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# A cross-sectional analysis of the motivational factors that influence students of diverse backgrounds to study medicine-exploratory study

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# A cross-sectional analysis of the motivational factors that influence students of diverse backgrounds to study medicine-exploratory study

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## Abstract

### Background

Students apply to study medicine with intrinsic motives of genuine interest and sheer passion about the subject (intrinsic motivation) or external motives such as status, or family endorsement (controlled motivation). Pertinent to the motivation; intrinsic versus controlled motivation, students' adaptation to the course, performance and accomplishment may differ. This study was conducted in one of the UK medical schools, aiming at exploratory study to identify factors motivating students from diverse widening participating background WPS to study medicine in comparison with their counterpart International students (IS).

### Design

A quantitative cross-sectional questionnaire-based analysis.

### Setting

The study was conducted in one of the UK medical school, for obtaining the degree of Postgraduate Diploma Education for Health Professionals from University of Birmingham.

### Participants

A total of 69 students; 20 WPS and 49 IS were involved.

### Methods

Questionnaires were disseminated to students electronically addressing their demographics of age, gender and ethnicity; and analysing their motivating factors to study medicine.

### Results

Among the list of 6 motivating factors, "financial stability/employability" was the only one that showed:

1. a statistically significant difference ( $p < 0.05$ ) between the responses of the older students (median value= 3) and the younger students (median value= 2), Mann-Whitney  $U = 42.5$ .
2. and a statistically significant difference ( $p < 0.05$ ) between the responses of IS (mean value= 2.2) and WPS (mean value= 1.58)  $t(30) = 2.06$ . For all other

motivating factors, no statistically significant differences were observed among any of the studied groups.

### Discussions and Conclusions

When asked about motivating factors to study medicine, older and international medical students were significantly more motivated by "financial stability/ employability"; compared to the younger and WP students respectively.

## Introduction

### Background

There remains a substantial shortage of healthcare professionals across the continents. Historically, medical students have come predominantly from wealthy background (Steven et al. 2016). To widen the access to medicine from diverse social backgrounds, medical schools set up various Widening Participating WP entry programmes. According to Gorard and Smith (2007), WP in higher education is a term usually assigned to activities and interventions aimed at creating a higher education system that is inclusive of all, including students who might not otherwise consider higher education, or who may be discouraged by cultural, socioeconomic or institutional barriers.

Studies (Curtis et al. 2014; Garlick et al. 2008a, 2008b;) have shown that students from WP programmes who pass through the admission process successfully, perform as well as their counterpart who are admitted via the conventional direct entry route. According to these studies.

According to Goel et al. (2018) motivation is defined as the process that initiates, guides, and maintains goal-oriented behaviours. A strong predictor for performance of any student is the motivation or drive from within oneself (Kusurkar et al. 2011). Understanding motivation is therefore essential in medicine because a motivated individual is willing to deploy and keep up the effort to provide good-quality health services. Brissette and Howes, (2010) stated that motivation to study medicine strongly relates to the student's three basic psychological needs for

competence by providing challenge (Harter, 1978; White, 1963), autonomy by involving choice (Ryan and Deci, 2000), and relatedness of belongingness to medicine (Baumeister and Leary, 1995; Reis, 1994). These three needs when satisfied do enhance self-motivation and mental well-being in general. On the contrary when ignored, the self-motivation and well-being will be crippled. The satisfaction of these three basic psychological needs, has been highlighted as a predictor of individuals' optimal growth and development in various life sectors: healthcare, education (students), and sport (Deci and Ryan, 2008; Vansteenkiste et al. 2005).

Students enter medical study with a variety of motives. These could be stemming out from internal satisfaction in helping others, interest in sciences of human biology, amusement by intellectual challenges, all of which can be categorised as "intrinsic motivation;" (Ryan and Deci, 2000). On the other hand, motives could be externally controlled by factors such as interest of financial rewards, social status, or cohesion from parents, family, or peers which can be categorised as "controlled motivation" (Ryan and Deci, 2000; Vansteenkiste et al. 2006). These motivations are crucial in predicting how much effort student are intended to inject in their medical study (Price et al. 1994; Vaglum et al. 1999). For example, students studying because of genuine interest in the subject (intrinsic motivation) would exhibit different type of study behaviour as compared to students who are studying because of parental pressure or prestige (controlled motivation) (Deci and Ryan 1985; Ryan and Deci, 2000). Students may combine the two intrinsic and controlled motivations. This combination may result in a unique profile among students (Vansteenkiste et al. 2009). Studying motivation would provide rich observations on how they intersect with each other which could be a subject for another study.

