

A Decade of Medical Pharmacology Speciality and Ph.D. Theses in Turkey: A Comparative Study

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ABSTRACT

Objectives: This study aimed to analyse the characteristics and publication trends of medical pharmacology speciality and Ph.D. theses. **Materials and Methods:** Medical pharmacology theses published in Turkey between 2010 and 2020, were included. Data on the study topic, funding source and publication year, were collected from the National Thesis Center's online archive. A follow-up search was conducted to evaluate the publication status of the theses, using databases such as the Web of Science, PubMed, Google Scholar and TR-Dizin. **Results:** Our study found that the proportion of specialty theses that did not receive funding was higher, compared to Ph.D. theses (47.9% and 33.3% respectively, $p=0.04$). In both the medical specialty and Ph.D. theses, neuropharmacology was the most common study topic at 31.1% and 41.5% respectively, followed by cardiovascular pharmacology at 21.1% and 19.5%, respectively. However, clinical pharmacology was a more prevalent topic in medical specialty theses (23.9%) than in Ph.D. theses (7.3%). About 48% of specialty and 60% of Ph.D. theses were published in academic journals. Furthermore, 73.5% of specialty and 71.6% of Ph.D. thesis articles were indexed in Science Citation Index Expanded (SCI-E). **Conclusion:** We noted differences in funding status and study topics between medical pharmacology specialty and Ph.D. theses. High publication rates in SCI-E journals indicate the impact of these theses in medical pharmacology. Our data showed a consistent focus on neuropharmacology and cardiovascular pharmacology topics in these theses, with an increasing attention on Clinical Pharmacology. Our findings provide guidance for postgraduate students, advisors and educational planners.

Keywords: Pharmacology, Ph.D. Thesis, Specialty Thesis, Research Trends, Bibliometric Analysis, Publication Status.

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INTRODUCTION

Postgraduate medical pharmacology education includes both basic and clinical pharmacology. Specialty and Ph.D. education are the two pathways of post-graduate education in medical pharmacology for medical school graduates in Turkey. The medical pharmacology specialty program emphasizes clinical pharmacology skills, whereas Ph.D. education emphasizes academic research and scholarly pursuits. Medical pharmacology specialty and Ph.D. programs are recognized as equivalent levels of education by the Higher Education Council of Turkey. Moreover, writing a thesis is mandatory in both programs.

The objective of having postgraduate student's author theses during their education is to equip them with valuable skills, including hypothesis formation, data collection, analysis, result

interpretation and article writing. Postgraduate students gain the methodological understanding and analytical abilities essential for conducting their research and sharing their research findings by conceptualizing and composing their thesis projects.¹ Writing a thesis enables them to pursue a career in academia and become proficient researchers.²

Publishing theses in academic journals contributes to scientific knowledge. Publishing journal articles of thesis serves as a performance indicator for postgraduate education, reflecting the students' ability to contribute to the field.³ Additionally, the impact of the article is also an important performance indicator, which can be evaluated by the journal's quartile ranking in indexes.⁴ High-quality publications in reputable journals further validate the impact of the student's research.

Furthermore, selecting a topic is the first step in thesis preparation and can significantly influence the impact of the thesis. An analysis of thesis topics within a field is an essential approach for identifying ongoing research trends.⁵ It can guide future studies, especially theses. Postgraduate students and advisors can also benefit from this information.



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To the best of our knowledge, few studies have examined the publication status of medical pharmacology theses in the literature. However, none have investigated the research and publication characteristics of medical pharmacology Ph.D. theses or compared them with specialty theses. Therefore, the objective of this study was to compare and present the characteristics of medical pharmacology Ph.D. and specialty theses focusing on publication years, study types and topics. Our aim is to provide guidance to postgraduate students, advisors and educational planners.

MATERIALS AND METHODS

Data Collection

Both medical pharmacology specialty and Ph.D. theses were searched in the online archive of the National Thesis Center of the Higher Education Council (<https://tez.yok.gov.tr/UlusalTezMerkezi>). Theses from medical pharmacology departments in Turkey, published between 2010 and 2020, were included in the study. The thesis title, study design, study topic, funding information and publication year of each thesis were collected from the database.

