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Original Research Article

Cross-Cultural Adaptation and Validation of the Maleka Stroke Community Reintegration Measure among Igbo Stroke Survivors

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ABSTRACT

Background: The Maleka Stroke Community Reintegration Measure (MSCRIM) was originally developed and validated for measuring post-stroke community reintegration (CI) in a low-income South African community

Purpose: This study was designed to cross-culturally adapt and validate the MSCRIM among stroke survivors of Igbo tribe in South-Eastern Nigeria.

Methods: The MSCRIM was adapted to the Igbo culture and environment by a nine-member expert panel and was pretested on nine stroke survivors. The adapted MSCRIM (A-MSCRIM) and the Subjective Index of Physical and Social Outcomes (SIPSO) were administered through interview to 54 stroke survivors consecutively sampled from six tertiary hospitals in the South-East Nigeria. The A-MSCRIM was administered again after four days. Correlation between participants' scores on the A-MSCRIM and the SIPSO, and between the A-MSCRIM scores on the two occasions were analysed using Spearman Rank Order Correlation and Intra-class Correlation Coefficient respectively. Internal consistency of A-MSCRIM was analysed using Cronbach's alpha. Alpha level was set at 0.05.

Results: All the 40 items on the original MSCRIM were retained but 18 were modified during the process of cross-cultural adaptation. There was a significant correlation between the participants' total scores on the A-MSCRIM and the SIPSO (r=0.81). Participants' total and domain scores on the A-MSCRIM correlated significantly on the two occasions (ICC=0.86- 0.98). The Cronbach's alpha for correlation on the different domains of the A-MSCRIM was 0.90.

Conclusion: The Igbo-culture adapted Maleka Stroke Community Reintegration Measure is valid, reliable and internally consistent and is recommended for measuring post-stroke community reintegration among Igbo stroke survivors.

Key words: Community reintegration, Maleka Stroke Community Reintegration Measure, Cross-cultural adaptation, Validation, Stroke survivors, Igbo culture.

INTRODUCTION

Stroke is a common and debilitating event associated with a detrimental impact on patients' health-related quality of life and a high economic cost, limiting the survivors in daily functional tasks and participation in community activities. [1-3] The incidence of stroke and the rate of disability arising from stroke have drastically increased in medically-underserved and lower-income countries. [3] The advent of better treatment such as thrombolysis and improvements in acute rehabilitation services has resulted in increased survival of people affected by stroke with many of such survivors ending

up with long-term disabilities that tend to restrict their daily functional tasks and their participation in community activities. [2,4,5] Consequently, the goal of management of stroke survivors has shifted from mere survival to how well they can be reintegrated into their community after discharge from hospital. [2, 6-9]

Community reintegration/ integration, defined as the assumption of culturally and developmentally appropriate social roles following disability, is a multidimensional construct that may include several domains. [2,9-12] Considerable attention has been given to community reintegration, with its conceptualisation varying among authors, different persons with disability, different groups, ages, races, and in different cultures and environments. [12-14] Community reintegration is considered as the hallmark or the end point of stroke rehabilitation and as the primary goal for persons recovering from debilitating illness or injury. [15] Consequently, there is need for availability of valid, reliable, feasible and environment-specific scales for its adequate assessment. [2, 7, 9,16]

Many standardized tools for assessing community reintegration of stroke survivors are available in literature. [10, 17-20] However, most of these tools were developed and validated in developed countries of the world. Due to the fact that standardized tools often reflect the environment and culture of the people they are originally developed for, these tools may not be appropriate for use in developing countries [21,22] whose culture and environment vary considerably from those of developed countries. Recognizing this fact, Maleka [14] in 2010, developed and validated an instrument, the Maleka Stroke Community Reintegration Measure (MSCRIM) (urban and rural versions) for assessing community reintegration among stroke survivors in low-income communities of South Africa. According to Maleka, [14] prior to the development of the MSCRIM, standardized tools for assessing community reintegration among stroke survivors, originally developed for Sub-Saharan African countries were not available in English medical literature. The MSCRIM is a forty-item, six-domain scale that has been shown to meet criteria for construct validity ($r= 0.88$; $p = 0.0001$ when compared with Frenchay Activities Index) and internal consistency (alpha = 0.95) in assessing the level of community reintegration among stroke survivors in poor urban communities of South Africa. [14] Each of its items is scored on a three-point (0-2) or four-point (0-3) scale. The scale is a self-report and it is administered through interview. The score for each domain is computed as the sum of all the scores of the checked items divided by the maximum possible sum of the checked items in the domain multiplied by 100%. The total score for the MSCRIM (urban version) is the sum of all the scores of all the checked items divided by the total possible score of all the checked items multiplied by 100%. Although South Africa is an African country, its culture and environment are different from those of Nigeria. It is advisable to cross-culturally adapt a scale before use in a different culture and environment. [21,23] The present study was therefore designed to cross-culturally adapt and validate the urban version of MSCRIM among stroke survivors from one of the major Nigerian cultures, Igbo, which is widely practiced by about 24 million people across Nigeria and a minority in Equatorial Guinea. [24]

