

The Gender Gap in the Algerian Learners' Academic Achievements: The Case of the BEM Exam in Bordj Bou Arreridj

Date of reception: 15/01/2019

Date of acceptance: 13/06/2019

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Abstract

The gender factor can be taken as a variable in comparative studies when dealing with students' achievements at schools. This study aims, basically, at investigating the status of the gender gap in Algerian learners' academic achievements. The present paper focuses on a population consisting of 32839 fourth year middle school pupils of the wilaya of Bordj Bou Arreridj in the official exam taken at the end of the middle school level (BEM) from 2015 to 2017. The results revealed that female learners outperform males in almost all subjects of study and in the overall success rates. This study, therefore, will serve as a cornerstone for further research seeking an understanding of the relationship between learners' academic outcomes and learners' gender in larger populations.

Key Words: Gender gap, learners' gender, academic achievements, BEM exam, case study.

Résumé

La question du sexe de l'apprenant est considérée comme l'un des paramètres primordiaux que l'on doit prendre en considération dans les études comparatives portant sur les résultats scolaires. Sur cette base, La présente recherche vise essentiellement l'étude de la situation de l'écart des résultats scolaires obtenus par les apprenants des deux sexes, à savoir ceux des filles et ceux des garçons. L'article en question tend à analyser les résultats d'un groupe-échantillon composé de 32839 apprenants des deux catégories de la 4^e année moyenne dans la wilaya de Bordj Bou Arreridj (Algérie) lors du brevet (B.E.M) des années scolaires consécutives suivantes : 2014/2015, 2015/2016 et 2016/2017. En effet, Les résultats requis ont démontré que le taux de réussite chez les filles est plus élevé que celui des garçons, toutes matières confondues et de façon remarquable. De ce fait, ces résultats seront d'une importance majeure dans les recherches à venir et qui viseront l'atteinte d'une compréhension meilleure de la relation unissant le sexe de l'apprenant aux résultats scolaires acquis, et ce, sur un public plus étendu.

Mots clés : l'écart entre les deux sexes, sexe des apprenants, résultats scolaires, BEM, étude de cas.

الملخص

يُعدّ جنس المتعلّم واحداً من بين المعايير التي يمكن أخذها بعين الاعتبار في الدراسات المقارنة للنتائج الدراسية للتلاميذ. على هذا الأساس ، يهدف هذا البحث الى دراسة وضعية الفجوة في النتائج الدراسية بين الجنسين. تستهدف هذه الورقة البحثية عينة تتكون من 32839 تلميذاً وتلميذة في السنة الرابعة متوسط بولاية برج بوعريّيج اجتازوا امتحان شهادة التعليم المتوسط لسنوات 2015-2016-2017 على التوالي. أظهرت نتائج الدراسة أنّ الإناث يتفوقون على الذكور على كل الأصعدة بنسب متفاوتة. هذه النتائج ستكون ذات أهمية كبيرة في دراسات قادمة تهدف الى التوصل الى طبيعة العلاقة بين جنس التلاميذ ونتائجهم الدراسية وذلك بدراسة الظاهرة لدى عينات أوسع

الكلمات المفتاحية: الفجوة بين الجنسين ، جنس المتعلمين ، النتائج الدراسية ، امتحان شهادة التعليم المتوسط ، دراسة عينة.

Introduction

Gender differences in educational outcomes have been tackled even before the emergence of feminism as a movement during the 1970s. The gender gap in education was, at first, in favour of males due to some social, cultural and political reasons and some subjects, such as science, maths and boys notably dominated physics. Nevertheless, many scientific studies, educational journals and brochures as well as media reports highlight what is referred to now as *the reverse gender gap* (Kadaba, 2013) in different parts of the world and stress that the situation has changed in favour of girls (Weis, Heikamp & Trommsdorf, 2013).

