Clinical Research Article

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Palpatory tests in manual therapies: an international survey on osteopathic clinical practice

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Abstract

Context: In osteopathic manipulative medicine, palpatory tests are used as a primary element for osteopathic assessment.
Objectives: The primary aim of the study is to explore the knowledge and use of palpatory tests in detecting somatic dysfunction, the second is to assess the knowledge about the inhibitory tests among osteopathic practitioners in Italy, England, and France.
Methods: A quantitative survey was conducted, between March and May 2021, through the administration of a semi-structured questionnaire. The participants had to answer 8 questions.
Results: 2,223 e-mails were sent: 423 manual therapy professionals participated in the survey. Subsequently, only the responses of the 385 osteopaths (280 Italian, 23 French and 82 British) were included in the data processing; the 38 excluded were physiotherapists and chiropractors. The most significative outcomes for the total sample were found to: years of working experience and knowledge of a palpatory test that allows to discriminate two dysfunctional anatomical structures was significant with a χ^2=12.509 (p-value <0.006); 68.5% answered in the affirmative to this last question. It was found that less work experience is associated with knowledge of a palpatory test to discriminate two dysfunctional structures. The correlation between years of work experience and knowledge of the inhibitory test was explored with the result being statistically significant (p value <0.001). 64.4% know and use the inhibitory test. 39.1% base the inhibitory test on tissue change.
Conclusions: The clinical practice of Italian and French professionals, makes possible to establish the hierarchy between two somatic dysfunctions with respect to English sample. The osteopaths reported a wider use of the tissue change parameters rather than pain reported by the patient. Furthermore, more than half of the sample-based their discriminatory test on the musculoskeletal and fascial systems. There is a vast knowledge of the inhibition test among osteopaths.

Keywords: inibitory test; manual therapy; osteopathic manipulative treatment; palpatory test.

Introduction

Osteopathy is defined by the World Health Organization as a primary contact healthcare profession that relies exclusively on manual contact for diagnosis, management, and treatment of patients of all ranges of ages [1]. In the American Association of Colleges of Osteopathic Medicine (AACOM) glossary, Osteopathic Manipulative Therapy is described as: "The preferred term for a complete system of medical care practiced by physicians with an unlimited license that is represented by a philosophy that combines the needs of the patient with the current practice of medicine, surgery and obstetrics. Emphasizes the interrelationship between structure and function, and has an appreciation of the body's ability to heal itself" [2].

The United Kingdom has introduced osteopathy as a paramedical discipline in 1993, which is regulated by the General Osteopathic Council (GOsC) [3], the body responsible for the recognition and regulation of the practice of osteopathy. France officially recognized osteopathy in 2002 with Law no. 303, Article 75, concerning the rights of the patient and the quality of the health system [4]. In Italy, on November 5, 2020, the Presidential Decree acknowledges the State-Region Agreement on the definition of the professional

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profile of the osteopath [5], provided for by Law no. 3 of 2018 [6], which officially recognizes this profession as healthcare.

Somatic dysfunction is listed in the International Classification of Diseases (ICD-10) [7] and referred to in the AACOM glossary as an "impaired or altered function of related components of the somatic (body framework) system: skeletal, arthrodial and myofascial structures, and their related vascular, lymphatic, and neural elements" [2]. In osteopathic practice, palpatory tests are considered a fundamental requirement for carrying out the clinical practice. To date, the study of palpatory tests is often questioned, many factors can influence and alter the perceptual abilities of the operator in manual therapy, such as operator's diagnostic-clinical skills and expectations, as well as variations in the way a test is performed [9]. During the assessment of somatic dysfunction, the osteopath uses TART palpatory parameters (Tenderness, Structural Asymmetry, Altered Range of Motion, and Tissue Texture Changes) to detect it [8] (Figure 1).

One of the TART parameters is pain and in a systematic review by Seffinger et al. (2004), it was shown that pain is the parameter that has the greatest diagnostic efficacy [9, 10]. However, in the study by Fjr (2006), although it is confirmed that pain tests are more reliable, these types of tests are not very effective on para-spinal soft tissues [11]. The study by Liebenson et al. (2013), emphasizes that it is important to first find valid measurement tools that allow verifying the effectiveness of palpation, to allow osteopathy to shift from art to science [12]. Numerous researches in the osteopathic field refer to a 2010 study by Degenhardt et al. which focused on the improvement of palpatory tests; the examiners were able to maintain and improve the inter-observer reliability of four lumbar diagnostic palpatory tests over 4 months [13, 14].