MATERIALS AND METHODS

This was a cross-sectional survey with a validation design. Permission to cross-culturally adapt the Maleka Stroke Community Reintegration Measure (MSCRIM) to Igbo culture and environment was obtained from the developer. The research protocol was approved by the University of Ibadan/University College Hospital Ethics Committee. The procedure employed in

this study followed the guidelines for cross-cultural adaptation by Beaton et al, [21] and was in two phases: cross-cultural adaption and validation phases.

The original English urban version of the MSCRIM was adapted to Igbo culture and environment at a meeting by a panel of nine experts who were all familiar with the Igbo culture and environment having lived and worked in Igbo land for at least six years. The expert panel comprised four researchers who were familiar with health measuring scales and questionnaires and four physiotherapy clinicians who were experienced in the management of the stroke survivors. One of the authors served as the moderator. Six of the experts were of Igbo origin. The semantic equivalence, idiomatic equivalence, experiential equivalence and conceptual equivalence of the items on the MSCRIM in Igbo culture were provided by the experts where necessary. The pre-final Igbo culture adapted version of the MSCRIM was then pretested on nine adult stroke survivors of Igbo origin attending physiotherapy out-patient clinic in one of the selected hospitals. The nine stroke survivors also participated in cognitive debriefing interview. Findings from the pretest and cognitive debriefing interview were reviewed by the expert panel at a second meeting to produce the final Igbo culture adapted MSCRIM.

The validation of the A-MSCRIM involved 54 stroke survivors consecutively sampled from the physiotherapy outpatient clinics of the remaining six hospitals (five tertiary and one secondary) in the five states that constituted the South-East Nigeria, the Igbo land. The participants understood English; had no cognitive or communication impairment or any other disabling conditions such as amputation, severe osteoarthritis, rheumatoid arthritis, et cetera. Participants must have been living in the community for at least three months before stroke onset and three months after discharge from hospital following stroke. The final adapted Igbo-culture English urban version of the MSCRIM, and the Subjective Index of Physical and Social Outcome (SIPSO) were administered through interview to the 54 adult stroke survivors. The SIPSO is a 10-item, 2-domain self-report scale for assessing the level of community reintegration among stroke survivors. [25] Each item of the SIPSO is scored on a five point (0-4) scale. The total score is calculated by summing up the item scores. The SIPSO has been shown to possess good construct validity and good internal consistency and high test-retest reliability. [26] The order of the administration of the two questionnaires was randomized using simple randomization method. The urban version of the MSCRIM was re-administered on the participants four days after the first administration by the researcher.

Statistical analysis: The demographic and clinical variable data as well as the scores of the Igbo-culture adapted urban version of the MSCRIM and the SIPSO scores were summarised using frequency counts and percentages, mean and standard deviation. Correlation between participants' scores on MSCRIM and SIPSO was analysed using the Spearman rank order correlation. The Intraclass Correlation Coefficient (ICC) was used to determine the degree of agreement between participants' scores on A-MSCRIM on two occasions in order to determine its test-retest reliability. The Cronbach's alpha was used to determine the internal consistency of the adapted MSCRIM. The level of significance was set at 0.05.

RESULT

Table 1: Summary of Words and Phrases Modified in Adapting the MSCRIM (Urban Version) to Igbo Culture and Environment

