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LEARNING STYLES IN PUPILS OF PRIMARY SCHOOL FINAL GRADES

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Abstract:
Learning styles are a concept that occupies an increasingly important space in pedagogical theory and practice with the aim of improving short-term and long-term teaching outcomes. Kocinski (1984) defines a learning style as the way a person learns most often or the way she/he learns best. In this paper, we have paid special attention to learning styles in pupils in the final grades of primary school, and to what extent the representation of learning styles in pupils depends on gender, age and school success that pupils achieve in learning. In the research, we have used modified diagrams of Kolb's model dividing learning styles into: activists, thinkers/reflectors, theorists, and pragmatists. The sample has consisted of 802 pupils in the final grades of primary school (seventh, eighth and ninth). We have started from the assumption that certain differences exist in the representation of learning styles depending on the gender, age and success of pupils. The obtained results have shown that the given hypothesis has been partially confirmed. Differences in learning styles among pupils depending on their gender have

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been found in those who use activist's style and thinker's/reflector's style. A significant difference in the representation of learning styles in pupils depending on age has not been registered, while the difference in the representation of learning styles in pupils regarding school success has been found in pupils preferring the style of theorist and pragmatist. The obtained research results will serve the purpose of improving the efficiency of the acquisition of acquired knowledge, and indicate which of the learning styles should be encouraged in pupils.

Keywords: learning styles, school achievement, pupil age (seventh, eighth and ninth grade), gender

1. Introduction

Theoretical and empirical research dealing with the problem of learning styles began in the early 20th century. From then until today, many researchers from different scientific fields have been studying learning styles. Different approaches to learning agree that learning is a process that leads to relatively lasting, acquired changes in an individual's functioning. Approaches to student learning include different learning styles. In pedagogical-didactic theory and practice, learning styles occupy an increasingly important place. Thus, success or failure in learning can be attributed to the use of the learning method responding mostly to the student and that accordingly gives the best results. These ways of learning can simply be called learning styles. Much has been written about learning styles, but there is still no single answer on how to learn. There are many definitions of learning style, which are based on different elements. Given all the differences in the ways of learning of individuals, it seems that there are as many different ways of learning as there are people who learn. Every man has a special, unique way of learning, the unique way he perceives the world around him. Although the learning style can be defined as the way an individual learns, more complex definitions appear in the literature, which depend on the theory of learning advocated by individual authors. The most complete and most cited definition of learning styles has been given by Keeffe (1987), and he says that learning styles are cognitive, affective and physiological personality traits that are a relatively permanent indicator of how students perceive and relate to the environment that serves as a source of knowledge. Learning styles are the basic characteristics of an individual to enter and understand new information.

Kocinski (1984) defines learning style as the way a person learns most often or the way he learns best (according to Tubić, 2004). According to this definition, the use of a certain learning style depends on being a certain type of person. Learning styles are general approaches used by students to learn new topics (Oxford, Ehrman, Lavine, 1991). Reiff argues that learning styles influence how students learn, how teachers teach, how they communicate (Reiff, 1992). Every person is born with certain inclinations towards certain learning styles, but those styles they prefer are influenced by culture, experience, development. Kolb (1984), according to the postulates of "Experiential Learning Theory" as well as Honey and Mumford, describes an individual's learning styles as desirable or

common ways of processing and transforming knowledge (Honey, Mumford, 1992). He states that "*experiential learning theory offers an approach to education and lifelong learning based on the intellectual tradition of social psychology, philosophy, and cognitive psychology*" (Kolb, 1984, p. 3). Kolb has based his learning cycle, which is the central principle of his theory of experiential learning, on Levin's work. He expresses his model through four phases of the learning cycle, in which *concrete experiences* (CE) provide a basis for *reflection and observation* (RO). These reflective observations are assimilated into *abstract concepts/abstract conceptualization* (AC), leading to new implications for action that can be *actively examined/active experimentation* (AE) creating new experiences (Kolb, 1984). The two important dimensions on which Kolb's learning process depends are the way information is accessed and the way information is transformed. Depending on the way in which the student dominates in learning, by combining the approach and transformation of information, four styles are distinguished: convergent (Converger), divergent (Diverger), assimilative (Assimilator), accommodating (Accommodator). To understand the mechanism of experiential learning, it is important to recognize what the role of experience is in the learning process. Any experiential learning is based on connecting practice with theory. Experience in the learning process can be specified in three points:

- learning can be simultaneous (when we are careful not to make a mistake while acquiring new knowledge),
- learning can be retroactive (when, after a work in progress, we think about what we have learned from it and how we can improve learning),
- learning can be proactive (how would we behave in a certain situation after summarizing other people's experiences in the same situation) (Beard, Wilson, 2006).

