mathematics inspectors regarding the process, it was concluded that the mathematics program only emphasized mathematical values. Regarding the instructional process, mathematics inspectors stated that teachers should first believe in the importance of values and their necessity in the instructional process. They mentioned the deficiencies in the implementation of both mathematical and general values during the instructional process, and added that the process is not successful in its present condition.

3.8. Basic values in the learning environments and instructional processes of Turkish and mathematics courses

Based on the findings from Turkish lesson observations, cleanliness ($M = 3.86$) received the highest mean score among physical values in the instructional process, while reliability ($M = 2.71$) received the lowest. Throughout the process of the Turkish course, responsibility ($M = 4.71$) received the

highest mean score among general education values, while self-control ($M = 3.43$) received the lowest. Regarding Turkish education values, cooperation and imagination ($M = 4.43$) received the highest mean score, while creative thinking ($M = 2.86$) received the lowest.

In the mathematics course, classroom order and cleanliness ($M = 4.00$) received the highest mean score among the physical values in the instructional process, while esthetics ($M = 2.29$) received the lowest. Throughout the instructional process, respect, sincerity, and tolerance ($M = 4.71$) received the highest mean score among general education values, while self-control ($M = 3.00$) received the lowest. Regarding mathematics education values, inferencing and analytic thinking ($M = 4.71$) received the highest mean score, while being organized ($M = 2.86$) received the lowest.

4. Conclusion

This aspect, while performing program evaluation which has become an important part of the process program development, needs, interests, and values of students, teachers, and inspectors located in education program, needs to be taken into consideration. To do so, this study evaluated student values based on socioeconomic background and gender. Thriftiness mean scores were higher among students from a lower socioeconomic background than middle-class students. Reliability mean scores, on the other hand, were higher among students from an upper socioeconomic background than those from lower and middle socioeconomic backgrounds. As a result of the analysis, in terms of gender, there were significant differences in helpfulness, consistency, reliability, working hard, investigation, and esthetic value dimensions in favor of the female students. Means of creativity were significant more for males than females.

Teacher values were found not to vary based on the course they teach, and both Turkish and mathematics teachers were found to extol the value of helpfulness the most. According to the teachers in the Turkish curriculum, the most important values are responsibility, confidence, and using Turkish accurately. The values emphasized by mathematics teachers seem to be personal, moral, and traditional ones, while love and respect also seem to be favored. Turkish course inspectors showed that they find values based on laws and regulations more important than others. Mathematics inspectors said that the mathematics course equips students with the values of problem-solving, practical thinking, and self-confidence. It is believed that these findings from students, teachers, and inspectors and the values identified in lesson observation forms will contribute to future studies on curriculum evaluation.

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