The scientific committee of the International Federation for Manual/Musculoskeletal Medicine heavily criticizes the results of the studies on the reliability of palpatory tests and suggests improving palpatory abilities with a training period before observations [15]. The role of palpatory tests within osteopathic manipulative treatment is a critical factor for correct clinical reasoning and subsequently for designing a therapeutic plan. The osteopath achieves this through tactile perception, but in clinical practice, touch is not the only sense used to reach a diagnosis. It is argued that osteopaths locate somatic dysfunction with most of their senses and not just one of them. The information that is conveyed by the different senses is processed and interpreted at the cerebral level, taking into account the anatomy-pathophysiological preparation of the osteopath [16].

This study aimed to investigate osteopaths' knowledge of palpatory tests and their use in clinical practice by conducting an international survey. The survey analyses whether palpatory tests are used in the osteopathic profession, which tests are used in their practice and on what rationale each test is based according to osteopaths. It was also investigated whether osteopaths are familiar with the inhibitory test and how they go about conducting it [17]. In clinical practice, the inhibition test, consists of pressure exerted by the osteopath's hands on dysfunctional anatomical areas, previously detected by osteopathic tests, to assess the correlation that these manual stimuli induce on a somatic dysfunction at a distance [18].

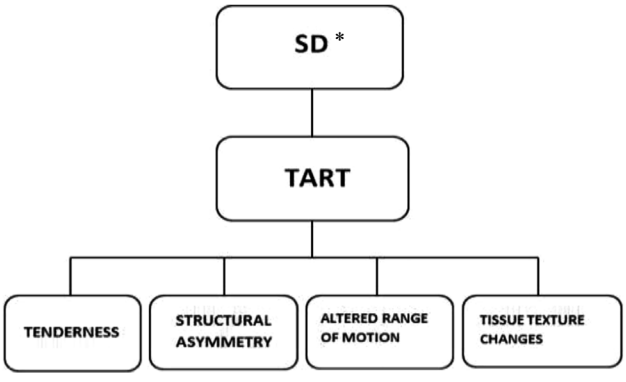

Figure 1: The process of locating somatic dysfunction using TART palpatory parameters.
*Somatic dysfunction.

Methods

A quantitative survey was conducted, between March and May 2021, through the administration of a semi-structured questionnaire. During this time frame, Osteopaths were recruited, emails were sent via Google Form (Google LLC, Mountain View, California, USA; https://docs.google.com/forms) and questionnaire responses were received and analyzed. To prevent multiple participation in the questionnaire, each respondent was asked to type in their email before submitting responses. The choice to use the Google form as a survey tool was made on the basis of: simplicity and clarity in the setting up of the survey by the researcher and the obtaining of already formatted content in XLSX, DOCX, PPT format for clear reference. In addition, this tool was chosen for the ease in completing the questionnaire by the respondent and thepossibility of being able to enter their email to avoid duplication of the result. A Consensus-Based Checklist for reporting of Survey Studies(CROSS) was used to analyse and describe some points of the article [19]. Professionals were recruited through the osteopathic professional registers of each country. After collecting e-mails from each register, 2,223 e-mails were sent to osteopathic professionals registered in the "Registre Des Ostéopathes de France (ROF)" to osteopathic professionals registered with the 'General Osteopathic Council (GOsC)' and to osteopathic practitioners registered in the 'Register of Osteopaths of Italy (ROI)': 423 manual therapy professionals participated in the survey. Subsequently, only the responses of the 385 osteopaths (280 Italian, 23 French and 82 British) were

included in the data processing; the 38 excluded were physiotherapists and chiropractors. The sampling techniques used for sample recruitment were convenience sampling as Osteopaths not adhering to their own reference registers in the country of origin, were not contacted through email. This type of recruitment was chosen to expedite and facilitate communication with Osteopaths. The only criterion for exclusion from the survey was not being included, through their email, in the register of the country of origin. The only criterion for inclusion was to be a member in their national registry and to have given in their registry the public email (Figure 2).