A modified diagram of Kolb's model of learning styles, based on his experimental learning theory (ELT) and learning styles inventory (LSI), according to Alen Chapman (2006), is given in Figure 3.

Kolb (2005a; 2005b) states that it is very important to emphasize that not all phases of the learning cycle are equally important to all students, nor is any phase of the learning cycle more important than the others. This suggests that preferring one phase of the cycle does not make students better or worse. Based on Kolb's learning cycle, Honey and Mumford built a typology of learning styles based on four styles, which we take as the basis for examining learning styles in students: activist, reflector/thinker, theorist, pragmatist (Honey and Mumford, 1992).

Activists in their work prefer work and experience, concrete experience is their basic source of knowledge, they rely on "knowledge of the known". They like to learn on the basis of experimentation and to actively participate in the learning process. They learn best from short interactive tasks.

Thinkers/reflectors learn best by observing and experiencing other people. They like to observe and reflect information in their minds before taking action. They make decisions when it suits them, they don't like anyone to rush them.

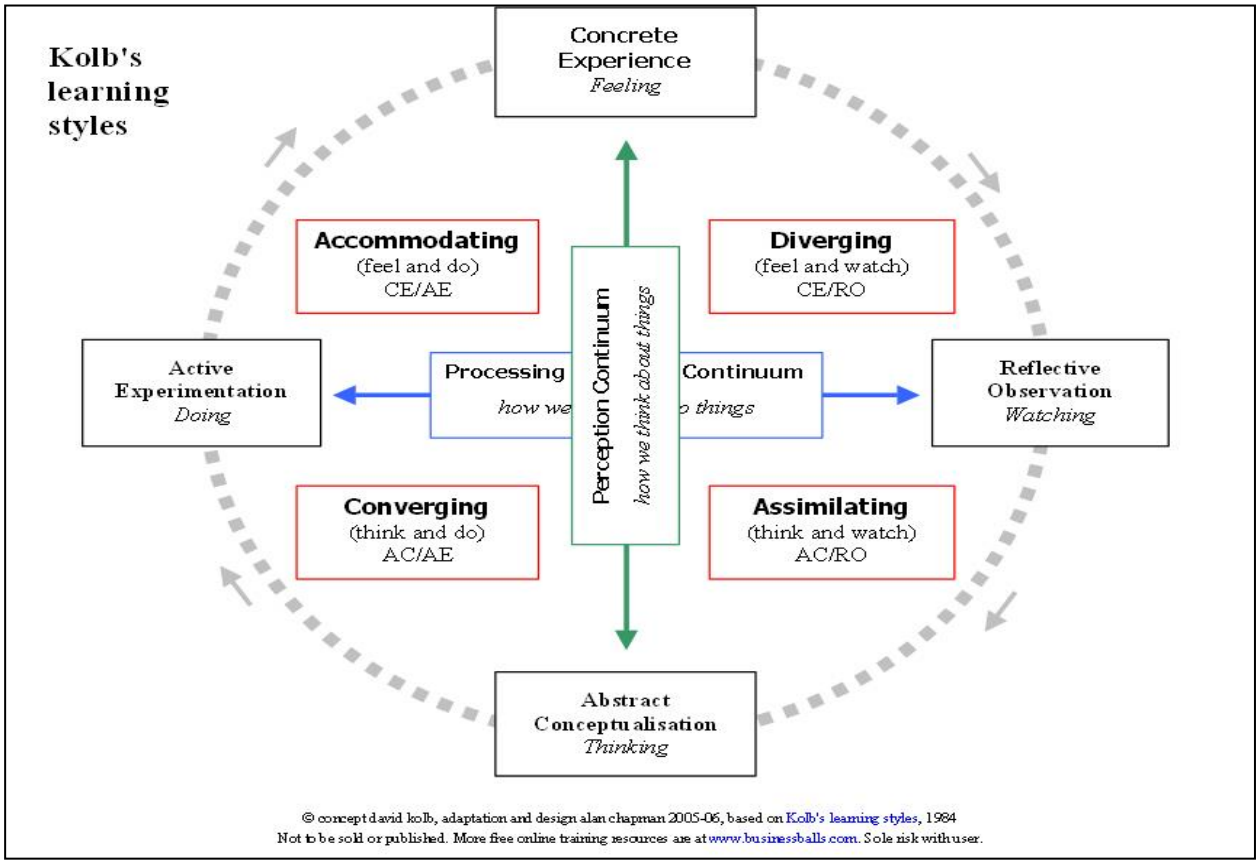


Figure 1: Model of learning styles

Theorists like to research methodically. They go step by step and ask questions. They are analytical and do not bond emotionally. They learn similarly to thinkers, but like to apply their own concepts and theoretical models.

Pragmatists like practical solutions, do not like to theorize and want to gain practical experience. They act fast and confidently. They learn similarly to activists, but like to have a practical goal for their activities.

2. Material and Methods

The research conducted among the students of the final grades of primary school from the Sarajevo - Romania region has aimed to examine whether there is a difference in the representation of learning styles among pupils depending on their social status characteristics. From the goal set in this way, the research tasks have been formulated as:

1) to examine the differences in learning styles in pupils depending on their gender;
2) to examine the differences in learning styles in pupils depending on their age;
3) to examine the differences in learning styles in pupils depending on their school learning success.

The research hypothesis: to examine whether certain differences exist in learning styles depending on the social-status characteristics of students.

2.1 Variables

In the research, we have used two groups of variables: independent social - status characteristics of students (gender, age and learning success) and dependent (learning styles).

2.2 Method