Some studies, such as Maccoby and Jacklin (as cited in Becker, 1986), pose that each gender outperforms the other in some disciplines and domains due to the biological, cognitive and psychological differences between them. The results of the previously stated study were summarised as follows: “(1) boys do better on visual-spatial tasks, (2) girls do better on verbal skills, and (3) boys do better on mathematical tasks.” (p.367)

Research works, investigating the gender gap in academic achievement and school attainment, were conducted in different parts of the world and addressed populations from all continents. To start with, and in an attempt to give an explanation to what he called *the international consistent finding of boys achieving less than girls at schools*, Van Houtte (2004), conducted a research taking as a population 3760 pupils in the third and fourth years of secondary education from 34 schools in Flanders (Belgium) to test two hypotheses: 1- boys' culture is less study oriented than girls' culture; and 2- the gender-specific study culture influences the academic achievement of both boys and girls. In fact, these two hypotheses were confirmed by the results of the research. Yet, the study came out with an interesting finding that the study culture of boys in vocational schools influences negatively their academic achievements in the fourth year.

The ministry of education in Québec (2004) published a report, in which they presented the situation of the academic delay of boys in both elementary and secondary schools, the results of the research for orienting intervention strategies, and the types of intervention strategies applied to help boys perform better. In the province of Québec, according to the Ministère de l'Éducation, de l'Enseignement supérieur et de la Recherche (2015):

Elementary school normally lasts six years; secondary school, five. Children are admitted to the first year of elementary school in the school year in which they will have turned six years old by October 1. School attendance is compulsory until the year in which students turn 16 years old, which normally corresponds to Secondary IV. (p.11)

Secondary schooling in Quebec is based on a five-year program divided into two "cycles" and learners start the first cycle at age 12. In Algeria, the equivalent level at this age is second-year middle school.

The report by the ministry of education in Quebec (2004), referred to in the previous paragraph, states that boys, in general education in Quebec, are more likely to repeat a year and that “In the school system as a whole, 3.8% of boys and 2.3% of girls repeated a grade in elementary school in 2001-2002. ... For Secondary I students, this difference rises to 5.6 percentage points, since the proportion of repeaters is 15.7% for boys and 10.1% for girls.” (p.3)

Younger, Warrington, Gray, Rudduck, McLellan, Bearne, Kerchner and Bricheno (2005) published a report entitled *Raising Boys Achievements* that explains the work they achieved in a four-year project (2000-2004) in primary (key stages 1 & 2) and secondary schools (key stages 3-5) in England. This project “...focused on issues associated with the apparent differential academic achievement of boys and girls at key stage 2 and key stage 4” (Younger et al., 2005, p.8). It is important, here, to clarify that learners at the end of key stage 2

are 11 years old; while at the end of key stage 4, they are 16 years old. Hence, the age range between the two stages is similar to that of middle school pupils in Algeria. Besides, having stressed that the debate about boys' under-achievement and its extent in English schools has emerged clearly in the 1990s, the report states that more boys than girls fail to achieve level 4 in English national tests at the end of key stage 2 (ages 7 to 11), and rather more boys than girls fail to achieve the 5 A*- C benchmark grades in GCSE examinations taken at the end of key stage 4 (ages 14 to 16). The authors, also, explain that the report "... highlights some of the dilemmas which are implicit within the debate, explores different interpretations and perspectives about boys 'under-achievement', and challenges some common misconceptions." (Younger et al. 2005, p.8).

In their article, Vialle, Thomson and Clark (2008) presented a number of works conducted in different parts of the world that demonstrate, in most cases, a gender gap according to statistical achievement data. The following are some studies, whose findings were presented in the aforementioned article: National Centre for Educational Statistics [NCES] (2004), indicates that "fourth grade girls significantly outperformed boys in every G8 country (Canada, France, Germany, Great Britain, Italy, Japan, Russia, and the United States), that participated in the 2001 Progress in International Literacy Study (PIRLS)" (Vialle et al. 2008, p.3). In another work, NCES (2006) states that "Fifteen-year-old girls outperformed boys among the 25 Organization for Economic Cooperation and Development (OECD) countries participating in both the 2000 and 2003 Program for International Student Assessment (PISA)". UNESCO (2004) reveals that: "Longitudinal studies in the United Kingdom indicate that girls make better progress than boys in reading, mathematics, and verbal and non-verbal reasoning".