#### **Theoretical conceptual framework:**

In 1977, Deci and Ryan, (1985) introduced the "Self-determination Theory" SDT that toppled the then dominant belief that the best way to encourage humans to perform tasks is to "reward their behaviour". The SDT can eloquently clarify the concept of various motivational factors. Deci and Ryan distinguished between two different types of motivation: intrinsic and extrinsic based on the origin of the motivation (Ryan, and Deci, 2000; Deci and Ryan, 2000). An individual can be intrinsically motivated for a goal in life hence "autonomous/self-determined" motivation; and extrinsically motivated when one engages with an

activity for an external reward/force hence "controlled" motivation. SDT introduced the taxonomy of "autonomous" versus "controlled" motivation (Vansteenkiste, 2004).

SDT proposes that extrinsic motivation can vary in its relative autonomy (Deci, Connell, and Ryan, 1989; Vallerand et al., 1997). For example, students who select to study medicine because of parents' endorsement and those who capture the value of medicine as a career are both extrinsically motivated. Both examples involve intentional career planning rather than enjoyment, yet the former example of extrinsic motivation entails control by external force, and the latter reflects some form of personal choice, hence they vary in their relative autonomy. In this manner extrinsic motives do not always refer to demotivating factor.

Compared to controlled motivation, literature shows that autonomous motivation results in enhanced deep learning (Ratelle et al, 2007; Grolnick and Ryan, 19987) elevated achievement (Boggiano et al. 1993; Soenens and Vansteenkiste, 2005), better well-being and decreased drop-out (Vallerand et al. 1997; Hardre and Reeve, 2003). Therefore, intrinsic motivation is the desired type of motivation that is essential to thrive throughout life (Csikszentmihalyi and Rathunde, 1993). Nurturing these inherited potentials requires supportive environment. Factoring this into designing medical courses would aid organisations to improving the educational outcomes.

#### **Aim of the study**

The aim of this study was to investigate the various motivational factors that underpin students' selection to study medicine.

This study was conducted at a medical school in the UK that offers a WP entry programme. 20 additional places were ring-fenced for local WP students (WPS) from disadvantaged socio-economic background applying to study medicine via the 2018 Widening Participation Students' entry route. The revenue generated from the fee-paying International Students (IS) is used to subsidise the study cost of small number of local WPS who successfully completed the school selection process. To achieve the correct finance, 49 IS and 20 WPS were admitted via the required 2018 school selection process resulting in this unique make-up of students in the 2018 cohort admission. This unique make-up of the study sample gave the justification to conduct this study on exploratory bases.

The study will produce a comparison of the prevalence

of the set of motivating factors to study medicine between the two study groups: the local WP students and the international students in their first year of the medical course. To my knowledge, no previous study has examined motivational factors to study medicine in a similar set up to this unique one.

For medical schools, the data around what motivates students to choose to study medicine is important to inform their selection process around admitting the right caliber students who are applying to medicine for the right motive reasons. There is some evidence (O'Neill et al. 2013; Stegers-Jager et al. 2015) that accurate selection of the right caliber students improves quality of patients' care later when they become graduates. The outcome of this research would provide schools with better understanding of the motives of students from different background to apply to medicine, in order to refine the admission process towards admitting the potentially good tomorrow's graduates. However, understandably more research is needed before consolidating the results into an effective recruitment measure.

#### Research questions:

The study aimed to answer the following questions:

1. what are the motivating factors that influence students to study medicine; and how are these motivations classified according to SDT: Intrinsic and controlled motivations?
2. Do these motivating factors differ for students of diverse backgrounds?

#### Research design

**Study's sample and setting:** All the first-year students of the medical course at a University in the UK were included in this study. The study was conducted mid-2019. The research questions were addressed by conducting a quantitative cross-sectional survey. Data was collected by mean of a structured questionnaire distributed to the respondents. It is expected that the retrospective responses of the students in their first year, recalling what has motivated them to study medicine, would be the closest to the admission time when motivating factors were prospectively inspiring them to apply to medicine. If the study was to run later-on the course, students' experiences would have changed their ranking of the motives compared to the start of first year.