The survey was built and uploaded through Google Forms platform; before taking the questionnaire, the participants had to read and sign the consent form on data protection and online privacy, regulated by their country of origin. The participants who took part in the study were located in the following countries: Italy, England, and France. The examined sample was considered through the responses received automatically on the Google Form platform. In this survey, communication with respondents was exclusively through email and not through social networks or video conferencing programs, so that the data received could be accessed at any time. Particular attention was paid, during data collection, not to duplicate responses and to sample them through Microsoft Excel. The representative sample compared to the study population was 17.3%. That is, 385 Osteopaths were surveyed out of 2,223 Osteopaths contacted. The sample size is obtained from the responses that came in, particular attention was given to the protocols for obtaining the email of professionals from their membership records. The goodness of fit results obtained from the sample was given by a very large study population. The participant had to answer 8 questions: 4 multiple choice questions where more than one option could be selected, 3 multiple choice questions where only a single answer was permitted, and 1 with open-ended question.

The questions were as follows: (see Appendix A)

The answer "no" to question n° 3, redirected the participant directly to question 6; the answer "no" to question no. 6 led to the end of the questionnaire. Question 4 was an open question that allowed the participant to enter the name of the test he knew and/or used during clinical practice. To questions n. 1–5–7–8, participants had the possibility of answering with more options. Question 5 contained the following answers: Musculoskeletal system, Nervous system, Vascular-hormonal system, and Fascial system. Question 8 contained the following answers: patient-reported pain, perception of tissue change, both, or none.

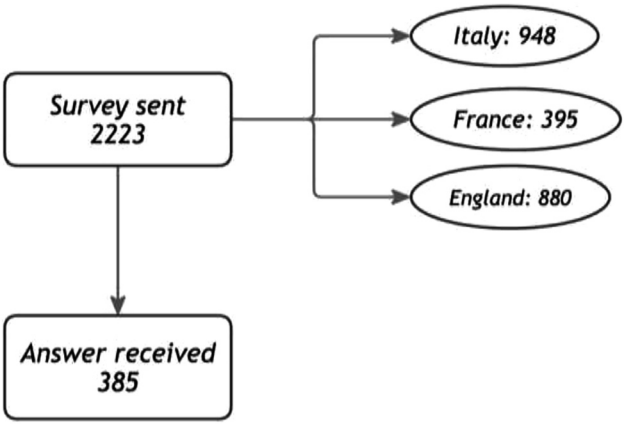

Figure 2: Number of survey sent, and answers received.

The possible limitations of the present survey were concerning the sample size (i.e., a disproportionate sample size among the various countries), culture (i.e., populations of different countries, and, therefore, of different cultures, can experience different outcomes following the same intervention or exposure), nature of the question (i.e., forced choice answer in closed questions), and communication (i.e., difficulty in understanding some of the questions).

The data obtained from the responses to the survey were grouped and subsequently analyzed with the statistical test Chi-square (χ^2) goodness of fit. Data processing showed little absolute significance with p-value less than 0.005.

Results

Descriptive analyses show that of the 385 professionals who participated the study, 40.3% had between 0 and 5 years of experience in the field, 31.7% between 6 and 15 years, 21% between 16 and 30 years, and 7% over 30 years. For the main analysis of the collected data, the statistical test of choice was a Chi-square goodness of fit. Results with a p-value <0.05 were evaluated as significant. The most significant results for the overall sample were as follows: for questions 2 and 3, with a χ^2=12.509 and an associated p-value <0.006. To question 3, 31.5% replied negatively and 68.5% answered affirmatively. To the open question 4, out of 195 respondents, 35% mentioned the inhibitory test, 12.8% the balance test, 5.6% the standing flexion test (STFT) and sitting flexion test (SIFT), The remaining 40% described their test with another name (Figure 3).

Question 5, a question where multiple answers were possible, was answered by 264 respondents with 433 answers. 30% of the responses endorsed the musculoskeletal system, 20% the nervous system, 7.5% the vascular-hormonal system, 37% the fascial system, and 5.5% other systems (Figure 4).