Moreover, Vialle, Thomson and Clark (2008) went beyond mere analysis and discussion of male and female learners' achievements and the level at which males' underachievement seems to be manifested to investigating the factors contributing to

gender differences in educational attainment. These issues were addressed in the study that was conducted by students from three universities in three different countries (USA, UK, and Australia), from three different continents. This research work targeted a population of pupils whose ages range between 11 and 18 years old, which means that a great proportion is of the same age as Algerian middle school learners (ages 11-16). The two groups of students in the U.S. and the U.K. (who are in fact pre-service educators) first discussed issues of gender in the schools they were engaged in, and "then generated themes, research questions, and interview questions in their respective classes. These interview questions were then used with focus groups of secondary students (ages 11-18) in local schools. Interview notes were taken, and compiled into an interview summary written by a recorder in each focus group."

The situation in Algeria in this concern, according to the reports-mainly published by the media- does not seem to be different from what is happening worldwide. This comes in disfavour of the medium and long term objectives set by the ministry of national education aiming at ensuring equal school attendance rates among males and females in all educational levels (Education Law, 2008, p.56). The official reports by the ministry concerning the rates of success based on the gender factor indicate that the aforementioned objectives are not achievable in the medium term and not even in the long term if no practical measures to arrive at a balance in males and females' academic achievements are taken. Aissa (2010), from El Chorouk Al Yawmi newspaper, describes the fact, that 2/3 of successful candidates in the BAC exam are females as a phenomenon that should be put under scrutiny. Similarly, Himar (2011), from El Massa newspaper, published an article cited in djazairss website entitled "Females Outperformance in Schooling: Between Reality and Exaggeration". This latter investigates the perceptions of people, who are parts of the educational system (learners, parents, teachers, inspectors, school heads) as well as specialists in education and sociology. They all think that females

perform better than males in school exams but they disagree on whether to call it “a phenomenon” or not and whether this outperformance is partial or in all school subjects. This, they think, is due to males' underachievement more than females' excellence. Hence, it is important to find ways to increase boys' achievements while appreciating females ones.

1. *Rationale and Purpose of the Study*

Theoretically speaking, the problem of boys' underachievement exists also in Algeria. However, academic studies dealing with males and females' academic achievements in Algerian educational institutions are rare. The investigations carried out by the ministry of education about the reasons behind this phenomenon did not end up with detailed reports, which are overtly published. A fact that is regrettable regarding the benefits of analysing and discussing such documents among the educational community. This study, then, has as an aim to analyse learners' results in order to have a concrete evidence about the existence of “the phenomenon” in Algerian schools, to determine the school subjects, which are dominated by each gender; and finally, to set up a platform for the coming research to find out the reasons behind those differing school outcomes.

2. *Methodology*

This part presents the research questions, design and method of the research as well as the participants and the research procedure.

2.1. *Research Questions*

1. Is there a gender gap in the 2015-2017 BEM exams' results in Bordj Bou Arreridj?
2. In which subjects do male and female learners outperform each other?

2.2. *Research Design and Method*

The present study is a case study research that aims at exploring the state of affairs concerning the performance of male and female learners in the BEM

exam as a whole and in its different subjects taken separately. It makes use of the quantitative method of data collection, analysis and interpretation. Walliman (2011) states that “Quantitative analysis deals with data in the form of numbers and uses mathematical operations to investigate their properties.” (p.113)

2.3. *Participants*

All male and female pupils of the Wilaya of Bordj Bou Arreridj, Algeria who sat for the BEM exams in the years 2015, 2016, and 2017 were chosen to be the population of this study. The total number of participants is 32839 male and female middle school learners. They are of different ages, from different socio-economic status and study in middle schools within the territory of the wilaya of Bordj Bou Arreridj. The number of institutions participating in the study is 127 (BEM 2015&2017) and 121 (BEM2016).

On the one hand, the choice of the BEM exam is simply based on the following facts that give its results a high degree of reliability and significance:

- it is an official exam,
- it mediates between two important phases of obligatory schooling in the Algerian educational system,
- its correction is anonymous,
- it is corrected outside the original wilaya.

On the other hand, the researcher has teaching experience with middle school learners in the wilaya of Bordj Bou Arreridj. This led to noticing that male and female learners' performances at school exams in general, and at the BEM exam specifically, were unbalanced; and hence, opting for fourth-year middle school learners in the years 2015,2016 and 2017 to be the population of the present study.

Tables 2.1; 2.2; 2.3 below present the statistics concerning the population targeted in the study.