Domain	Item	Original	Adapted
1	2	Are you able to pour water into a kettle/basin?	Are you able to pour water into a kettle/basin/**bucket**?
1	3	Are you able to wash yourself?	Are you able to wash/**bath** yourself?
1	11	Are you able to collect water from the river/communal tap?	Are you able to collect/**fetch** water from the river/communal tap/**wells/underground water reservoirs**?
1	12	Are you able to carry heavy object(s) for example shopping bags (2-3)?	Are you able to carry heavy object(s) for example **20 litre jerry can of water/oil or a crate of bottled soft drink**?
1	13	Are you able to get to the clinic/hospital to collect your medication or for rehabilitation/nursing/ medical help?	Are you able to get to the clinic/hospital/ **chemist/ pharmacy** to collect your medication or for rehabilitation/nursing/ medical help?
1	14	Are you able to use the same transport you used before the stroke?	Are you able to use the same transport you used before the stroke **for example bus, taxi cabs, motorcycle (okada), tricycle (keke napep)**?
1	16	Are you able to get out of the house to go shopping in town or going out with friends or watch a soccer match at a stadium?	- Are you able to get out of the house to go shopping (**market**) in town or going out with friends/**family members** or watch a soccer match at a stadium/**school football field/commercial television viewing centre**?
2	3	Are you able to attend burial society, social club meetings and other structures meeting or meetings called by the chief/councilor in your community?	Are you able to attend social club meetings and other structured meeting **(e.g. kindred/clan meetings, neighbourhood associations, town unions**) or meetings called by the leaders in your community?
2	4	Are you able to carry out your community roles e.g. singing in the choir, helping at the local school, digging of a grave, community leadership, preaching or evangelizing to people or burying your congregates?	Are you able to carry out your community roles **e.g. singing and dancing with age groups/grades meeting**, digging of a grave, community leadership, preaching or evangelizing to people or burying your congregates, **community development activities, environmental sanitation activities, road repair**?
2	5	Are you able to attend religious, spiritual and other religious related activities e.g. bible studies, home cell meetings, prayer meetings?	Are you able to attend religious, spiritual and other religious related activities e.g. bible studies, home cell meetings, fellowship, prayer meetings**, singing in the choir**?
2	6	Are you able to do a physical activity such as playing any sport?	Are you able to do a physical activity such as playing any sport, **trekking, brisk walking, jogging, gardening**?
3	1	Are you able to clean your house and yard i.e. sweep, pick up papers and/or mudding the floors with cow dung?	Are you able to clean your house and yard i.e. sweep, pick up papers and/or **mop or scrub the floor**
3	2	Are you able to cook and prepare meals for your family?	Are you able to cook or prepare meals for your family **or carry out minor repair works at home e.g. changing bulbs**?
3	3	Are you able to clean the area and utensils used for preparing meals?	Are you able to clean the area and utensils used for preparing meals?/**Are you able to wash or clean your car.**
5	1	Are you able to take care of your livestock (if you have) e.g. feed your dogs or herd/tend your cattle/ goats, including milking?	Are you able to take care of your livestock/**domestic animal** (if you have) e.g. feed your dogs or herd/tend your cattle/ goats, **sheep, chicken**?
5	2	Are you able to teach children home keeping tasks e.g. cultural/traditional cooking, and mudding with cow dung?	Are you able to teach children home keeping tasks e.g. cooking, **house cleaning, mopping and scrubbing**?
6	1	Are you able to go back to work (paid or volunteer)?	Are you able to go back to work/**business** (paid or volunteer)?
6	2	Are you able to attend school or training programmes (including adult education) in or out of your community?	Are you able to attend school or training **workshop**/programmes (including adult education)in or out of your community?

Key: Modified words/phrases are boldened

All the 40 items on the original MSCRIM were retained but 18 were modified during the process of cross-cultural adaptation (table 1). Three terms were removed from domains 2 and 5 while four terms were replaced with Igbo culture conceptually equivalent terms. Twenty five examples and 13 alternative terms were provided by the expert panel in 13 items across the domains of the MSCRIM. Two examples of activities that are practised by both sexes were added to examples in items 2 and 3 in order to make the item applicable to both sexes. The expert panel suggested that an additional response option, "Not Applicable", should be added to the response scale. All the nine stroke survivors (6 males and 3 females; mean age = 56.56 ± 12.41 years) involved in the pre-test and the cognitive debriefing interview reported clarity of language and ease of understanding of all the items. The participants also agreed that all the activities in the Igbo-culture adapted urban version of MSCRIM were normally practiced in Igbo culture, and therefore, were relevant for community reintegration among Igbos. At the second expert panel

meeting, the consensus was that participants' responses at pretest justified the additional response option of "not applicable". No other adjustment was made by the expert panel.

The mean age of the 54 stroke survivors who were involved in the process of validating A-MSCRIM was 56.58±10.42 years. Thirty-six (66.7%) participants had at least secondary education while 24.1% of the participants were single, separated or widowed (table 2). Twenty-four (44.4%) participants were ambulating independently while unemployment rose from 1.9% pre-stoke to 37.7% post-stroke (table 2).

