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ACCELERATORS AND RESTRICTORS OF MADE-IN-CHINA COVID-19 VACCINE ACCEPTANCY

Abstract

This study is aimed to investigate the COVID-19 vaccine acceptancy among public, along with measuring the underlining role played by the made-in-china perception and vaccination effectiveness towards vaccination acceptance. It undertakes corona fear as a potential moderator to accelerate vaccine acceptance. Moreover, it highlights the impact of different demographic variables, including age, gender, and education on the perception towards the vaccine acceptance. A cross-sectional study was conducted that relied upon convenient and purposive sampling. Data was collected through online survey method predominantly in top-tier cities of Pakistan during the initial vaccination phase. The data was analyzed through 2-stage approach by employing Structural Equation Modeling in smart PLS 3.0. Importance Performance

Map Analysis was performed to analyses the impact posed by demographic factors over the vaccine acceptance. The results confirm the validity and reliability of data that was evaluated through VIF scores, HTMT ratio, CR, Cronbach's alpha, and AVE. The outcomes indicate that vaccine effectiveness and made in china perception significantly affect the vaccination acceptance whereas, corona fear accelerates vaccination acceptance. The study contributes to the current literature stream by bridging the gap between made-in-china perception and vaccine acceptance. It provides new research dilemma to study the role of demographics in depth. Consequently, the study provides a guideline for policy makers to formulate awareness strategies to neglect the negative perception and convince people towards getting vaccinated.

Keywords: *Vaccination; Made-in-China; Vaccine acceptancy, Covid-19, Pakistan*

Introduction

The year 2019 ended with an unprecedented surprise of novel virus COVID-19 that hit the globe with extreme affects, infecting the million and causing the death of thousands (Sherman et al., 2020). The pandemic wedged all countries across the world; compelling countries to adopt a new normal by implementing different strategies i.e. lock down, social distancing, and improving hygiene habits to avoid the viral infection (Wang et al., 2020). Similarly, Pakistan observed first case of COVID-19 on 26th February 2020, the virus spread rapidly infecting the 672,931 individuals and causing the death of 14,530 till date (World meters, April 1st, 2021). Government has taken different initiatives to control the disease i.e. spreading information, motivating nation to adapt the strategies to avoid the infection. A complete lock-down was also implemented in country during the first wave of corona but to get back to new normal these strategies are not enough. Health specialists, scientists and different health organization started working to find out the solution of virus that's vaccination (Raza, Qazi, Khan, & Salam, 2021; Sallam, 2021). Since then, countries across the globe are working faster than ever to develop vaccine (Palm, Bolsen, & Kingsland, 2021; Sherman et al., 2020). Till date March 31st there are 84 COVID-19 vaccination undergoing the clinical trials in 184 different countries (Gavi, March 31st, 2021).

China is one of the countries working on development of vaccine. First vaccine developed by Sinovac is in fourth phase of trial by February 2021. Another vaccine named BBIBP is developed by Beijing institute is also in trial phase (Gavi, March 31st, 2021). Pakistan has imported first batch of CanSino vaccine from China. In Pakistan the vaccination was initiated by health care worker and Government has started the registration of people over age 60 in March for vaccination (Xinhua, March 31st, 2021). Honorable Prime minister Pakistan also got vaccinated by Sinopharm vaccine imported from china. Unfortunately, two days after getting vaccinated Prime Minister Imran Khan was diagnosed positive for COVID-19 which provoked public concern about vaccination (Hussnain & George, March 21st, 2021). Moreover, generally in Pakistan the Made-in-China have negative image (Hui & Marin, 2017). In Pakistan normally the quality of made-in – China products are considered poor. Made-in – country perception involves different aspects based on shred country stereotype (Motsi & Park, 2020). Similarly, Pakistani public has shown concern about Sinopharm vaccine. According to the Dawn news report health care workers were in favor of Pfizer or AstraZeneca over the Sinopharm shot. "Some 58pc said a vaccine developed quickly could not be guaranteed to be safe. However, the effectiveness determines acceptance, even though made it china may be perceived negative, but the level of effectiveness can alter the attitude of individuals towards vaccination."