Table2.1: BEM 2015 Population

Number of pupils registered for the BEM 2015 exam					Number of pupils present in the BEM 2015 exam				
Total	male	%	female	%	Total	Male	%	female	%
11153	5399	48.40	5754	51.60	11018	5337	48.43	5681	51.57

Note. Adapted from BEM 2015 statistics by the centre of schooling and vocational guidance in B.B. Arreridj.

Table 2.2: BEM 2016 Population

Number of pupils registered for the BEM 2016 exam					Number of pupils present in the BEM 2016 exam				
Total	male	%	Female	%	Total	Male	%	female	%
10900	5307	48.69	5593	51.31	10792	5267	48.80	5525	51.20

Note. Adapted from BEM 2016 statistics by the centre of schooling and vocational guidance in B.B.Arreridj

Table 2.3: BEM 2017 Population

Number of pupils registered for the BEM 2017 exam					Number of pupils present in the BEM 2017 exam				
Total	male	%	female	%	Total	Male	%	Female	%
11164	5407	48.43	5757	51.57	11029	5345	48.46	5684	51.54

Note Adapted from BEM 2016 statistics by the centre of schooling and vocational guidance in B.B.Arreridj.

2.4. Research Tools and Procedure

The statistics concerning the learners' rate of success in the BEM exam in general, in addition to detailed records of their achievements in the subjects they were tested in, were provided by the local academy of education (precisely the service of school guidance). A gender-based organisation was adopted to enter data into the Statistical Package for Social Sciences (SPSS) software used to analyse it. Each gender was assigned a numerical value within SPSS datasheet. Hence, males were coded as '1' and females as '2' (with no stereotypical images or connotations that males are superior or have to be first-mentioned).

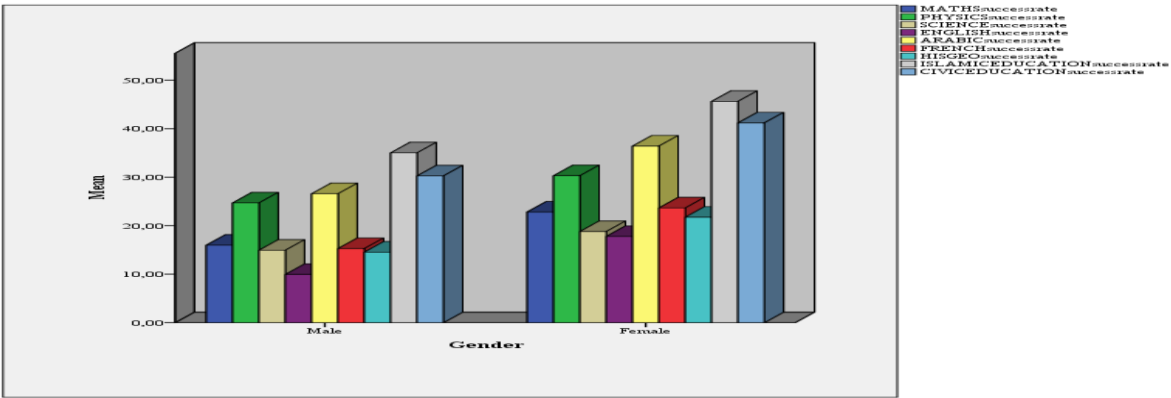
Data were analysed in terms of a gender-based comparison between the general means of success

Table 3.1: Means of BEM 2015 Success rates of Male and Female Learners

	N	Gender	Mean	Std. Deviation	Std. Error Mean
BEM successrate	127	Male	21,1013	8,29148	,73575
	127	Female	31,1457	9,90845	,87923

Note. N=Number; Std. =Standard. This table was created by the author.

Fig. 3.1: Female and Male Achievements in BEM 2015 Subjects



Note. The figure was created by the author.

Table 3.1 above shows that whereas males’ rate of success in the BEM exam is 21.10 % females show a better performance with 31.14%. Moreover, figure 3.1, which is a bar chart comparing males and females’ performance in the BEM exam subjects (Maths, physics, natural sciences, English, Arabic, French, Islamic education, civic education, in addition to history and geography) reveals that female learners outperform males in all subjects without exception.

