

Research Article

Factor Structure of the Updated Illinois Rape Myth Acceptance Scale in the Indian Context

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Abstract

This study explores the factor structure and the other psychometric properties of the updated Illinois Rape Myth Acceptance Scale (IRMAS), in the Indian context. The sample was collected from 429 college and university students in the state of Tripura in India. All the items in the original scale were retained and five major factors were revealed by Principal Component Analysis. The model was deemed to be a good fit by the estimates of Confirmatory Factor Analysis. All the five factors derived were found to be reliable. The divergent validity of the study was verified; however, the convergent validity was ascribed from the high composite reliability of the factors. Different other measures like item-total, inter-item correlation strengthened the foundation of reliability and validity of the scale. The full scale was found to possess satisfactory reliability. The gender difference in the total test scores was assessed and found to be significant. The other details are discussed herein.

Keywords: Illinois Rape Myth Acceptance Scale; psychometry; factor structure.

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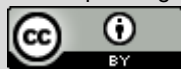
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Rape is one of the global crimes that occur every day, affecting billions of women, and is almost unchecked. The rape statistics are alarming all over the world. Though institutions like the UN have been fighting to curb rape, sexual harassment, trafficking, and other violence against women, the extent of success is not significant. Even worse, the victims are not found to be varying within a fixed range of age, as it was a few decades ago. Adolescents and children are increasingly subjected to these heinous crimes (Olusola & Ogunlusi, 2020). Also, there are numerous reports of people in their late adulthood and old age being the victims of rape (Chopin & Beauregard, 2020). These unusual victimizations call for global attention and there is an urgent need for us to come up with effective measures to curb the crime.

Of the various factors that fuel the crimes against women and/or prevents women from having their fundamental rights and freedoms is the unique concept of "rape myths". The concept of Rape Myth is not an old one since Martha Burt coined the term in the 1980s, which coincided with second-wave feminism. Burt (1980) defined the term in an article titled 'Cultural Myths and Supports for Rape'. According to her, rape myths work as a way out of the perpetrations; it serves as a scapegoat which gradually decriminalizes sexual assault or abuse and spares the perpetrator. Rape Myths are the beliefs that normalize the rape of women, reduces the perceived coercion and assault on women, and tends to displace the blame of what has transpired on the victim herself. In her words, rape myths produce false beliefs about rape, rape victim, and rapists. Again, Lonsway and Fitzgerald (1994) stated that these are the wrong attitudes that justify sexual aggression in men, directed towards women. Some examples of rape myths that plague our modern society are: i) Women who get into physical relationships with several men deserve to be raped, ii) There is nothing wrong in raping women who are into prostitution, iii) Women wearing revealing dresses should be raped or molested, iv) It is not rape, if there was no ejaculation by the man.



While discussing rape myth, [Payne et al. \(1999\)](#) gave a disclaimer in their study that they shall solely focus on female victimization. They did not deny that there are instances where women are the perpetrators and men are in the receiving end of the assault, however, since "the overwhelming majority of adult rape victims are female" ([Payne et al., 1999](#), p.3; [Poppen & Segal, 1988](#)), they decided to focus on male violence against women. In this present study, the same notion has been adopted, and rape myth shall be defined and considered from the same perspective (men as perpetrators).

Rape and Rape Myths in India

Though South Africa tops the list of nations having the highest rankings in rape ([Naidoo, 2013](#)), India's position is not very pleasant. According to the [World Population Review \(2019\)](#) data, the number of rape cases in India is 22,172 per 100,000 citizens. There was an average of 87 rape cases every day in 2019. Additionally, there are thousands of new child rape cases being recorded every year in India. The prevailing legal system has been proved quite ineffective in curbing this fast-growing rate of sexual abuse cases. The Nirbhaya case in 2012, the rape of Dr. Reddy in 2019, and lately the rape of a Dalit woman in the state of Uttar Pradesh are the incidences that should act as an eye-opener in the legal, cultural, and educational sectors in India. And these are the sectors which should be persuaded to promote the safety of women. There are long-standing rigid rape myths that makes this society not so safe for women. Moreover, these myths are held by men and women equally in society. More research works should be taken place to break these myths and stereotypes to come up with new, effective strategies.