In Pakistan, the Government is recommending Chinese vaccine but even health care workers are also not satisfied with Chinese vaccine and are not willing to go for Sinopharm vaccine (The Dawn,21st March). The degree of hesitancy is high in Pakistan for Sinopharm vaccine not only in public but majority of the health care workers. Simultaneously, corona fear is very high among public and they want to get vaccinate to avoid infection (Raza, Qazi, Khan, & Salam, 2020). Keeping in view these concerns this study aims to measure the public acceptance of COVID-19 vaccine acceptance among public and understand the made-in-china perception role in acceptance of corona virus vaccination. Alongside, current study measures the impact of different demographic variables, including age, gender, and education on the perception towards made in china label and the vaccine acceptance.

Literature Review and Hypotheses Development

This paper deploys a model to study the impact of made in china perception and vaccine effectiveness on vaccine acceptance with the moderating role of corona fear. Moreover, it highlights the influence that is exerted by stratification variables including age, gender, and education. Made in china perception derives from the cost advantage that Chinese achieved in 21st century through trade of both high quality and worst quality products. Although the perception is changing but a negative perception exists as Chinese products are found to be the cheap and low-quality counterfeits of western products (Lew & Sulaiman, 2014; Singh, 2021; Toccaceli Blasi, 2020; Xu Chen, 2019). Similar is the case with vaccination acceptancy where the stereotype of inferior product still exists. The literature argues that willingness to get vaccinated depends upon the effectiveness of the vaccine, however the different vaccines available against COVID-19 are not 100 percent effective (Harapan et al., 2020; Sherman et al., 2020). Even before the global COVID-19 pandemic vaccines acceptability was based upon the level of effectiveness including vaccinations available against typhoid (Blum et al., 2014), polio virus (Bandyopadhyay, Garon, Seib, & Orenstein, 2015), HIV (Newman et al., 2006), MMR (Fazekas, Brewer, & Smith, 2008; Sharma, Akhtar, Singh, & Mehra, 2020), tetanus (Kajungu, Muhoozi, Stark, Weibel, & Sturkenboom, 2020), and other infectious diseases. After the emergency created by SARS-Cov-2, the vaccine took more than a year, meanwhile the fear of getting infected has boosted. Rare cases have been observed where individuals even conducted suicide or passed through the phases of suicidal ideation; predominantly in India (Dhrisya et al., 2020; Rana, 2020). Otherwise cases of stress and depression as well as anxiety were highly reported (Sahu et al., 2021). Fear is regarded as a force that arouses emotions and energy to face any adverse situation. In relation to corona virus the fear has developed phobias due to sudden panic created by corona pandemic (Metwally et al., 2020). Studies have discussed the auspicious and courageous role of front liners to fight against the infectious disease (Hasan & Nead, 2020). However, the current study belief that the corona fear can stipulate the vaccination acceptance and will catalyze the relationship

between made in china perception and vaccination acceptance. Stratification variables including age, gender, and education level is observed to have different impacts towards the made in china perception and the vaccination acceptance (Harapan et al., 2020; Huang et al., 2018). Therefore, the current study postulates a set of hypotheses, envisioned to identify the different catalysts that accelerates the vaccination acceptancy principally in context of Pakistan.

MADE-IN-CHINA PERCEPTION AND VACCINATION ACCEPTANCE

The label "made in china" is a perception that impacts the cognitive effective processing, prior research infer that it acts as a cue that overrides both an individual actions and attitudes (Bartikowski, Fastoso, & Gierl, 2019). With respect to vaccine acceptancy (Huang et al., 2018) distinguished between domestic and international acceptance determining that majority population have unclear preferences. Most recently (Schwarzinger, Watson, Arwidson, Alla, & Luchini, 2021a) argued that made in china perception rendered lower resistance to corona vaccine as compared to made in EU. However, label does not count with respect to meeting the requirements of international standard. Either the vaccine is made in china or imported to china, if it effective than it is accepted (Yu et al., 2020). Irrespective, the vaccine acceptancy in particular Pakistan is another dilemma. Pakistani public perceives chines products as sub-standard, therefore this perception cause resistance towards vaccine acceptance. There are discrepancies in acceptance of china manufactured vaccine, the effectiveness is still in queasy situation (Singh, 2021). Therefore, the current study hypothesizes the negative impact of made in china perception on the vaccine acceptance.

H_1: Made in china perception is negatively related to vaccine acceptance.