The dependency between questions 2 and 6 was explored and a χ^2 of 33.748 with a p<0.001 emerged. To

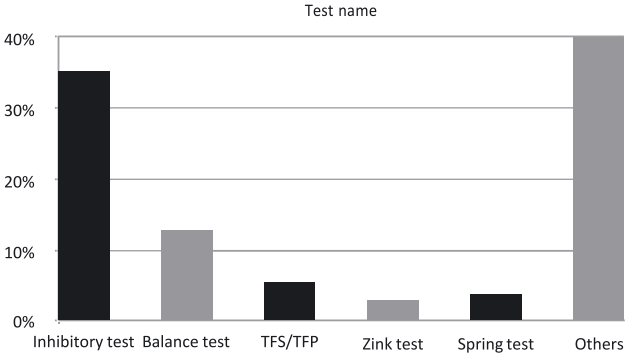

Figure 3: The name of the tests used in the total sample.

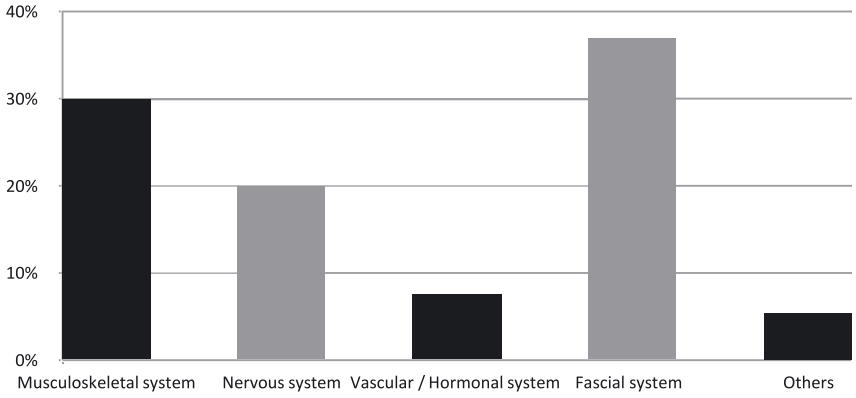

Figure 4: The physiological parameters on which the tests acts.

question 6, 23.6% of the respondents did not have knowledge of the inhibitory test; 64.4% (n=294) answered affirmatively and reported the correct use, and 11.9% reported knowledge but not use of it. . Exploring the dependency between questions 7 and 8, a χ^2 of 38.680 was found with a $p<0.001$. To these questions, 93.2% of the respondents replied that they had learned the inhibitory test in their training course, 5% from a colleague, and 9.5% in their personal study. Question 7 showed that 83.2% of the participants learned the inhibitoty test in their courses of study.

In question 8, 39.1% of the respondents chose to apply the inhibitory test where changes in tissue are detected, 5.8% where pain is reported by the patient, and 40.5% in both situations. The rest reported knowledge but did not report using it. The results are shown in Table 1.

The most significant results obtained in the Italian sample were the following. Question 3, 18.5% of the respondents answered negatively while 81.5% answered positively. Question 5, a question where multiple answers were possible, was answered by a total of 230 respondents with a total of 372 answers: 31% of the responses endorsed the musculoskeletal system, 20.5% the nervous system, 6.5% the vascular-hormonal system, 38.5% the fascial system, and 3.5% on other systems. In the cross-tabulation, questions 2 and 6 showed a dependency of χ^2=21,160, with a p value <0.002. In question 6, 9.3% of the answers did not show knowledge of the inhibitory test, 76.8% did, and 13.9% showed knowledge but not use of it. The dependence between questions 2 and 8 was found to be χ^2=34,591 with $p<0.001$. In question 8, 38.6% of the respondents chose to carry out the inhibitory test where changes in tissue are detected, 5.9% where pain is reported by the patient, and 41.3% in both situations. The rest reported knowledge but did not report using it (Table 2).

The most significant results obtained in the French sample were the following. Questions 2 and 3 had a dependency of χ^2=9,938 with associated p-value <0.019. To question 3, 17.5% of the respondents answered negatively and 82.5% answered positively. Question 5, a question

Table 1: In the table the answers to the questions of the questionnaire have been inserted, with respect to the sample: total. Working seniority (2). Knowledge of a palpation test that allows to discriminate two dysfunctional anatomical structures (3). The name of the test used (4). The physiological parameters on which the test acts (5). Knowledge of the inhibition test (6). In what context was the inhibition test learned (7). Which parameters are used for the use of the inhibition test.