The updated IRMAS scale

The original IRMAS scale ([Payne et al., 1999](#)) is psychometrically strong and it is considered one of the pioneers in assessing rape myth acceptance. It has seven subscales: i) She asked for it (8 items), ii) It wasn't really rape (5 items), iii) He didn't mean to (5 items), iv) She wanted it (5 items), v) She lied (5 items), vi) Rape is a trivial event (5 items), and vii) Rape is a deviant event (7 items). Other than the items in these subscales, an additional five "filler items" ([Payne et al., 1999](#); p.22) are there, which makes it a 45 item scale. The scale has a reliability of .93, and the subscale alphas range from .74 to .84. Since [Payne and colleagues \(1999\)](#) stated that the concept of rape myth is time-bound and may suffer from outdated language and cultural representation, there is a need to upgrade the scale from time to time to cater to the modern generation efficiently.

Hence, [McMahon and Farmer \(2011\)](#) brought a revised (updated) version of the IRMAS scale, which is more efficient and modern. The authors retained four significant factors: i) It wasn't really rape (6 items), ii) He didn't mean to (6 items including both the normal items and intoxication items), iii) She lied (5 items), and iv) She asked for it (5 items). This 22 item tool utilized a Likert-type five-point rating scale, which ranged from "strongly disagree" to "strongly agree". Ever since this scale was devised, it has been cited many times, and this tool has been used and revised in different occasions ([Bennett et al., 2017](#); [Debowska et al., 2015](#)). [Jonason et al. \(2017\)](#) used it to determine the rape-enabling attitudes of American participants. [Kühn et al. \(2019\)](#) assessed sexual aggression occurring due to gaming behavior. In a recent study, the updated IRMAS was used to determine the rape myth acknowledgment and rejection among female college students ([Wilson et al., 2020](#)).

The present study

This study aims to explore the factor structure of the updated IRMAS, in the context of the Indian Population (state of Tripura) and to determine its reliability, validity, and other psychometric properties. This shall provide an accurate arrangement of items and the structure of the test, which shall make it fit for future administrations to the Population of India to assess rape myth acceptance.

Method

Sample

For the purpose of determining the factor structure of the updated IRMAS, it was administered to both the men and women. While this study assesses the myths related to rape, when the women are the victims, it is to be noted that the myths can be held rigidly by both the sexes alike. For this purpose, 429 participants, which not only included men ($n = 139$), but also women ($n = 290$), were administered the scale. The participants are from the Indian state of Tripura. Only highly willing participants were included in this study. Another inclusion criteria was that the participants should be proficient in English. The mean age of the participants was 24.83 and the range of age was 20-30 years.

Measure

The updated IRMAS by [McMahon and Farmer \(2011\)](#), was administered to the participants. The scale utilizes a five point Likert-type scale, where the scores range from 1 (strongly agree) to 5 (strongly disagree). Higher scores in the test indicate greater rejection of rape myths. There are four scales in the test: i) It wasn't really rape (6 items), ii) He didn't mean to



(6 items including both the normal items and intoxication items), iii) She lied (5 items), and iv) She asked for it (5 items). The Cronbach's alphas of the subscales ranged from .64 to .80. The Cronbach's alpha for the entire test was found to be highly reliable ($\alpha = .87$).

Procedure

Data was collected from the students of different colleges and universities of Tripura, India. The responses were properly scored and tabulated. At first, t-tests were conducted between the top and bottom 27% scores on each item to determine if the items differentiated extreme groups. The items having significant t values were then subjected to item-total correlation using the Pearson 'r' statistic (Patton et al., 1995). The items meeting these criteria were then subjected to principal component analysis (PCA), followed by exploratory factor analysis (EFA). Following Gorsuch (1983), the EFA was conducted utilizing the PROMAX rotation method, which is a type of oblique rotation. There were no assumption of the number of potential factors, as it was made free to vary because of the test is being administered in a novel (Indian) population. After the factors and the loadings were derived after conducting the factor rotation, the derived model underwent the confirmatory factor analysis (CFA) to assess its accuracy. Using CFA, the reliability and validity of each of the derived factors were also determined. This step included the conduction of inter-factor correlation. To further strengthen the reliability and validity analysis, an inter-item correlation for each of the factors were conducted. Finally, the t-test was conducted to determine the gender differences in the total scores. The norms and Cronbach's α were also found out for the scale. The statistical data analyses and visualizations were done in IBM SPSS v25 and R-Studio.