Perceived vaccination effectiveness and vaccination acceptance

Perceived vaccination effectiveness is the reduction of disease in vaccinated people with comparison to unvaccinated group. With respect to COVID-19 vaccines available there are different rates of effectiveness based upon companies and countries of origin. This has urged the majority to form negative perceptions about vaccine effective thus leading to acceptance. People have become hesitant to get vaccinated against the zoonotic virus (Huang et al., 2018; Palm et al., 2021). Alongside an Indonesian study confirmed that the percent of effectiveness directly impact the percentage of people ready to get vaccinated, hence providing a statistic that higher the effectiveness greater will be acceptancy (Harapan et al., 2020). Therefore, negative perception about effectiveness may be difficult for the population to accept it. We intend to study the nature of this relationship existent in, particularly Pakistan.

H_2: Perceived vaccination effectiveness is positively related to vaccination acceptance.

Corona fear and vaccination acceptance

The epidemics and pandemics are emotionally laden that may affect the mental wellbeing of people similar is that case with COVID-19 that has outrage anxiety and fear (Vasudevan & Alathur, 2020). The fear of corona virus prevails across the world, it have been observed that fear can be more harmful than the acute respiratory infection (Ren, Gao, & Chen, 2020). The sudden change in living environment can affect people psychologically, individuals feel unsafe, worried and uncomfortable (Amin, 2020; Shigemura, Ursano, Morganstein, Kurosawa, & Benedek, 2020). The fear to get infected by COVID-19 acts as a catalyst to accept getting vaccinated, as vaccination may prevent the adverse outcomes. (Amin, 2020) identified that the fear of corona is more contagious as compared to the virus itself particularly in Pakistani society. The surge of fear and anxiety caused by corona virus can be deemed positive, as this fear

will let people to get vaccinated and this is possible through proper awareness. Literature also emphasizes on the extreme fear of the virus that is connected to not availability of vaccine (Rana, 2020). Therefore, the current study intends to determine the impact of corona fear on vaccination acceptance.

H_3: Corona fear is positively related to vaccination acceptance.

Corona fear as a moderator

Fear is defined as a modifying sentiment that activates energy among people to contract with a probable hazard (Asmundson & Taylor, 2020). Literature revealed that unexpected circumstances and outbreaks such as that of corona virus can cause fear among people (Pakpour & Griffiths, 2020). (Raza et al., 2021) suggested corona fear as a potential moderator, whilst determining that the fear can bumper LMS and online studying acceptance among Pakistani students. The psychological impact of COVID-19 is prevalent in the society and it can buffer the relationship between made in china perception and vaccination acceptance. This stipulates the need to study the moderating role of corona fear therefore, we construct the following hypothesis.

H_4: Corona fear moderates the relationship between made in china perception and vaccination acceptance.

Impact of demographic variables

According to prior literature, vaccine acceptance and hesitancy is influenced by different demographic factors including age, gender, education, and income level etc. (Edwards, Biddle, Gray, & Sollis, 2021; Painter et al., 2021). Differences in acceptability are observed based on the demographic characteristics of social group (Bonanni, 1999). (Schwarzinger, Watson, Arwidson, Alla, & Luchini, 2021b) in their study identified the role of stratification variables including age, gender, education, and household size, concluding that different

groups hold different perception about vaccination effectiveness. Moreover, made in china label is perceived differently by dissimilar age groups, and most importantly education do count to eliminate such ambiguous discernments. Thus, to study the impact of these variables a larger population is divided into homogeneous strata's such as age, gender, and education. The study, therefore, intends to measure the impact of age, gender, and education on made in china perception and the outcome variable of vaccine acceptancy.

H5: Age, gender and education impacts the vaccination acceptance.