Requests	2	3	4	5	6	7	8
Total sample	0–5: 40, 3%	Yes: 68.6%	Inhibitory test: 35%	Musculoskeletal system: 30%	Yes: 23.6%	Training course: 83.2%	Pain: 5.8%
	6–15: 31, 7%	No: 31.4%	Balance test: 12.8%	Nervous system: 20%	No: 64.4%	Colleague: 7.3%	Tissue change: 39.1%
	16–30: 21%		TFS/TFP: 5.6%	Vascular/hormonal system: 7.5%		Personal study: 9.5%	Both: 40.5%
	30+: 7%		Zink test: 3%	Fascial system: 37%			Not use it: 14.6%
			Spring test: 3.6%	Others: 5.5%			
			Others: 40%				

Table 2: The most relevant answers from each individual country have been included in the table. Knowledge of a palpation test that allows to discriminate two dysfunctional anatomical structures (3). The physiological parameters on which the test acts (5). Knowledge of the inhibitory test (6). Which parameters are used for the use of the inhibitory test (8).

Country	3	5	6	8
Italy	Yes: 81.5% No: 18.5%	Musculoskeletal system: 31% Nervous system: 20.5% Vascular/hormonal system: 6.5% Fascial system: 38.5% Others: 3.5%	Yes: 76.8% No: 9.3%	Pain: 5.9% Tissue change: 38.6% Both: 41.3% Not use it: 14.2%
France	Yes: 82.5% No: 17.5%	Musculoskeletal system: 24% Nervous system: 19.5% Vascular/hormonal system: 17.5% Fascial system: 37% Others: 2%	Yes: 78.3% No: 21.7%	Pain: 9.5% Tissue change: 38.1% Both: 33.3% Not use it: 19.1%
England	Yes: 19.5% No: 80.5%	Musculoskeletal system: 25% Nervous system: 6% Vascular/hormonal system: 6% Fascial system: 6% Others: 57%	Yes: 18.3% No: 81.7%	Pain: 9% Tissue change: 36% Both: 36% Not use it: 19%

where multiple answers were possible, was answered by a total of 19 respondents with a total of 46 answers. 24% of the responses endorsed the musculoskeletal system, 19.5% the nervous system, 17.5% the vascular-hormonal system, 37% the fascial system, and 2% other systems. In question 6, 21.7% of the respondents did not know the inhibitory test while 78.3% did. In question 8, 38.1% of the respondents chose to carry out the inhibitory test where changes in tissue are detected, 9.5% where pain is reported by the patient, and 33.3% in both situations. The rest reported knowledge but did not report using it.

The most significant results obtained in the English sample were as follows. In question 3, 80.5% of the respondents answered negatively and 19.5% answered positively. To question 6, 81.7% of the respondents did not know the inhibitory test while 18.3% did.

Discussion

The primary aim of the study is to explore the knowledge and use of palpatory tests in detecting somatic dysfunction, the second is to assess the knowledge about the inhibitory tests among osteopathic practitioners in Italy, England, and France [17, 20, 21].

The strength of this study is that it aims to seek a common language in the definition of a test that allows osteopaths to correlate two dysfunctional anatomical structures. Uniformity of nomenclature has always been a goal of the international osteopathic community, as it contributes to the credibility of the profession and to a common language between nations.

From the data on years of professional experience in the field of osteopathy, it emerged that the knowledge of the inhibitory test is negatively correlated to the years of experience. To date, the literature reports that it is not clear whether years of experience play a key role in the tactile perception ability of the manual therapist [10]. The data that emerged from our study are consistent with the study by Mueller et al. (2019), which also reported a negative correlation between tactile perception and years of experience [22]. From Kmita and Lucas (2008), it emerged that expert osteopaths, as compared to senior year osteopathic students, do not demonstrate greater reliability in the evaluation of PSIS (Posterior – Superior – Iliac – Spine) [23]. Several studies highlight the need of palpation training. In the study by Shaw et al. (2012), a palpatory examination, together with an ultrasound examination, was performed on the bone reference points of the dysfunctional vertebrae, and subsequently the correction technique was performed in HVLA [24]. Results obtained showed that the treated body side at the segmental level on the somatic dysfunction, had improved both at palpatory and ultrasound. Also, in other studies, operators used a new laryngeal palpatory rating scale (LMPTE) in patients with dysphonia, obtaining highly reliable results in the Cronbach's alpha ratio [25, 26]. From the present study it emerged that 40% of the responders that reported applying the inhibition test, oriented themselves following the parameters of tenderness and tissue change. However, as a limitation, it must be taken into account that