In this paper, we have used two methods, namely: the method of theoretical analysis and the method of empirical non-experimental research (survey method). We have used the method of theoretical analysis through the elaboration of the theoretical basis of the research and in the introduction and analysis of the content of previous research that are subject and methodologically related to this problem. It enables a theoretical understanding of the phenomena that are the subject of research, and adequate derivation of conclusions. In a word, no stage of any pedagogical research is possible without theory (Banđur & Potkonjak, 1999), so the method of theoretical analysis is represented in all stages of this research. We have used the survey method for a typical field research on a sample using instruments selected for the purposes of this research. It allows quick and easy collection of relevant data, as well as the use of various statistical procedures necessary to derive reliable results and conclusions.

2.3 Research techniques

The scaling technique, which is based on assessment scales, has been used to assess pupils' own learning-related behavior (pupils assess their learning styles). The survey technique is another technique used. Since it is a matter of collecting sociological data, data on gender and other characteristics, ie we needed identification data on students, we have opted for the survey technique in which data are collected on the basis of questionnaires.

2.4 Sample

The research was conducted in the area of Republic of Srpska, more precisely in the Sarajevo-Romanija region, in May 2016. It included pupils in the seventh, eighth and ninth grades of primary school. The total number of pupils was 802. Individuals were not selected in the sample, but groups, ie departments (characteristics of the group sample), and the choice of schools was not random, but adjusted to the possibilities (characteristics of the appropriate sample). The selection of the sample was single-phased, meaning that all members of the selected groups were taken as a sample. A detailed presentation of the sample structure is given in Table 1.

Table 1: The structure of the sample of respondents regarding their age

Age	**F**	**%**
7th grade	263	32,8
8th grade	290	36,2
9th grade	249	31,0
Total	802	100,0

By analyzing the structure of the sample according to the age of the respondents, it can be seen that it is uniform with respect to the age of the pupils. The number of respondents in the seventh, eighth and nineth grades was 32.8%, 36.2% 31.0%, respectively.

2.5 Instruments

For research purposes, we used two instruments. The instrument for examining learning styles taken over and adapted to our speaking area was from the authors (Honey & Mumford, 2000). The instrument had 80 items, it was composed of four subscales of 20 items each and measured four learning styles (activists, thinkers, theorists and pragmatists). Students were tasked with assessing whether or not they agreed with certain statements (1 = agree, 0 = disagree). The reliability of the instrument was checked by the method of analysis of items as a whole and by subscales. The level of the reliability coefficient of the instrument as a whole was 0.84. The results of Cronbach's Alpha coefficients by subscales are shown in Table 2.