#### Participants

A total of 69 students; 20 WPS and 49 IS were involved.

#### Methods

Questionnaire was disseminated to students electronically addressing their demographics including age, gender and ethnicity, and their motivating factors to study medicine.

#### Ethical Considerations

The School Ethical Approval Panel of Research in Medical Education was established after this study began. Before this panel came into existence, the School process of obtaining ethical approval was followed. This involved submitting, to the School Programme Executive Committee, the completed Ethics Form that was reviewed and approved by the taught Diploma Course ethical committee (Appendix 1). The Students' Information email with a link to the questionnaire (Appendix 2) was also submitted with the Ethics Form. To make sure that we complied with the rules laid down by the Declaration of Helsinki, the Students Information email included explanation that the participation in the study was voluntary, there was guarantee of confidentiality and anonymity and that nonparticipation would not cause them any adverse outcome. They could also choose to withdraw from the study at any time without giving any reason. In this manner, we satisfied ourselves that students gave informed consent upon completing the questionnaire.

#### The Questionnaire

A cross-sectional questionnaire provided a snapshot at a one point of time of the study's sample. Information with a link to the questionnaire, was sent electronically to students. The questionnaire was hosted on the internet-based data collection programme "Survey Monkey - [www.surveymonkey.com](http://www.surveymonkey.com) (Portland, Oregon, USA). The students' information email included the objective of the study, clear instructions for completion, and reassurance that data are stored safely and anonymously on a password protected university server. Consent was assumed upon the completion of the questionnaire. A named academic administrator was provided as a single point of contact for any query. Though being a school staff could influence responses in a way, this approach ensured the anonymity of the researcher mitigating a further level of bias resulting potentially from the researcher directly contacting the students. Two reminders were sent at a week interval to maximise the response rate. Based on the 69 total students' number and aiming for 50% response rate, 34 respondents were expected.

Crawford's book (1997)'s useful recommendations on developing the questions were followed- wording/phraseology was carefully selected

with no ambiguity to avoid pushing respondents towards one motive or another. The questionnaire was then tested running it by few colleagues per Fan and Yan (2010) systematic review. This allowed final refining of the questions reaching reasonable satisfaction that themes of motives are adequately and distinctively covered, aiming to gauge honest genuine responses.

### **Synthesizing the Questions (Q)**

The systematic review of Goel et al. (2018), gave the following numerous motives, grouped along their similarities under the following 6 main themes:

1) Altruistic motive, desire to help/work with people (Skatova and Ferguson. 2014; Wouters et al. 2017)

- Helping people and patients get healthier,
- Interest in people,
- Willingness to sacrifice,

2) Intellectual satisfaction with science and research opportunities (Girasek et al. 2011; McHarg et al. 2007)

- Balance between theoretical and practical learning,
- High school academic achievement,
- Scientific and research interest,

3) Curing and preventing disease, in community and globally (Heikkilä et al. 2015)

- A role in community health,
- A role in public/global health,
- Giving back to society,

1. Encouragement (or pressure) by family or friends, role model (Heikkilä et al. 2015; Pruthi et al. 2013; McHugh et al. 2011; Gyrfy et al. 2016)

- Friends/relatives studying medicine,
- Parents doctors themselves,
- Role model,

1. Financial stability and employability (Gyrfy et al. 2016)

- Greatly needed on the job market,
- Income,
- Stable job and safe career,

1. Social status/prestige (Skatova and Ferguson, 2014)

- Great social and professional status/respect,

- Globally recognised field,
- Reputation,

Based on the important paper of Wouters et al. (2017) the 6 main themes motivating factors were categorised along SDT to intrinsic (1,2,3) and extrinsic (4,5,6). These translated to the 6 questions (4-9) of the questionnaire (Table 1). The 3 intrinsic motives are mainly about a willingness to serving people, community and society. The 3 extrinsic motives are about materialistic rewards. These themes appeared to be balanced and distinct even when there is some overlap and above all supported by the literature quoted above.