A further search was conducted to determine whether the theses had been turned into publications in scientific journals. The names and surnames of the authors and advisors, as well as the titles of the theses, were searched in both Turkish and English on the Web of Science (<https://www.webofscience.com/wos>), PubMed (<https://pubmed.ncbi.nlm.nih.gov/>), Google Scholar (<https://scholar.google.com/>) and TR-Dizin (<https://trdizin.gov.tr/>). Subsequently, databases that indexed the journals that published those theses were determined. This information was gathered by examining the journal websites and Science Citation Index-Expanded (SCI-E), PubMed, Scopus and TR-Dizin databases. For journals indexed in the SCI-E, quartile information at the time of publication (Q1, Q2, Q3 and Q4) was recorded.

The study was approved by Selcuk University Ethics Review Board (Protocol Number:2023/492).

Statistical Analysis

The numerical data were presented as means and Standard Error of the Mean (SEM). Categorical variables were presented as numbers and percentages. Categorical data were analysed using the Chi-square test.

Shapiro-Wilk and D'Agostino Pearson normality tests were used. Two-tailed Student's t-test was used to compare numerical data (number of authors and time to publishing in a journal). Mann-Whitney test was used for data that did not follow a normal distribution. A significance level of $p < 0.05$ was accepted for all statistical evaluations. Statistical analysis were performed using GraphPad Prism version 6.01 for Windows (San Diego, CA, USA).

RESULTS

A total of 194 medical pharmacology specialty ($n=71$) and Ph.D. theses ($n=123$) published in the National Thesis Center database between 2010 and 2020 were included in the study.

First, specialty theses and Ph.D. theses were compared in terms of study type and funding sources. Animal studies were more frequent in Ph.D. theses (70.7%) compared to specialty theses (60.6%). Conversely, clinical studies were less frequent in Ph.D. theses (10.6%) as compared to specialty theses (16.9%). However, the differences in study types between the two groups were not statistically significant ($p=0.59$).

Our study showed that a significantly higher percentage of specialty theses (47.9%) received no funding than that of Ph.D. theses (33.3%, $p=0.04$, Table 1). Additionally, university funding for specialty theses (83.8%) was higher than that for Ph.D. theses (74.4%). On the other hand, the percentage of Ph.D. theses funded by National Funding Agencies (25.6%) was greater than that of specialty theses (16.2%). However, these differences in funding sources between the two groups were not statistically significant ($p=0.41$). The study types and funding sources for Medical Pharmacology specialty and Ph.D. theses are presented in Table 1.

Second, specialty theses and Ph.D. theses were compared in terms of study topics. In both medical specialty and Ph.D. theses, the most common study topics were neuropharmacology (31.1% and 41.5% respectively) and cardiovascular pharmacology (21.1% and 19.5% respectively). However, clinical pharmacology had a higher proportion of medical specialty theses (23.9%) compared to Ph.D. theses (7.3%). Table 2 presents a comparison between medical specialty theses and Ph.D. theses in terms of study topics and a chi-square test resulted in a p -value of 0.06, indicating a trend towards significance.

Third, the publishing status of medical specialty and Ph.D. theses was compared. It was found that 48% of medical specialty theses and 60% of Ph.D. theses were published in a scientific journal. However, when the publication status and indexes of the journals in which the theses were published were compared between the specialty theses and the Ph.D. theses, no statistically significant differences were found ($p=0.09$ and $p=0.45$, respectively, Table 3). Moreover, we found that 73.5% of articles originating from medical specialty theses and 71.6% from Ph.D. theses were indexed in the SCI-E. The highest percentage of specialty theses was published in SCI-Q3 journals (32.4%). On the other hand, most of the Ph.D. theses were published in SCI-Q2 journals (25.7%). Medical specialty and Ph.D. theses had a similar average number of authors (5.3 and 5.5, respectively, $p=0.9$) and time to publishing (2.8 and 2.9 years, respectively, $p=0.49$, Table 3).

Our study also focused on the publication status of theses across various pharmacology study areas. The highest publication rate

in SCI-E indexed journals was observed in oncology at 75%, followed by pharmacogenomics (55.6%). Neuropharmacology and cardiovascular pharmacology theses were also frequently published in SCI-E indexed journals, at rates of 47.9% and 43.6%, respectively. By contrast, gastrointestinal pharmacology and endocrine system pharmacology theses had the lowest rates of publication in SCI-E indexed journals at 9.1% and 20%, respectively (Table 4). Figure 1 presents a visual representation of changes in the distribution of study topics in medical pharmacology theses over time.