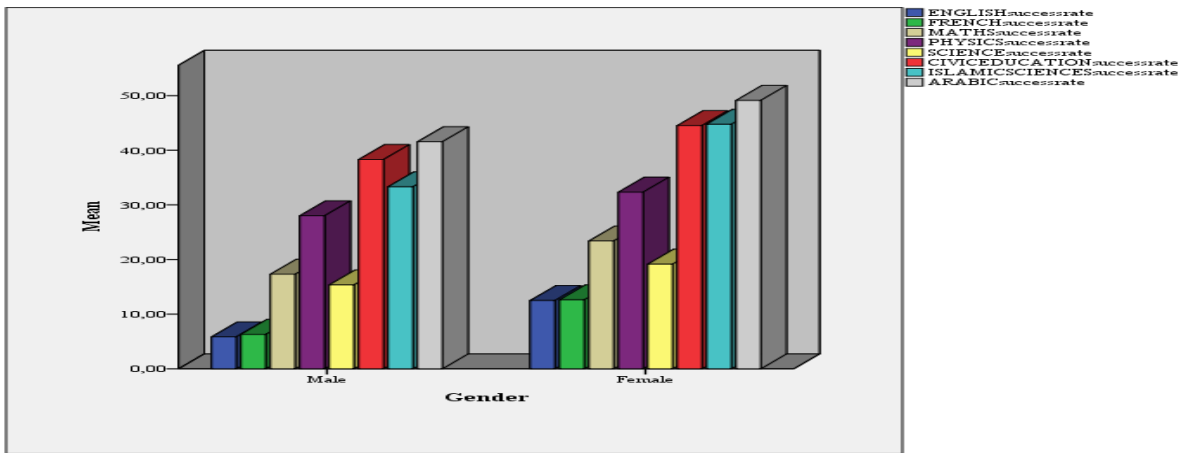
3.2. BEM 2016

Table 3.2: Means of BEM 2016 Success rates of Male and Female Learners

	N	Gender	Mean	Std. Deviation	Std. Error Mean
BEM success	121	Male	39,9101	10,27761	,93433
rate	121	Female	60,0403	10,19940	,92722

Note. N=Number; Std. =Standard. The author created this table.

Fig. 3.2: Female and Male Achievements in BEM 2016 Subjects



Note. This figure was created by the author.

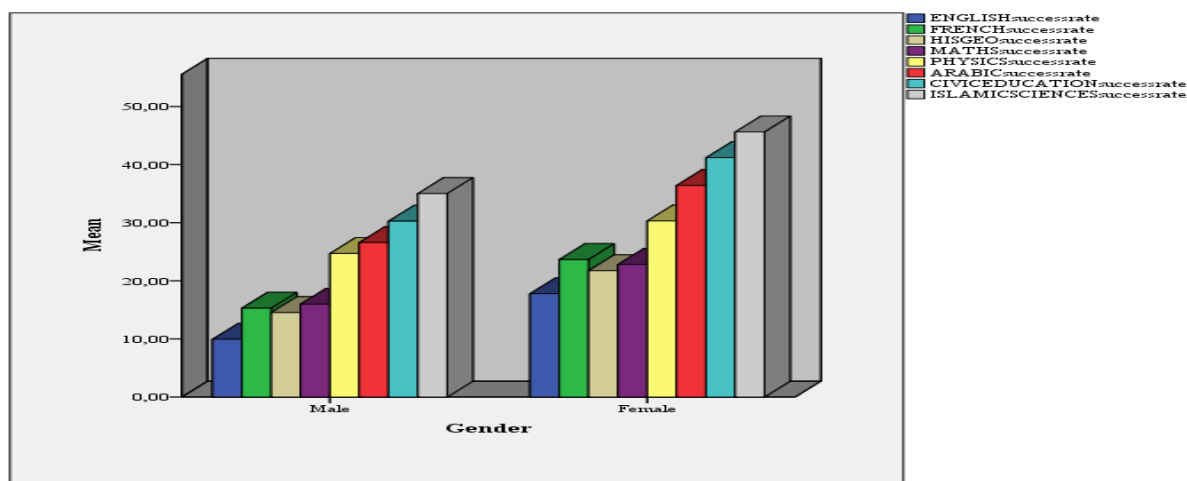
The results displayed in table 3.2 and figure 3.2 respectively are not very different from the previous ones apart from the relatively higher success rate in the BEM exam (39.91% for males and 60.04% for females).