The questionnaire (Appendix 2) contained 10 questions, first 3 corresponded to age, gender, and entry route. Question 4-9 corresponded the 6 motives to study medicine. Q10 was about ethnicity. After collating responses, the decision was made not to run analysis pertinent to ethnicity. This is because the international students came from 16 different background and thus one cannot run any meaningful analysis even if merging ethnicity into broader categories as the number will remain relatively small.

### **Data analysis**

Before starting the analysis, data cleaning was performed omitting any duplications or errors. There was no missing data for the SPSS to compensate. Data pulled together and presented in figures. Normality of data was tested by means of the D'Agostino-Pearson test  $p$ -values  $< 0.05$  indicating violations of normality). t-test compared between means and standard deviations with continuous data. Man-Whitney test was used when a violation of normality was found. By means of Ms Excel 2010 and GraphPad Prism (v.7), a series of statistical tests were performed looking for a statistically significant difference between responses of males and females, younger (17-20 years old) and older students (21-25 years old), and WPS and IS, to each 4-9 question corresponding to motivating factors 1-6.

For the t-test, the following two-tailed hypotheses were used:

- $H_0$  = there is no difference between the means of the two groups
- $H_1$  = there is a difference between the means of the two groups

For the Mann-Whitney test<sup>[1]</sup> two-tailed hypotheses were used:

- $H_0$  = the distributions of responses from both groups are identical
- $H_1$  = the distributions of responses from both groups are not identical

Correlations were explored using SPSS Statistics (IBM Corp. Released 2013. IBM SPSS Statistics for Windows, Version 25. Armonk, NY: IBM Corp). P-value < 0.05 utilised to show statistically significant differences between any two groups.

[1] The D'Agostino's K2 test is a goodness-of-fit test of normality of data. It is based on the observation of the sample kurtosis and skewness, testing the null hypothesis that the distribution of data is not skewed and/or kurtic.

2 The Mann-Whitney test, also called the Wilcoxon rank sum test, is a nonparametric test that compares two unpaired groups. To perform the Mann-Whitney test, values are first ranked from low to high, paying no attention to which group each value belongs. The smallest number gets a rank of 1. The largest number gets a rank of n, where n is the total number of values in the two groups. Values are then averaged in each group, and if the mean of the two ranks in the two groups are very different, the P value will be small. Medians are used to indicate the magnitude of the difference.

### Results (Table 2)

33 (18 males and 15 females) out of total 69 students responded resulting in a 48% response rate, thus the planned response rate target of 50% was closely achieved. 12 out of 20 (60%) WPS and 21 out of 49 (43%) IS responded.

A statistically significant difference ( $p < 0.05$ ) was found between the responses to Q8: "financial stability and employability" of the older students (median value = 3) and the younger students (median value=2), Mann-Whitney  $U=2.5$ . Therefore, the null hypothesis that the two groups have equal means was rejected concluding the older students were more motivated by financial incentives than the younger students.

Another statistically significant difference ( $p < 0.05$ ) was found between the responses to Q8 of IS (mean value=2.2) and WP students (mean value=1.58),  $t_{(30)} = 2.06$ . Therefore, the null hypothesis that the two groups have identical distributions was rejected

concluding the IS were more motivated by financial incentives than the WPS. In all other cases, no statistically significant differences were found including gender. Being male or female displayed no effect on the responses to any of the 6 motives (see p values in Table 2).

A correlation analysis carried out to investigate any relation between students' responses at Q4,5,6 (the intrinsic motives: altruistic motives to helping people, intellectual satisfaction, curing and preventing diseases), and at Q7,8,9 (the extrinsic motives: parental encouragement, financial stability and employability, prestige and status). Pearson's correlation coefficient was used (Table 3). The correlation coefficient, is a measure of effect size, expressed on a continuous scale rather than correlation/no correlation. A range between 0.350 and 0.500 indicates a moderate correlation (Weinberg and Abramowitz, 2002, p.136).

In terms of the intrinsic motives, moderate positive correlation (0.412) was observed between responses to Q4 "altruistic motives to helping people" and Q6 "curing and preventing diseases" which seems intuitive (hypothesis tested at  $\alpha=0.05$ ). In terms of the extrinsic motives, moderate positive correlation (0.352) was also observed between responses to Q8 "financial stability, and employability" and Q9 "prestige and status".