Table 2: Reliability coefficients of instruments for measuring learning styles

Subscales Cronbach 's - alpha coefficients
Activists 0,62
Thinkers/Reflectors 0,64
Theorists 0,60
Pragmatists 0,60

Our reliability coefficients were slightly higher in relation to the coefficients obtained by the mentioned researchers from whom the instrument was taken. Their values were: activists = 0.60; thinkers/reflectors = 0.59; theorists = 0.60; pragmatists = 0.51.

In addition to the instrument for measuring learning styles, an instrument for examining the socio-status characteristics of students was constructed.

2.6 Data processing

Since this is a normal distribution and interval level of measurement for the independent and dependent variables, it is possible to use both the Kraskal Wallis test and the Men-Whitney test.

3. Results and Discussion

3.1 Differences in learning styles in pupils depending on their gender

The first task of the research was to examine whether there were differences in learning styles in pupils depending on their gender. The difference between the style of activists, thinkers/reflectors, theorists and pragmatists was examined. Difference testing was performed using the Men-Whitney test. Table 3 shows the results of testing the differences in the representation of learning styles among respondents of different genders.

From the Table 3, it could be seen that there was a difference in the representation of the style of activists and the representation of the style of thinkers/reflectors depending

on the gender of the pupils. Female pupils used these two learning styles more in their learning than male pupils. Also, we saw from the given table that there was no statistically significant difference in the representation of the style of theorists and the representation of the style of pragmatists depending on the gender of the pupils.

Table 3: Results of testing differences in the representation of learning styles among respondents of different genders

Learning style	Gender	N	Average rank	z	p
Activists	male	411	375,77	-3,180	0,001
	female	390	425,58		
Thinkers/Reflectors	male	410	379,95	-2,531	0,011
	female	389	421,14		
Theorists	male	411	403,86	-0,298	0,766
	female	381	399,02		
Pragmatists	male	410	398,33	-0,273	0,785
	female	390	402,78		

3.2 Differences in learning styles in pupils depending on their age

In the second task, we assumed that there was a statistically significant difference in learning styles in pupils depending on the grade they attend. Testing for differences was performed by the Kraskal-Wallis test. Table 4 shows the results of testing differences in learning styles in pupils depending on the grade pupils attend.

Table 4: Kraskal-Wallis test of differences in learning styles in pupils depending on the grade pupils attend

Learning style	Grade	N	Average rank	X^2	Df	p
Activists	7th grade	263	3886,76	4,501	2	0,105
	8th grade	290	391,95			
	9th grade	249	426,52			
	Total	802				
Thinkers/Reflectors	7th grade	261	392,68	0,681	2	0,711
	8th grade	291	398,60			
	9th grade	248	409,31			
	Total	802				
Theorists	7th grade	262	394,01	0,457	2	0,796
	8th grade	291	403,16			
	9th grade	249	407,45			
	Total	802				
Pragmatists	7th grade	263	378,44	4,524	2	0,104
	8th grade	289	402,30			
	9th grade	240	421,62			
	Total	802				

From Table 4, based on X^2 and its level of significance, we conclude that there is no statistically significant difference in the prevalence of learning styles among pupils depending on the grade pupils attend.

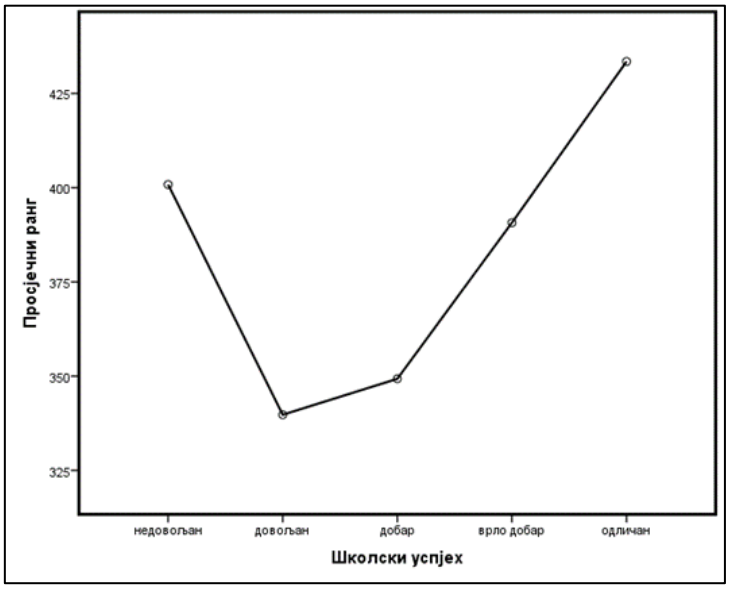
3.5 Differences in learning styles in pupils depending on their school success