CONCEPTUAL FRAMEWORK
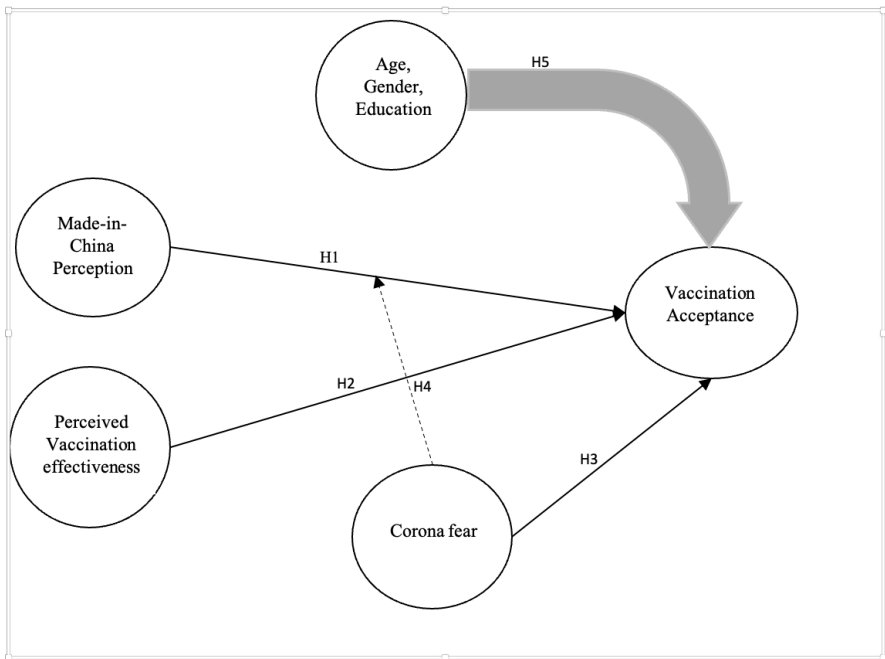
Methodology

The aim of this research is to check the individual's response towards COVID-19 vaccination. Along with other contributing factors the role of made-in-China stereotype is examined to measure the people intention towards vaccination. To achieve the objective a cross-sectional study was conducted during the vaccination phase in Pakistan. Data was collected through online survey (as due to partial lockdown in different parts of countries it was difficult to collect the physical hands-on data) using the convenient and purposive sampling.

A deductive approach was used to test the hypothesized model. A pre-developed scale was adopted from previous studies. Data was collected from first tire cities of Pakistan and Structural Equation Modeling (SEM) was applied using Smart PLS3 to test the hypotheses. Initially, a mass distribution of questionnaire was done throughout the country and more than 600 responses were collected. In second and third round almost 1100 responses were collected. After initial screening and data cleaning a total of 983 responses were used for hypotheses testing.

Data Analysis

This study employs the different data analysis techniques before testing the hypotheses. A total of 983 respondents fills out the questionnaires. Data was collected on convenient basis through online survey form. Respondents who fill the form are 43% were male and 57% were female. Most of them belong to age group 46-55 i.e.is 39%, 22% were above 55, 21% belongs to age group 36-45. Other respondents were from age group 26-35 (112%00 and beloww25 were 11%.

Educational level of respondent shows that mostly respondents were educated. Only 6% were less educated having basic education only. 17% were having intermediate degree, 25% of respondents were having under gradation degree. Whereas 23% were master's degree holders and 29% were having other diplomas degree and 1% have not specified their degree.

Before conducting the actual model analysis full collinearity analysis was conducted to check the biasness in the data. All the variables were regressed against a common variable and the VIF was calculated, if the VIF $\leq$ 5 then there is no bias from the single-source data. The results reported VIF below 5 indicating that single-source bias is not an issue of concern hence, the data was further analyzed. Further the results were analyzed by applying the Structural Equation Modeling (SEM) technique and two step approach was used. In first step model validity and reliability was confirmed as suggested by (Hair et el., 2015). In second step hypotheses were tested by applying the bootstrapping technique.

Measurement Model Analysis

Measurement model analysis applied to establish the reliability (internal consistency of data) and validity (accuracy of data). Cronbach's Alpha, Composite reliability > 0.7, and outer loadings >0.5 are used to test the reliability analysis (Hair, Risher, Sarstedt, & Ringle, 2019). Average variance extracted (AVE) is measure of convergent validity and AVE>0.5 is acceptable. Whereas to establish the discriminant validity instead of traditional Fornell-Larcker criterion Heterotriat-Monotrait ratio of correlations (HTMT) is recommended (HTMT<0.85) (Hair et al., 2019). The results of present study are in acceptable range as shown in Table 1 given below.