In terms of all the 6 motives, moderate negative correlation (-0.435) was found between Q6 "curing or preventing diseases" of the intrinsic motives and Q9 "prestige and status" of the extrinsic motives.

## Discussion

The summary findings of this exploratory study were:

1. The "older" and "International" students seemed to be more motivated by financial incentives than the "younger" and "WP" students respectively.
2. Among all intrinsic motives only one moderate positive correlation was found between responses to "altruistic motives to helping people" and "curing and preventing diseases".
3. Among all extrinsic motives only one moderate positive correlation was found between responses to "financial reasons, employability" and "prestige and status".
4. Among all 6 motives only one moderate negative correlation between "curing or preventing diseases" of the intrinsic and "prestige and

statusâ€™ of the extrinsic motives.â€™

A correlation can be either positive or negative. A positive correlation means an increase in scoring to one motive corresponds to an increase in scoring to the other motive.â€™ A negative correlation means an increase in scoring to one motive corresponds to a decrease in scoring to the other motive.â€™

The evidence fromâ€™ Berdudâ€™ et al.â€™ (2016) implies that doctors generally are intrinsically motivated to study medicine for altruistic desire to help people and community. But under the influence of some other â€™controllingâ€™ forces, the student may consider a course other than medicineâ€™ such as physiotherapyâ€™ that serves their altruistic motive but accepts part-time applicants. This would enable them to fulfil the duty of working while studying to earn living for their dependent family. Frenkâ€™ et al.â€™ (2010), referred to the complex interplay of the motivating and demotivating factors that influence the self-motivation choice.â€™ Extrinsic factors can be demotivating; e.g. the need to undergo complex selection processes (Wright, 2015), length of study (Southgate et al. 2015), workâ€™life balance (McHargâ€™ et al. 2007), negative media press (Harrison et al. 2003); discouragement by others (Freeman et al. 2016). Extrinsic factors can also be motivating such as â€™growing up in a family where parents are themselves doctors. This may be related to accessing work experience opportunities impacted positively on students wishing to study medicine (Greenhalgh et al. 2004). This may result in negative feelings that demotivate other students if they lack the network to access work experience (Freeman et al. 2016; Rao ad Flores, 2007). The power of autonomous motivation can be pivotal to overcome the demotivating forces and allow student to persevere.

Comparing globally, Goel et al. (2018) found in his systematic review that the main motives for students world-wide, were scientific (passion for research); societal (wealth and prestige); and humanitarian (serving the poor) in high income; in upper-middle income; and in lower-middle income countries respectively. Interestingly, their findings mirror Maslowâ€™s theory of hierarchy of needs (1943), This refers to motivation to satisfy the basic â€™deficient needsâ€™ of â€™helping peopleâ€™ at first level moving upwards in the hierarchy to satisfy the â€™growth needâ€™ of a â€™finance reward and employabilityâ€™ moving further upwards to satisfy the highest layer of â€™growth needâ€™ that is a â€™passion in researchâ€™ after becoming financially stable where money is not anymore a motive.

Being male or female displayed no effect on the responses to any of the 6 motives. This was somehow

surprising, since gender was found to be an important predictor in literature. Males showed higher extrinsic motivation than females. Females inâ€™ Kusrurkarâ€™ et al. (2010) study showed higher self-controlled motivation. The findings fromâ€™ Buddeberg-Fischer et al. (2003) were similar but the magnitude of the motivation differed. Boontarikaâ€™ andâ€™ Kuasakabeâ€™ (2013) found that motivation by family seems to positively correlate with female gender, a noted observation across different cultures according to Tanaka et al. (2009). A possible explanation may be females are closer to family than males and this remains true across culture.â€™

Interestingly, male students (McManus et al. 2006) of low socioeconomic status (Greenhalgh et al. 2004) displayed more extrinsic motives, compared to white female students who displayed more altruistic motives (G?sirowskiâ€™ et al. 2015;â€™ Gy?rffyâ€™ et al. 2016). Suggesting that gender, socioeconomic status, and perhaps ethnicity do influence these motives. However, no effect of gender was found in this study. Possible explanation would be the unique makeup of the studies students and the small sample number.