In the third task of the research, we assumed that there was a difference in the representation of learning styles in pupils depending on their school success in learning. We tested the differences using the Kraskal-Wallis test. Table 5 shows the results of testing the differences in the representation of learning styles in pupils depending on the general school success.

Table 5: Kraskal-Wallis test of differences in learning styles in pupils depending on the school success pupils achieve in learning

Learning style	Success	N	Average rank	X^2	df	p
Activists	Insufficient	3	375,00			
	Sufficient	22	400,25			
	Good	137	394,59	0,838	4	0,933
	Very good	300	394,62			
	Excellent	340	409,51			
Thinkers/Reflectors	Insufficient	3	465,67			
	Sufficient	20	340,88			
	Good	137	370,97	5,653	4	0,227
	Very good	300	397,30			
	Excellent	339	417,03			
Theorists	Insufficient	3	475,00			
	Sufficient	22	314,35			
	Good	138	353,66	17,177	4	0,002
	Very good	301	390,20			
	Excellent	340	435,40			
Pragmatists	Insufficient	3	400,83			
	Sufficient	22	339,75			
	Good	138	349,30	17,747	4	0,003
	Very good	299	390,71			
	Excellent	340	433,46			

Graph 1: Average rank of scores in pupils achieving different school success regarding the inventory for measuring the theorist's style



Graph 2: Average rank of scores in pupils achieving different school success regarding the inventory for measuring the pragmatist's style

From Table 5, we can see that there is no statistically significant difference in the representation of styles of activists and thinkers/reflectors depending on school success pupils achieve in learning. But there is a statistically significant difference in the representation of styles of theorists and pragmatists depending on school success.

The research aim of this paper was to examine whether there was a difference in the prevalence of learning styles in pupils depending on their gender, age and school success. In this paper, the Inventory for Measuring Learning Styles from Honey and Mumford, who based their typology of styles on Kolb's learning cycle, was applied to identify learning styles. They identified four styles: activists, reflectors/thinkers, theorists, and pragmatists (Honey and Mumford, 1992). We have taken the given typology as a basis for examining learning styles.

The results of the research showed that there was a statistically significant difference in the representations of the styles of activists and thinkers/reflectors depending on the pupils' gender. It was proven that female pupils showed more those two learning styles in their learning than male ones, considering that in their work activists preferred work and experience, and they learned on the basis of knowledge actively participating in the learning process. One of the possible explanations for such differences is the fact that female pupils are involved in the learning process without prejudice, they are more careful and responsible in performing tasks, they have more specific experience, they like to be involved in work and that is a special pleasure for them. Probably, male and female pupils are similar in some characteristics connected with the behavior specific of the styles of theorists and pragmatists, so there is no confirmed difference. Many studies addressing the issue of connection of gender and preferred learning styles have obtained inconsistent results. Several studies have shown that there are differences between preferred learning styles depending on the gender of pupils (Heffler, 2001; McCabe, 2014), while other studies have not proven that there are

significant differences between male and female pupils (Brew, 2002, Kayes, 2005, Yilmaz, Salih, Kerem, 2011). There are results (Montgomery & Groat, 1998) stating that the assimilator style is present in 48% of men and only 20% of women. In women, the preference for these styles is more evenly distributed, while the diverger and the converger styles appear to be the most common. This means that women are more suited to learning with a teacher who acts as a motivator to students, while men are more suited to a teacher in the role of an expert.