Table 1. *Measurement model analysis*

	CF	MDC	PVE	VA	Cronbach's Alpha	CR	(AVE)
CF1	0.711				0.909	0.929	0.726
CF2	0.875						
CF3	0.858						
CF4	0.909						
CF5	0.893						

|					
MDC1	0.888		0.877	0.924	0.803
MDC2	0.901				
MDC3	0.899				
PVE		0.670	0.638	0.769	0.630
PVS		0.901			
VA1		0.773	0.919	0.934	0.638
VA2		0.728			
VA3		0.817			
VA4		0.844			
VA5		0.854			
VA6		0.796			
VA7		0.774			
VA8		0.797			

STRUCTURAL MODEL ANALYSIS

Structural Model analysis was conducted to test the hypotheses by applying the bootstrapping technique. A 1500 sub-sample bootstrap was run to test the hypothesized relations. Results indicate the value of coefficient of determination (R^2) is 0.22. Which shows that overall change in model is 22% due to all constructs. Further, along with beta coefficient, t-value, and p-value f – square, lower limit confidence interval and upper limit confidence interval is used to accept the hypotheses. The outcomes of present study are given in Table 2 given below. Results indicate that corona fear significantly impact on vaccination acceptance as (B=0.060, T= 2.079, p=0.019). Made-in-china have significant negative impact on vaccination acceptance (B= – 0.040, T= 13.477, p=0.000). Perceived vaccination effectiveness significantly influences the vaccination acceptance (B= 0.062, T= 1.985, p=0.024). Further, moderating effect of corona fear indicates that negative relation between made-in-china and vaccination acceptance is weakened (B= 0.115, T= 3.929, p=0.000) as corona fear play buffering role.

Table 2. *Structural Model Analysis*

Hypotheses	Beta	T	p	f²	5.00%	95.00%
Age – > VA	0.01	0.334	0.369	0	-0.058	0.037
CF – > VA	0.060	2.079	0.019	0.004	-0.128	-0.009
Edu-> VA	-0.004	0.154	0.439	0	-0.036	0.048
Gender-> VA	-0.032	1.135	0.128	0.001	-0.008	0.054
MDC – > VA	-0.414	13.447	0.000	0.207	0.305	0.305
Made in China*CF – > VA	0.115	3.929	0.000	0.021	0.046	0.024
PVE – > VA	0.062	1.985	0.024	0.005	0.029	0.036

IMPORTANCE PERFORMANCE MAP ANALYSIS

IPMA is called importance-performance matrix "impact-performance map, and priority map analysis" (Ringle & Sarstedt, 2016, p. 1866). It was first introduced by Martilla & James (1977). It examines the performance of an constructs along with its importance in anticipating outcome variable. This test applies the identification of (unstandardized) total effect of indicator constructs importance in anticipating specific target construct (vaccination acceptance) (Hair et al., 2016, p. 276; Hair et al., 2018, p. 105). Importance of apparent variable is demonstrated by total effect, whereas mean value reflects their performance (Höck et al., 2010, p. 201). The criteria to run IPMA is that (a) all indicators should have one orientation and (b) outer weights should not be negative. With bootstrapping with 1500 subsamples and meeting all the requirements for running the IPMA, results of IPMA are finally discussed. The map results show that Made-in-china perception is most important factor for vaccination acceptance. Which is negatively associated with vaccination acceptance which means that marketers, doctors, strategists should focus on decreasing this negative perception about made-in-china to increase the vaccination acceptance. Second important factor in vaccination acceptance is corona fear.

Figure 1. *Importance-Performance Map Analysis*
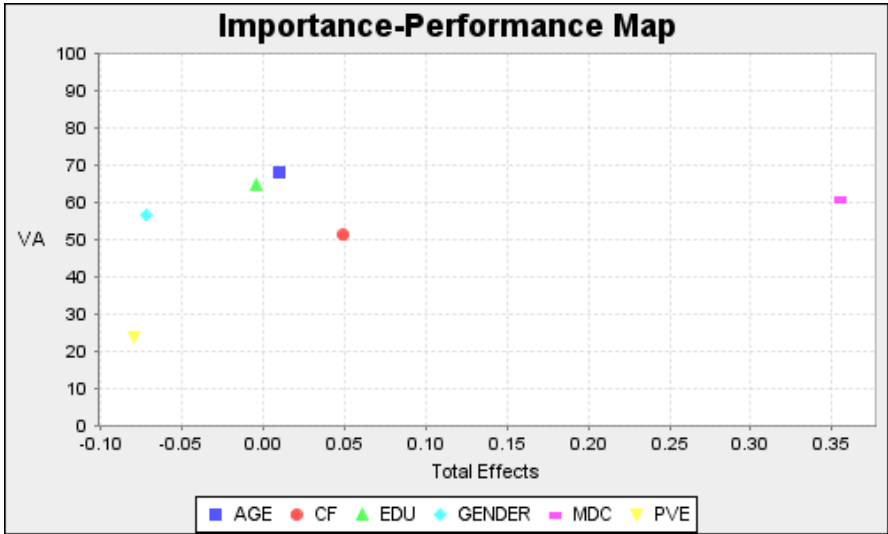
Whereas age and education also important factor in contributing the vaccination acceptance.