DISCUSSION

Our study showed that higher rate of specialty theses (47.9%) received no funding, compared to Ph.D. theses (33.3%, $p=0.04$, Table 1). Another study examining research conducted by pediatric specialty students found that an increase in project research funding positively affected the quantity, quality and impact of research papers.⁶ To improve the success rate of grant applications, research grant application workshops and classes were introduced within postgraduate education.⁷ These initiatives were found to boost the confidence of Ph.D. students in writing grant applications and increase the success of their thesis projects.^{7,8} Implementation of such workshops and classes in the medical pharmacology postgraduate education curriculum could potentially enhance the success rates of funding applications, as well as improve the impact and quality of specialty thesis publications.

In both medical specialty and Ph.D. theses, neuropharmacology (31.1% and 41.5%, respectively) and cardiovascular pharmacology (21.1% and 19.5% respectively) were the leading study topics. Moreover, more specialty theses (23.9%) were on the topic of clinical pharmacology than Ph.D. theses (7.3%). When comparing medical specialty theses and Ph.D. theses in terms of these study topics, a chi-square test yielded a p -value of 0.06,

suggesting a trend towards statistical significance. The scope of clinical pharmacology includes clinical trials, pharmacovigilance, pharmacoepidemiology, pharmacoconomics and rational prescribing.^{9,10} Application of the aforementioned areas of pharmacology in clinical settings is a major learning outcome in the medical pharmacology specialization curriculum, which includes specific modules in clinical pharmacology.^{10,11} Considering the essential role of clinical pharmacology in the daily practice of medical pharmacology specialists, we had anticipated a greater number of specialty theses focusing on this area. Although the current trends are promising, there is potential for improvement. Encouraging specialty students to pursue clinical research theses could promote greater engagement in clinical pharmacology skills and real medical environments, aligning with the programme's curricular emphasis on practical applications in clinical pharmacology.

Another aim of this study was to evaluate the publication status of medical pharmacology specialty and Ph.D. theses in scientific journals. We found that 48% of specialty theses and 60% of Ph.D. theses written between 2010 and 2020 were published in scientific journals. Furthermore, we observed that 73.5% of articles originating from specialty theses and 71.6% from Ph.D. theses were indexed in SCI-E. Another study investigating the publication status of medical pharmacology specialty theses found that 61 out of 108 theses written between 2006 and 2016 (56.5%) were published in scientific journals and 77.0% of these publications were indexed in SCI-E.¹² Other studies evaluating the publication rate of specialty theses across various medical disciplines have reported rates ranging from 27.1% to 57.3%.¹³⁻¹⁷ This indicates that the publication rates in medical pharmacology theses are notably higher than those in most other medical disciplines. The rates of SCI-E indexed thesis publications in other medical specialty disciplines were 83% for orthopaedics, 68% for physiology, 54% for emergency medicine, 53% for thoracic surgery and 34% for urology.¹³⁻¹⁷

Table 1: Study Type and Funding Sources of Medical Pharmacology Specialty and Ph.D. Thesis.

Study Type	Specialty Thesis <i>n</i> (%)	Ph.D. Thesis <i>n</i> (%)	<i>p</i> -value
Experimental Animal Studies	43 (60.5)	87 (70.7)	0.59
Cell Culture Studies	7 (9.9)	12 (9.8)	
Prospective Clinical Studies	12 (16.9)	13 (10.6)	
Retrospective and Survey Studies	7 (9.9)	9 (7.3)	
Literature Review	2 (2.8)	2 (1.6)	
Funding Status			
Funded	37 (52.1)	82 (66.7)	0.04
No Funding Information	34 (47.9)	41 (33.3)	
Funding Sources			
Funded by University	31 (83.8)	61 (74.4)	0.4
Funded by National Funding Agencies	6 (16.2)	21 (25.6)	

Table 2: Study Topics of Medical Pharmacology Specialty and Ph.D. Thesis.