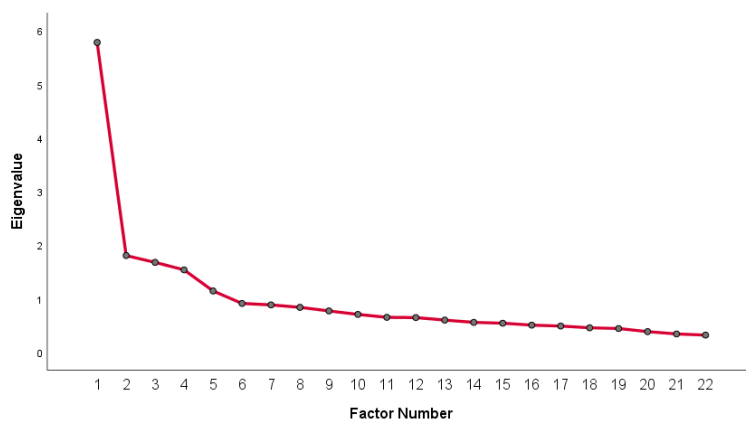
Results

Table 1 reveals that the mean response to several items of IRMAS are found to be above 4, which is in the higher side in a five-point Likert-type scale. However, the least mean of 2.84 was noted for item 9: "Rape happens when a guy's sex drive goes out of control". No item had a mean response of below 2. The skewness of items is found to be satisfactory. All the items fall within the skewness cutoff of -2 to +2 (Field, 2009; Gravetter & Wallnau, 2014; Trochim & Donnelly, 2006), except for item 16: "If the accused "rapist" doesn't have a weapon, you really can't call it rape". Since its skewness value lies right at the threshold of the lower side of the criteria, item 16 was not rejected. The item-total correlations are found to be positive and significant at 99% level of confidence.

Table 1.

Mean, Skewness, and Item-Total correlation for each item.

Items	M	Skew	<i>p</i>
1	4.18	-1.23	.466**
2	4.29	-1.49	.538**
3	4.26	-1.5	.523**
4	3.3	-0.22	.529**
5	4.46	-1.88	.479**
6	3.58	-0.42	.511**
7	2.88	0.14	.310**
8	3.35	-0.14	.455**
9	2.84	0.18	.389**
10	4.03	-0.95	.481**
11	4.38	-1.85	.506**
12	3.87	-0.82	.570**
13	4.07	-1.11	.566**
14	4.2	-1.41	.588**
15	4.42	-1.7	.496**
16	4.59	-2.26	.463**
17	3.59	-0.51	.452**
18	3.3	-0.15	.578**
19	3.36	-0.11	.512**
20	3.49	-0.18	.627**
21	3.66	-0.56	.525**
22	3.28	-0.07	.524**

Figure 1. *Scree plot*

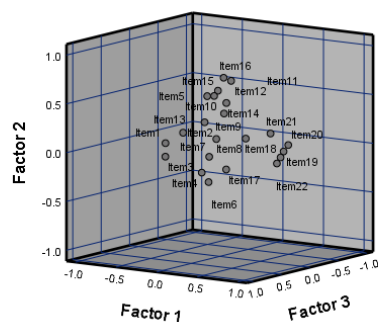


Figure 2. The PCA plot showing the first three factors.

The PCA was conducted, which provided a total of five factors, having eigenvalues of more than 1, as shown in the scree plot (Figure 1). Both the KMO and Bartlett test of sphericity showed significant results (KMO = 0.861 and $\chi^2 = 2641.93$; $p < .001$ respectively), thus verifying that the data is fit for factor analytic measures (Silva et al., 2014). Then, while conducting an EFA, the factors were rotated utilizing the oblique rotation technique of PROMAX, following Expósito et al. (2014) in their Spanish adaptation of the IRMAS. The cutoff for loadings was set at 0.5 (Hulland, 1999; Truong & McColl, 2011).