#### **Biasesâ€™**

It is important to keep an element of doubt on the accuracy of data collection and results. There is a risk that students may not give their real answers but those deemed politically correct. Realistically, early yearsâ€™ students are not widely aware of the â€™politically-correct answer gameâ€™. Equally, a surge of positivism risks adapting the face value of the results rather. The critical realism is to acknowledge our limited ability to know whether students gave really their honest answers. A degree of realism must remain accepting we will never be able to get into studentsâ€™ minds to ensure authentic findings.â€™

Another disadvantage of using questionnaires, is that students may interpret the questionsâ€™ information differently with no opportunity to clarify the misunderstanding, since all done electronically, resulting potentially in limited discovery. The NIHR Surveys and Questionnaires Revision, (2009) accepted that surveys can tell us â€™howâ€™ the study sample think in a certain way, but they do not tell us â€™whyâ€™ this is the case.

#### **Strength of the research designâ€™**

From start, the process of preparing the questionnaire involved combining the wide range of knowledge extracted from literature, and practice. Substantial thinking and consideration went into carefully designing the structured questionnaire. Piloting the questionnaire first with staff, seniors and juniors,

allowed useful discussions and amendments ensuring it is workable when involving students. In this manner the two processes of research and action were intertwined. Keeping the researcher anonymised, tends to allow participants to respond more authentically.

Running the survey at the start of year 1, would capture authentically what motivate students to consider medicine. That way there is an argument to run it even earlier: at A-level. Later, on the medical course, students' responses are likely to be influenced by their individual experiences in the medical school within the miso/exo/macrosystem as well as the microsystem: family, and community (Pfarrwaller et al. 2017).

These 6 questions are closed question to which students will answer "agree" or "disagree". The advantage is that they provide answers readily for a straightforward analysis. The disadvantage though, they suggest answers that students may not really considered. In contrast, open-ended question does give students opportunity to use their own words. The caveat is that students may not be able to articulate in writing their thinking.

#### Limitation of the study

There were three main limitations. First- relying on surveys' response rate, poses the question whether it is rigorous enough but just under 50% response rate is significant. The studied sample was small from the outset; hence this was exploratory study. Second- the key question remains about the generalisability of results, in that the magnitude of the correlation observed is limited to a small cohort and hence the probability of observing at least one significant result just due to chance- known as false positive or type 1 errors. Nevertheless, the correlations reported may be informative of the degree of association between the variables observed in this exploratory study. Future study could verify the results with a larger student sample. Additionally, the study sample was of a unique makeup of students of WPS and IS coming from different countries, races and ethnicity; hence again the inability to generalise. Results therefore, would not apply to wider range student population in other medical schools. Having said that the tests that were selected were correct and hence the analysis was correct. Social sciences generally look at soft output such as motivations hence the need for larger samples to make strong inferences. Third- the questions were synthesised along a carefully- thought process based on published literature and questionnaires that looked at the same research

questions. However, these very 6 synthesised questions were not validated in a previously validated questionnaire. Nevertheless, a substantial volume of literature over the last few decades (Deci and Ryan, 1985; Sicilina, 2009; Weinstein and Ryan, 2010; Makris and Siciliani, 2013) categorised the "helping people" and the "intellectual aspect of medicine" as intrinsic motivators; while the "financial rewards and employability" were considered extrinsic factors. This is identical to how the questions were categorised in this exploratory study.

#### Impact on research

This exploratory study recommends running the survey longitudinally in every academic year from year 1 to 5 to observe any accumulative effect of variables like age, gender, ethnicity and socio-economic class on motives for studying medicine over long period time with larger sample.

A study can be set up to investigate combining of high/low levels of intrinsic and controlled motivations, resulting in individual motivational profile of each student. This may correlate better with the performance outcomes of the individual students. This is because the individual students' motivational profile is likely to influence their academic performance Vansteenkiste et al. 2009; Ratelle et al. 2007.

#### Conclusion

In answering whether the motivating factors differ for students of different background, this study showed that the "financial stability and employability" theme tends to be less significant motivator for the younger students compared to the older ones. It appears that it is also less significant motivator for the WP students who came from diverse, less advantaged background, compared to the internationally students who came from diverse but perhaps more affluent background. This may imply that the younger students and the WP students were more inspired by the positive attitude of "autonomous intrinsic motivation".

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