Study Topic	Specialty Thesis	Ph.D. Thesis	p-value
	n (%)	n (%)	
Cardiovascular Pharmacology	15 (21.1)	24 (19.5)	0.06
Neuropharmacology	22 (31.1)	51 (41.5)	
Clinical Pharmacology	17 (23.9)	9 (7.3)	
Pharmacogenomics	3 (4.2)	6 (4.9)	
Genitourinary System	9 (12.7)	16 (13.0)	
Gastrointestinal Pharmacology	2 (2.8)	9 (7.3)	
Endocrine System Pharmacology	2 (2.8)	5 (4.1)	
Oncology	1 (1.4)	3 (2.4)	

Table 3: Publication Status of Medical Pharmacology Specialty and Ph.D. Thesis.

Publishing Status	Specialty Thesis	Ph.D. Thesis	p-value
	n (%)	n (%)	
Unpublished	37 (52)	49 (40)	0.09
Published	34 (48)	74 (60)	
Journal Index	n (%)	n (%)	p-value
SCI-E - Q1	4 (11.7)	8 (10.8)	0.45
SCI-E - Q2	9 (26.5)	19 (25.7)	
SCI-E - Q3	11 (32.4)	16 (21.6)	
SCI-E - Q4	1 (2.9)	10 (13.5)	
Other Indexes	9 (26.5)	21 (28.4)	
	Mean (SEM)	Mean (SEM)	p-value
Number of Authors	5.3 (2.4)	5.5 (2.8)	0.9
Time to publishing (years)	2.8 (1.9)	2.9 (1.5)	0.49

Quartile of a published journal's impact factor has been used in scientific research evaluation. This is particularly valid, given the limitations and incomparability of journal impact factors across various research areas.^{18,19} Therefore, our study also classified the quartiles of journals in which theses were published to evaluate the quality and impact of medical pharmacology theses. Our study showed that the highest percentage of medical pharmacology specialty theses was published in SCI-Q3 journals (32.4%), followed by SCI-Q2 (26.5%) and SCI-Q1 (11.8%). The majority of Ph.D. theses were published in SCI-Q2 journals (25.7%), followed by SCI-Q3 (21.6%) and SCI-Q1 (10.8%). These findings suggest a notable presence of medical pharmacology theses in esteemed scientific journals, which indicates substantial contributions of the theses to scientific literature.

In our study, the average times to publication for the medical pharmacology specialty and Ph.D. theses were 2.8 and 2.9 years respectively (Table 3). Another study assessing the publication rate of medical pharmacology specialty theses reported an average publication time of 3.20 years.¹² In consideration of this, we excluded thesis studies conducted after 2020 from our

study. Furthermore, our findings regarding the average time to publication were consistent with those of previous studies.

Our study revealed that oncology (75%) and pharmacogenomics (55.6%) theses had the highest publication rates in SCI-E indexed journals, followed by neuropharmacology (47.9%) and cardiovascular pharmacology (43.6%). Gastrointestinal pharmacology (9.1%) and endocrine system pharmacology (20%) had the lowest rates. The process of a dissertation heavily depends on the choice of an appropriate topic, as it guides its direction and success.²⁰ It may be beneficial to select a topic related to a current trend in the student's field of study, as it could enhance the likelihood of the thesis being published. In a rapidly updating field, such as pharmacology, staying aware of current research trends is crucial. Our study, therefore, evaluated the publication status of theses across various pharmacology sub-disciplines and analysed the distribution of medical pharmacology theses topics by publication year to gain insights into evolving research trends.

Neuropharmacology and cardiovascular pharmacology have remained popular fields of study over the past decade (Figure 1). Neuropharmacology showed a significant surge in 2017. Clinical

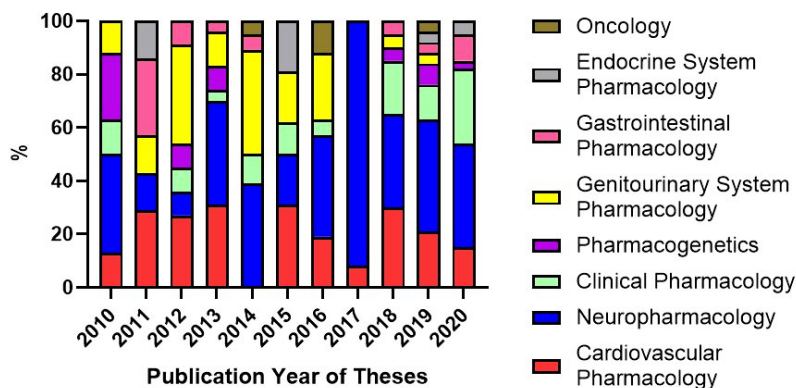


Figure 1: Distribution of Medical Pharmacology Theses Topics (Specialty+Ph.D.) by Publication Year.