Following these criteria, as indicated in Table 2, the first factor consisted of items 18 to 22 which explained the largest variance (26.27%). The second factor contained the items 5, 10, 11, 12, 15, 16 and explained 8.2% of the variance. The third factor contained items 1, 2, 3, 4, and 6. The fourth and fifth factors are composed of the rest of the 6 items. The plot showing the first three factors, which explain most of the total variance, and the position of the different items is shown in Figure 2.

Since this present study is not about the local adaptation of the scale, it was chosen not to name the factors at this stage. There is a cross loading noted for item 6, however, due to its higher loading on factor 3, we place it there, and not on factor 4, while proceeding with the CFA. The cutoff for the communalities (h^2) is .40 and above, as stated by Osborne et al. (2008), and in the present model, all the items except item 11 were found to fulfill the criteria. Since the h^2 of this item is slightly below the cutoff, it was not rejected. The reliability of the extracted factors was found to be satisfactory. The cutoff for Cronbach's α being .60 (Hulin et al., 2001), it can be stated that factors 1, 2 and 3 have fair reliability, however, the other two factors are just at the threshold of acceptance.

Table 2.

The EFA estimates.

Items	Factors					h ²
	1	2	3	4	5	
18	0.779	0.242	0.325	0.287	0.145	0.562
19	0.743	0.249	0.256	0.168	0.100	0.608
20	0.827	0.349	0.303	0.302	0.133	0.627
21	0.619	0.361	0.223	0.219	0.125	0.491
22	0.702	0.159	0.269	0.288	0.167	0.442
5	0.252	0.616	0.397	0.183	0.010	0.516
10	0.236	0.595	0.283	0.094	0.296	0.657
11	0.277	0.696	0.163	0.201	0.248	0.394
12	0.369	0.591	0.324	0.227	0.284	0.686
15	0.198	0.620	0.206	0.461	0.122	0.417
16	0.237	0.710	0.213	0.278	-0.041	0.509
1	0.173	0.317	0.727	0.226	0.029	0.417
2	0.320	0.432	0.726	0.129	0.066	0.573
3	0.225	0.253	0.783	0.326	0.137	0.685
4	0.413	0.135	0.658	0.353	0.157	0.486
6	0.405	0.044	0.583	0.505	0.142	0.548
13	0.216	0.440	0.355	0.700	0.234	0.539
14	0.289	0.499	0.255	0.767	0.167	0.609
17	0.304	0.050	0.278	0.706	0.168	0.561
7	0.053	0.042	0.085	0.183	0.796	0.696
8	0.387	0.269	0.147	0.169	0.549	0.416
9	0.120	0.204	0.085	0.172	0.823	0.503
% Variance Explained	26.268	8.203	7.624	6.985	5.202	
Cronbach's α	.796	.733	.742	.639	.616	

Loadings and h² above .5 and .4, respectively are boldfaced

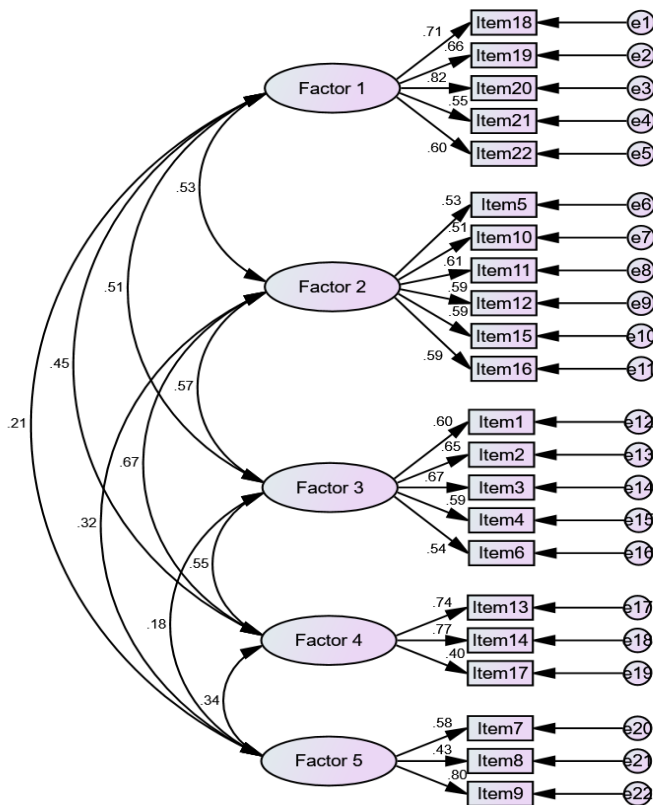


Figure 3. The Factor Structure of IRMAS.