Discussion

This research intends to measure the individual acceptance of COVID-19 vaccination in Pakistan and role of Made-in-China perception on vaccination acceptance. To achieve the research objectives data was collected from the major cities of Pakistan through online medium. The result of study indicate that corona fear and vaccination acceptance significantly influence the vaccination acceptance. Further the model basically tested to check the role of made in china perception on vaccination acceptance. As literature suggest that made in china perception is negative which negatively influence the vaccination acceptance (Schwarzinger et al., 2021a; Yu et al., 2020). Present research proves this relationship significant which indicates that in Pakistani public have negative perception about Chinese vaccination and it will lower the acceptance rate. Whereas at the same time corona fear factor is very high.

Especially, during the third wave of COVID-19 in Pakistan the high transmission rate of virus creating fear and panic in public. This fear may lead to weaken the made-in-china perception. Present study measures this relation and proves that corona fear not only have direct impact on vaccination acceptance it also buffer the negative role between made in china perception and vaccination acceptance (Raza et al., 2021). All these outcomes of this study are aligned with previous work. Prior, researchers have measured the socio-demographic impact on vaccination acceptance in different countries and shown that different age group and education level show different attitude on vaccination acceptance (Schwarzinger et al., 2021b). However, in this study overall impact of age, gender and education was not found significant which may be due to initial vaccination phase followed by lack of awareness and negative expression towards made-in-china products.

Moreover, importance-performance map analysis was conducted to check the importance of all indicators in vaccination acceptance. Results shows that made-in-china is most important predictor of vaccination acceptance. Second important factor in vaccination acceptance is corona fear followed by age, education, and gender. Generally, in made in China perception is negative in different countries including Pakistan. Some believes are intuitive and spread faster scientific beliefs; as country-of-origin perception is a strong old belief negatively effecting the safety perception leading to lower acceptance rate (Salali & Uysal, 2020). In conclusion future campaign need to neutralize the negative perception of country (china) of origin; as some previous scholars have also that same country of origin of virus and vaccine may negatively associated with vaccinee acceptance (Salali & Uysal, 2020).

Conclusion

COVID-19 virus is a major health crisis across the globe during the present time. Current situations need a solution to deal present health crises. Vaccination is best solution to deal with COVID-19. Different countries including Pakistan started a step wise vaccination process of country's nationals. Vaccination is one of major point of concern in current point in time. Individuals need proper guidance of vaccination process and along with it trust, safety perception and effectiveness of vaccination are major issues to be handled. This study stabs to figure out the role of a stereotypical belief about made-in-china vaccination and its acceptance in country. The study proves that negative perception about country of origin negatively influence the vaccination acceptance. This negative perception should be focused on vaccination campaign. Moreover, study results revealed that perceived vaccination effectiveness significantly influence the acceptance. Therefore, it is important to build appositive perception of vaccination through campaign, a clear and source full communication is needed from government about vaccination effectiveness and need to discuss the level of its effectiveness, success rate to minimize the negative influence of made in china perception.

Fear also neutralizes the negative effect of made in china on acceptance of vaccine. Fear is a negative feeling, and it may also have other negative impact on human health. So, it is not recommended to create fear or panic about corona to increase acceptance but it is important to create awareness about the severity of current situation to avoid the future worse circumstances. During ongoing pandemic public health are confronted with difficult situation which provide an opportunity to create the awareness about not only covid-19 vaccination but as well as to bolster overall immunization programs for all vaccine-preventable diseases.

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