Table 4: Publication Status of Medical Pharmacology Theses (Specialty+Ph.D.) by Topic of Study.

Study Topic	SCI-E n (%)	Other Indexes n (%)	Unpublished n (%)	p-value
Cardiovascular Pharmacology	17 (43.6)	7 (17.9)	15 (38.5)	0.25
Neuropharmacology	35 (47.9)	7 (9.6)	31 (42.5)	
Clinical Pharmacology	8 (30.8)	6 (23.1)	12 (46.1)	
Pharmacogenomics	5 (55.6)	1 (11.1)	3 (33.3)	
Genitourinary System	8 (32.0)	6 (24.0)	11 (44.0)	
Gastrointestinal Pharmacology	1 (9.1)	2 (18.2)	8 (72.7)	
Endocrine System Pharmacology	1 (20.0)	0 (0.0)	4 (80.0)	
Oncology	3 (75.0)	0 (0.0)	1 (25.0)	

pharmacology, while maintaining a relatively modest presence throughout most of the decade, has seen a substantial increase in the last three years. This suggests an increasing interest in this field, possibly driven by the rapidly evolving clinical applications of pharmacology. It is essential for students and researchers to note these trends when choosing thesis topics because trending topics may provide greater opportunities for publication and impact.

CONCLUSION

In conclusion, in this study we present the research and publication characteristics of medical pharmacology Ph.D. and specialty theses. To the best of our knowledge our study is the first to present the bibliometric characteristics and publication status of Ph.D. theses in medical pharmacology and compare them with medical pharmacology specialty theses. Notably, we observed differences, with borderline statistical significance, in funding status and research topics between medical pharmacology specialty and Ph.D. theses. High publication rates, particularly in reputable SCI-E indexed journals, emphasise the impactful performance of medical pharmacology education, confirming the significant contribution these theses make to the literature. Our

study also showed that neuropharmacology and cardiovascular pharmacology remain popular thesis topics. This suggests that the field is evolving with a growing variety of sub-disciplines, including the emerging importance of clinical pharmacology. Based on these findings, we aim to provide useful guidance for postgraduate students, advisors and education planners in the field of pharmacology.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

ABBREVIATIONS

Ph.D.: Doctor of Philosophy; **SCI-E:** Science Citation Index Expanded; **Q1:** First Quartile; **Q2:** Second Quartile; **Q3:** Third Quartile; **Q4:** Fourth Quartile; **SEM:** Standard error of means.

AUTHOR CONTRIBUTIONS STATEMENT

MCO and HB contributed to the conceptualization and design of the study. MCO and HB contributed to the acquisition, analysis and the interpretation of the data. MCO and HB drafted the article. All authors have contributed to the interpretation of the results and in preparation and review of the manuscript.

SUMMARY

This study aimed to analyze the characteristics and publication trends of medical pharmacology specialty and Ph.D. theses. Medical pharmacology theses published between 2010 and 2020 in Turkey, were examined. Our study found that the rate of specialty theses that did not receive funding were higher, compared to Ph.D. theses. About 48% of specialty and 60% of Ph.D. theses were published in academic journals. Furthermore, 73.5% of specialty and 71.6% of Ph.D. thesis articles were indexed in the SCI-E. Our data showed a consistent focus on neuropharmacology and cardiovascular pharmacology topics in these theses, with an increasing focus on clinical pharmacology. Our findings provide guidance for postgraduate students, advisors and educational planners.