Table 3.

The CFI Estimates of IRMAS.

χ^2/df	df	p	CFI	GFI	AGFI	SRMR	RMSEA	PCLOSE
2.236	199	.000	.9	.912	.89	.06	.054	.174

Table 4.

The Reliability and Validity for IRMAS.

	Correlations						
	AVE	CR	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5
Factor 1	.456	.871	.675				
Factor 2	.327	.820	.535	.572			
Factor 3	.377	.828	.506	.571	.614		
Factor 4	.434	.770	.447	.671	.551	.659	
Factor 5	.388	.735	.211	.32	.179	.335	.623

Square root of AVE across the diagonals (boldfaced)
 All the inter-factor correlations are significant ($p < .001$)



After the factors were tentatively identified and the items were allocated accordingly, a CFA, using the maximum likelihood estimation procedure was conducted, following [Oh and Neville \(2004\)](#), to verify that the model is a good fit. Figure 3 illustrates the loadings for each item. [Hu and Bentler \(2009\)](#) and [Schermelleh-Engel et al. \(2003\)](#) provided the following important indices for CFA along with their cut-offs: $\chi^2/df \leq 5$, $p \geq .01$, $GFI \geq .95$, $AGFI \geq .90$, $CFI \geq .90$, $SRMR \leq .08$ and $RMSEA \leq .08$. The SRMR and RMSEA can range between 0.05 and 0.10, however, we can consider it to be an average fit. As indicated in Table 3, the present model was found to be a good fit, though the GFI and AGFI were a few units shorter than the cut-off. The justification for p to be below .01 is in the fact that a large sample ($N = 429$) was used here. Large samples tend to reduce the p -values because of the diminished impact of random errors ([Thiese et al., 2016](#)). With all other criteria being met, the model gets accepted here, since the deviations in GFI and AGFI from their respective norms are negligible (0.04 and 0.01 respectively). As observed in Table 4, the composite reliability (CR) coefficients for each of the factors of IRMAS were satisfactory and acceptable against the cut-off of .70 ([George & Mallery, 2003](#)). The discriminant validities among the factors were found to be acceptable since for each factor, the root AVE exceeded the inter-factor correlations ([Henseler et al., 2015](#); [Kline, 2011](#)). One exception is in the correlation between factors 2 and 4 (.671), where the correlation coefficient slightly exceeds the root AVE (.659), which means these two factors are related to each other. The convergent validity of the factors could not be established because none reached the AVE cutoff of .50 and above ([Hair et al., 2006](#)).



Table 5. Showing the inter-item correlation across the factors

Items	18	19	20	21	22	5	10	11	12	15	16	1	2	3	4	6	13	14	17	7	8	9	
18	1	.471**	.588**	.374**	.436**																		
19		1	.576**	.295**	.389**																		
20			1	.429**	.468**																		
21				1	.423**																		
22					1																		
5						1	.265**	.275**	.234**	.303**	.411**												
10							1	.389**	.305**	.241**	.265**												
11								1	.438**	.326**	.371**												
12									1	.345**	.270**												
15										1	.428**												
16											1												
1												1	.416**	.477**	.293**	.295**							
2													1	.444**	.369**	.303**							
3														1	.392**	.335**							
4															1	.402**							
6																1							
13																	1	.579**	.282**				
14																		1	.289**				
17																			1				
7																				1	.217**	.480**	
8																					1	.334**	
9																						1	



The inter-item correlation was conducted (Table 5) to shed further light on the internal consistency of the test. A positive correlation, ranging from below average to average magnitude was found for each of the items belonging to their respective factors. No negative or high correlation (above .60) was found. However, all the correlations were found to be significant at more than 99% level of confidence.

Table 6.

Descriptive statistics and other information about the male, female and total sample responses in the test.