In this paper, there is no significant difference in the prevalence of learning styles among pupils depending on the grade they attend. When it comes to differences in learning styles depending on the age of pupils, Kolb and Kolb (2005a) indicated that with the increase in the age of the respondents, the tendency towards abstraction also increased. The lack of difference in pupils learning styles between seventh and eighth, eighth and ninth, as well as seventh and ninth grade can be explained by the fact that there is a small chronological difference between grades, and that students are educated within the same school context.

When it comes to differences in learning styles depending on pupils' school success, there is no statistically significant difference in the representation of styles of activists and thinkers/reflectors, but there is a statistically significant difference in styles of theorists and pragmatists depending on school success. One of the reasons that may indicate why there is a statistically significant difference in the representation of learning styles between theorists and pragmatists depending on the school success they achieve could be that pupils who use the theorist's style in their learning want to understand the content they learn, master it, they think logically and their questions are clear. Such pupils achieve better learning outcomes than those who do not approach learning in this way. Pupils with a pragmatic style like to experiment, to apply their knowledge practically, which is also a quality of good pupils, ie those who achieve better results in learning. The representation of the theorists and the representation of the pragmatists are growing with pupils with better school performance. The responses of pupils who achieve insufficient learning success can be ignored for the reason that there are only three of them. Based on these results, we can conclude that students who achieve better school success use the styles of theorists and pragmatists in their learning. Having in mind all the above, it is obvious that very good and excellent pupils use the mentioned learning styles. The influence of school success on the choice of learning styles is significant, because often the learning style is determined as an advantage for school achievement. In itself, the motive for achievement is what motivates pupils to learn, and awareness of the results of their work further encourages them to find different learning styles. The results of previous research by Dunn, Beaudry & Klavas (1989), Chuah Chong-Cheng (1988) showed the importance of learning styles for school achievement (Abidin, Rezaee, Abdullah, Singh, 2011). Felder & Henriques (1995) believe that pupils learn more when they are given information in different approaches than when one approach is applied. Vermunt (1998) in his research came to the conclusion that unfocused learning style was low and negatively correlated with academic success, while learning style focused on meaning was in low positive correlation with academic achievement. Particularly

interesting and important for teaching practice is the finding of an experimental study (Spurlin, 2003, according to: Felder & Brent, 2005) which showed that teaching conducted to include all four cycles of Kolb's theory of experiential learning, contributed to more efficient learning and better achievement and those pupils who, in addition to traditional teaching, achieved lower success.

In the end, we can say that the results of the research showed that pupils used different learning styles, that female pupils preferred the activist's and thinker's styles. School success is one of the variables that shows and significantly determines the application of learning style in pupils. The determination of learning style itself can contribute to more exact management of the learning process and better school success of pupils (Stojaković, 2006). Research has shown that the pupils achieving the best results are both the students who mostly apply the theorist's style and the pragmatist's style.

4. Conclusion

The concept of learning styles is based on the idea that pupils have different learning styles and approach them in different ways. Raising the quality of the process of upbringing and education refers to the knowledge and recognition of pupils' learning styles. In order to achieve that, it is necessary that those who deal with upbringing and education have certain knowledge and skills that will enable them to notice the differences between pupils, ie. to know how learning styles, affect pupils' attitudes toward teaching and learning. It is important to emphasize that learning styles are not a static characteristic. Knowledge of pupils' learning styles enables monitoring of the impact on the learning process and development of certain abilities in pupils, enables achievement of individual educational goals, introduction of innovations that encourage pupils to work and learn independently, achieving better communication among participants in the educational process.

Acknowledgements
In practical terms, the results obtained in this research indicate the need for continuous training of pupils on the importance of learning styles in achieving better school achievement. The general success at the end of the school year, as a criterion expressed only by one grade, does not provide information on the subject areas and methods of evaluation. It would be interesting to get results regarding the fact which of the mentioned styles is used in the social sciences and which one in the natural sciences. There is a lack of information on teacher teaching styles that may be, more or less, matched with pupils' learning styles.

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Ranka Perućica, doctor of pedagogical sciences, employed as a professor at the Medical Faculty of the University of East Sarajevo. Master's degree obtained at the Faculty of Philosophy of UES, and PhD in 2017 on the topic "The role of teachers and parents in shaping the students' relationship to learning" at the same faculty. He is the author of

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