3.3. BEM 2017

Table 3.3.: Means of BEM 2017 Success rates of Male and Female Learners

	N	Gender	Mean	Std. Deviation	Std. Error Mean
BEM Success	127	Male	21,0538	8,36498	,74227
rate	127	Female	31,1457	9,90845	,87923

Note. N=Number; Std. =Standard. This table was created by the author.

Fig. 3.3: Female and Male Achievements in BEM 2017 Subjects

Note. This figure was created by the author.

Again, table 3.3 and figure 3.3 show that the results are in favour of females.

4. Discussion

The results displayed in the above tables and figures provide clear and precise answers to the previously raised questions.

4.1. The Existence of a Gender Gap in Learners' Academic Achievements

In response to the first research question, the results show that, indeed, a gender gap exists in the performance of female and male learners in the 2015-2016-2017 BEM exams, and that gap is in favour of females in all of them. This comes to support the results obtained by the previous studies and the various reports and published articles (e.g. Van Houtte, 2004; the ministry of education (Quebec), 2004; Younger et al., 2005; Vialle et al., 2008) claiming that females outperform males in educational outcomes.

Whereas BEM 2015 and 2017 success rates are not very different (females: 31.14% in both years, and males: 21.10% & 21.05% respectively), the rates of success of both boys and girls in BEM 2016 are much higher (females: 60.04%, and males: 39.91%).

The above statistics confirm the existence of the phenomenon of the reversed gender gap in education that is widely acknowledged by the Algerian society. Although the good performance of females is to be encouraged, the gap has to be reduced

and solutions to raise the performance of boys in exams are more than necessary.

The consistency in girls' good performance in the overall BEM exam success rates compared to the underachievement of boys leads us to discuss both genders' results in the subjects in which they are examined.

4.2. School Subjects Dominated by Females/Males

This part discusses the results and answers the second research question. The newspaper articles discussing the underachievement of Algerian male learners in the official exams did not provide details concerning the school subjects that are still dominated by male learners. They simply compared the rates of success of learners and commented on the fact that the gap between the genders in education is a phenomenon that needs to be investigated. In addition to that, the results of some studies that were referred to in the introduction of this paper conclude that girls outperform boys in some disciplines and skills such as verbal skills (Maccoby & Jacklin, 1974); and reading, mathematics, and verbal and non-verbal reasoning (UNESCO, 2004); while boys do better on visual-spatial tasks and on mathematical tasks (Maccoby & Jacklin, 1974).

Surprisingly, the results of the present research indicate that girls do better in all school subjects in all of the three BEM exams (i.e. 2015, 2016 and 2017). Female learners got better rates of

success (average mark or beyond i.e. a mark that is equal to or beyond ten (≥ 10)) in all the subjects in which they were examined than those obtained by their male counterparts.

An analysis of the bar charts, which display the success rates of the learners in each school subject in the three BEM exams analysed shows that girls have better results in human and social sciences subjects (history and geography, civic education, and Islamic education) that, basically, rely on rehearsal and memory. They also show a better performance than male learners in Languages (English, Arabic, and French). In the BEM exam, these latter are generally tested in terms of reading comprehension, grammar and writing. Finally, and more importantly, girls do better than boys in mathematics, physics, and natural sciences, which have always been thought about to be masculine subjects. Hence, girls left nothing for boys to dominate.

Conclusion

In this paper, the quest for concrete statistical evidence about the existence of a gender gap in the academic achievements of Algerian learners has been satisfied. The study focused on a population

composed of fourth-year middle school students of the wilaya of Bordj Bou Arreridj who sat for the BEM exam in the years 2015, 2016, 2017 respectively. The results of the quantitative analysis of male and female learners' rates of success in the exam as a whole and in the exam subjects taken separately have shown that female learners outperform males in all aspects with differing rates. The results of this study reinforce the stand of some media reports and articles based on declarations by the ministry of education about males being lagged behind females in education. It proved the existence of what is internationally known as "The Reverse Gender Gap" in Algeria. Nevertheless, the results of females in science, maths, and physics, basically, reveal that the subjects that have been considered as masculine ones are no more dominated by males. The problem that arises then is not about females' achievements but concerns males under-achievement. Hence, a serious, deep investigation of the factors leading to the present situation is needed. Further research must explain the nature of the relationship between learners' academic achievements and all the internal and external factors acting within the Algerian educational setting.

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