	<i>M</i>	<i>SD</i>	Range	<i>t</i>	Cronbach's α
Female	84.66	13.37	51-110	2.89**	
Male	80.77	12.94	51-110		
Total Test	83.41	13.34	51-110		.855

** $p < .001$

As shown in Table 6, there is a significant difference between the total test scores obtained by men and women. The women were found to possess slightly higher score mean than the men, indicating a stronger rejection of the rape myths among the female participants. The mean of the total scores for the entire sample size was found to be 83.41, with an *SD* of 13.34 (C.V. = 15.99%). The total-sample test had a Cronbach's α of .855, indicating high reliability.

Discussion

The factor structure and other psychometric properties of IRMAS were determined for the Indian population. The *t*-test among the top and bottom responses for each item and the item total correlation provided a quick check on how reliable the items are. No items were rejected on these grounds, which permitted to move to PCA and EFC. A total of five factors were derived, which were then rotated obliquely using the PROMAX rotation. The items were finally allocated to the five factors based on their loadings with the factors. Payne et al. (1999) had warned that little research had been conducted to determine the true underlying structure of rape myth acceptance. Feild (1978) gave eight factors; Briere et al. (1985) gave four factors in their respective factor analyses of IRMAS. In fact, McMahon and Farmer's (2011) updated IRMAS derived four factors (merging the "He didn't mean to" intoxication items).

The reliability of each of the five factors in the present study, were within acceptable limits. Similar Cronbach's alphas were noted for the four factors in the Korean Rape Myth



Acceptance Scale (KRMAS), which was developed by taking most items from IRMAS (Oh & Neville, 2004). Together, the five factors explained 54.28% of variance in the present study. In a Turkish adaptation of the IRMAS, the factors were found to explain 41.57% of the variance (Çoklar & Meşe, 2014). In a recent Chinese adaptation, out of their five factors, the fourth one had the highest α of .76 and the fifth one had the lowest of .38 (Xue et al., 2019).

Then, this hypothetical model was tested for good of fitness using CFA. The model estimates were found to be satisfactory. High composite reliability was noted for each factor. While the discriminant validity measures showed acceptable results, which indicated the factors' uniqueness and dissimilarity, the convergent validity of the factors was not verified successfully. The reason behind it was the low loadings in each item in the CFA. A probable reason for the low loadings is the lack of a high sample size (e.g., $N = 1000$ or more). However, it should also be strongly noted that Lonsway and Fitzgerald (1995) examined rape myth acceptance scales using just 429 undergraduate participants, which was further split into three different phases of their study. Generally, it is stated that the items loaded with at least 0.7 can provide satisfactory AVE (Hair et al., 2010). However, researchers also argue that when the composite reliability is high, it shall serve as satisfactory convergent validity itself, even when the AVE is low (Fornell & Larcker, 1981). In that case, the convergent validity shall not be prioritized anymore.

Additionally, the item-total correlation conducted in the very beginning of the analysis, provided the strong content validity of the test. The inter-factor correlation and inter-item correlation were computed to make the reliability statement even stronger, which were found to be highly significant ($p < .01$). This establishes the point that the low AVE did not steal from the validity of the test. This is also in light of the fact that no prior study showed detailed convergent and discriminant validity for IRMAS, using the AVE estimate. The gender difference in the mean scores of IRMAS was found to be significant, thus concurring with the findings of Kennedy and Gorzalka (2002) and Xue et al. (2016).

Conclusions, limitations, and future scope

There was a dire need to establish the factor structure and other psychometric properties of a rape myth scale in the Indian context. The present study came up with five factors in the IRMAS scale, which was validated and deemed reliable for use among the Indian population. Additionally, this study paves the way for the involvement of a larger population sample to conduct an Indian adaptation of the scale in local languages, which shall make the test more reliable and valid for administration in Indian settings.



One drawback of this study is that the sample was not large enough, though statistically adequate. Had there been a larger sample size, the minor discrepancies between the estimates of CFI, validity measures, and their respective norms could be eradicated, and in this way, we could expect perfect values for standardization. Secondly, this study did not aim to develop a local adaptation of the updated IRMAS. The scale was found to work satisfactorily among the target population, but an adaptation in a local language could yield more accurate results. Hence, it is suggested that the study is followed by more relevant research to adapt the scale locally, standardize it, and come up with respective norms of various strata of the population. This study can serve as a strong theoretical background in the upcoming studies on rape myths in various regions of India and neighboring countries.

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Competing Interests

The authors have declared that no competing interests exist.



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