the answer options presented to the osteopaths were lacking in movement parameters, limited, and asymmetric. In the Licciardone and Kearns (2014) study, it emerged that the parameters most used by osteopaths in locating somatic dysfunction were pain and limited movement [27]. In a review conducted by Najm et al. (2003), the use of joint mobility and pain as parameters was reported to result in poor reliability of the diagnosis [28]. Future research is needed to clarify how all these parameters can contribute to locate somatic dysfunction. To date, reference models are used in which dysfunctional picture of patients is described. In the present study, when asked which test they used to establish the hierarchy of two somatic dysfunctions, 35% of the osteopaths reported using the inhibitory test to and most learned it in the course of their studies. At present, no literature is available regarding the use of this test in this situation. On the other hand, 5.6% reported using the standing flexion test (STFT) and sitting flexion test (SIFT) [20], 3% the Zink test [29–33], and 3.6% the Spring test [34]. It turns out that professionals justify the discrimination between two dysfunctions more with the musculoskeletal system and the fascial system. As a limitation of this survey, it is necessary to take into account the possible inaccuracy of the translation of the surveys, which may have led to the respondents misunderstanding question and giving an altered response. Another limitation is the lower adherence of French professionals compared to the Italian and English sample, constituting a possible Bias in the analyses of the responses. To overcome this limitation, the data have been separated and analyzed for each country separately. Data processing showed little absolute significance with p-value less than 0.005. In this study, all the data collected were obtained from the responses of osteopaths affiliated with their country's official register, bearing in mind that membership of such registers is not compulsory but voluntary. Possible limitations of this survey include: sample size (disproportionate between countries), culture (populations from different countries, and therefore different cultures, may have opposite experiences). Different countries, and therefore different cultures, may experience different results and outcomes following the same intervention or exposure. Other possible biases could be the nature of the question (forced-choice answers in closed questions) or communication (difficulty in understanding certain questions).

Through this survey, it has emerged which tests osteopaths really use in their clinical practice for the detection of somatic dysfunction, attributing to each of these tests a name and a system that justifies it. Future research will be important to classify and validate the osteopathic diagnostic tests in countries where osteopathy is used.

Conclusions

The results showed that in the clinical practice of Italian and French professionals, most use a discriminatory test between two dysfunctions. This showed that there are many tests used by the Italians and the French that allow the hierarchy between two somatic dysfunctions; in contrast to the results obtained from the British sample. It was also found that Italian and French osteopaths are familiar with and use the Inhibitory test, in contrast to the majority of British practitioners, who responded negatively to knowledge of this test. In the latest version of the Glossary of Osteopathic Terminology, this test does not appear, although this study shows that its knowledge is widespread among French and Italian osteopaths. There is a strong need for future research to clarify the importance of the tests that many osteopaths use in their clinical practice to understand which dysfunction is prevalent.

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Author contributions: Emanuele Novelli: Conceptualization, Investigation, Writing- original draft. Livio Molinari: Conceptualization, Investigation, Writing- original draft. Stefano Consolo: Data Analyst, Data curation, Formal Analysis. Luca Mingrone: Conceptualization, Investigation, Writing- original draft..

Competing interests: The authors declare that they have no conflict of interest.

Informed consent: Informed consent was obtained from all individuals included in this study, by means of the google form questionnaire.

Ethical approval: Not applicable.

Appendix A: Survey questions

- Work activity (1).
- Years of working experience (2).
- Knowledge of a palpation test that allows to discriminate two dysfunctional anatomical structures (3).
- The name of the test used (4).The physiological parameters on which the test acts (5).
- Knowledge of the inhibitory test (6).
- In what context was the inhibitory test learned (7).
- Which parameters are used for the use of the inhibitory test (8).

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