REFERENCES

- Davis A, Wladkowski SP, Mirick RG. Lessons learned for successful Dissertation Completion From Social Work Doctoral Graduates. *J Teach Soc Work.* 2017;37(2):107-20. doi: 10.1080/08841233.2017.1295124.
- Piña A, MacLennan H, Moran K, Hafford P, The DB. Vs. Ph.D. in U.S. Bus Manag Programs Differ Degrees? 2015;4.
- Arriola-Quiroz I, Curioso WH, Cruz-Encarnacion M, Gayoso O. Characteristics and publication patterns of theses from a Peruvian medical school. *Health Info Libr J.* 2010;27(2):148-54. doi: 10.1111/j.1471-1842.2010.00878.x, PMID 20565556.
- Miranda R, Garcia-Carpintero E. Comparison of the share of documents and citations from different quartile journals in 25 research areas. *Scientometrics.* 2019;121(1):479-501. doi: 10.1007/s11192-019-03210-z.
- Mishra D, Gawde M, Singh M. Bibliometric study of Ph.D. thesis in English. 2014;1:19-36.
- Taschanchai N, Mahachoklertwattana P. Thirty-year pediatric residency research and publication productivity: association with research funding. *J Med Assoc Thai.* 2021;104(3).
- Kahn RA, Conn GL, Pavlath GK, Corbett AH. Use of a grant writing class in training PhD students. *Traffic.* 2016;17(7):803-14. doi: 10.1111/tra.12398, PMID 27061800.
- Kulage KM, Stone PW, Smaldone AM. Supporting dissertation work through a nursing PhD program federal grant writing workshop. *J Prof Nurs.* 2020;36(2):29-38. doi: 10.1016/j.profnurs.2019.08.001, PMID 32204857.
- Aronson JK. A manifesto for clinical pharmacology from principles to practice. *Br J Clin Pharmacol.* 2010;70(1):3-13. doi: 10.1111/j.1365-2125.2010.03699.x, PMID 20642541.
- Gulmez SE, Aydin V, Akici A. Footprints of Clinical Pharmacology in Turkey: past, present and future. *Clin Ther.* 2020;42(2):351-62. doi: 10.1016/j.clinthera.2019.12.014, PMID 31955969.
- Kurulu TU. Tıpta ve dış Hekimliğinde uzmanlık eğitim Yönetmeliği; 2022.
- Nadire E. Publication status of pharmacology specialty theses in scientific journals in Turkey. *J Surg Med.* 2020;4(7):507-10.
- Sarbay İ, Sarbay İ. Bibliometric spotlight on thoracic surgery specialization theses in Turkey. *Kardiochir Torakochirurgia Pol.* 2023;20(1):12-7. doi: 10.5114/kitp.2023.126093, PMID 37077467.
- Koca K, Ekinci S, Akpancar S, Gemci MH, Erşen Ö, Akyıldız F. An analysis of orthopaedic theses in Turkey: evidence levels and publication rates. *Acta Orthop Traumatol Turc.* 2016; 50(5): 562-6. doi: 10.1016/j.aott.2016.03.001, PMID 27839943.
- Cevik E, Karakus Yılmaz B, Acar YA, Dokur M. Systematic analysis of theses in the field of emergency medicine in Turkey. *Turk J Emerg Med.* 2015;15(1):28-32. doi: 10.5505/1304.7361.2014.37074, PMID 27331192.
- Yüksel M, İpekçi T, Tuñçkırın A. Publication rates of dissertations written in medical faculties of Turkey in the field of urology between the years 2008 and 2011 and citation analysis: A cross-sectional study. *Turk J Urol.* 2018;44(4):341-5. doi: 10.5152/tud.2017.32042, PMID 29799403.
- Akkeçeci NS. Publication of physiology theses in scientific journals: analysis of the status from Turkey. *J Surg Med.* 2019;3(3):235-8.
- Bornmann L, Williams R. Can the journal impact factor be used as a criterion for the selection of junior researchers? A large-scale empirical study based on ResearcherID data. *J Inform.* 2017;11(3):788-99.
- Orbay K, Miranda R, Orbay M. Invited article: building journal impact factor quartile into the assessment of academic performance: A case study. Part Educ Res. 2020;7(2):1-13. doi: 10.17275/per.20.26.7.2.
- Eze UA, Adebayo O, Nnodim IJ, Adejo AC, Obazenu LO. How to choose a Dissertation Topic. *Niger J Med.* 2021;30(2):123-4. doi: 10.4103/NJM.NJM_228_20.

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