Table 2: Socio-demographic and Clinical Variables of Participants

Variable	Class	Frequency(n)	Percentage (%)
Sex	Male	34	63.0
	Female	20	37.0
Highest Education Attainment	Secondary	24	44.5
	Post-secondary	25	46.3
	Post-graduate	4	7.4
Marital Status	Single	4	7.4
	Married	41	75.9
	Separated	2	3.7
	Widowed	7	13.0
Side of Weakness	Right	21	38.9
	Left	31	57.4
	Both	2	3.7
Ambulation Status	Independent	24	44.4
	With Cane	18	33.3
	With Walking frame	5	9.3
	Wheelchair	7	13.0

KEY: ES= Employment status, MSCRIM= Maleka Stroke Community Reintegration Measure

There was a significant correlation between the participants' total scores on the Igbo-culture adapted urban version of the MSCRIM and the SIPSO (r=0.81, p=0.00) indicating evidence of excellent construct validity of the former (table 3). The scatter plot of the correlation between the MSCRIM and the SIPSO scores is shown on Figure 1. Participants' scores on the Igbo-culture adapted urban version of the MSCRIM correlated significantly on the two occasions (ICC=0.86- 0.98, p=0.00) showing evidence of test retest reliability (table 3). The Cronbach's alpha for correlation on the different domains of the Igbo-culture adapted urban version of the MSCRIM was 0.90 (p=0.00) thus indicating excellent internal consistency.

Table 3: Intraclass Correlation of MSCRIM Scores on Two Occasions

Domain	ICC	p
Activities of daily living and Self-care	0.925	0.00*
Social Interactions and Relationship	0.961	0.00*
Home/family responsibilities and appearance	0.984	0.00*
Social interactions	0.890	0.00*
Extended family responsibilities	0.859	0.00*
Work and education	0.905	0.00*
All domains	0.979	0.00*

KEY: MSCRIM= Maleka Stroke Community Reintegration Measure *= Significant at p< 0.05

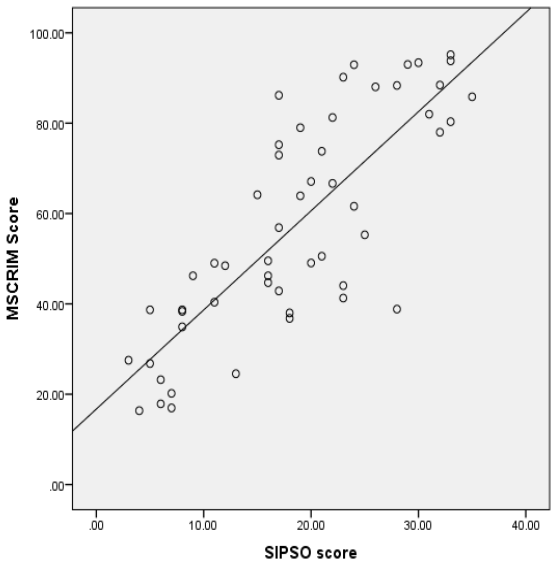

Figure 1: Scatter Plot Showing the Relationship between the MSCRIM and the SIPSO total Scores of the Participants

DISCUSSION

All the items on the original version of the MSCRIM were judged by the expert panel to be relevant for measuring community reintegration level among post-stroke survivors living in South-eastern Nigeria or Igbo land. However, some modifications were made in order to ensure semantic, experiential

and conceptual equivalence of the terms and examples in Igbo environment.

The terms, "burial society", "including milking", and "cultural/traditional cooking" were replaced with Igbo culture conceptually equivalent terms because they do not exist or are not practiced in Igbo land. This is in line with the recommendations by Beaton et al [21] that a newly adapted scale should contain terms that are experientially equivalent in the new culture as the original version is in the culture for which it was developed. In South Africa, the term "burial society" refers to a social club made up of 10 to 20 people. The main aim of this social clubs is to collectively save money and support each other in times of death in the family. The expectation is for one to attend meetings on a monthly basis as well as contributing to savings schemes. Such a structure does not exist in Nigeria. Instead, some people with similar interest may come together in the form of "social clubs" to help one another in times of needs and to contribute to the development of their communities. Consequently, "burial society" was removed from item 3 of domain 2, while more examples of social club meetings were provided. Unlike sheep and chicken, herds/cows are not commonly reared among the Igbos. This is even truer in urban areas in Igbo land. Hence, "milking", an activity that is common among herd/cow rearers, was considered as a very unusual practice among the Igbos and was subsequently removed from item 1 of domain 5. More so, sheep and chicken were included in the list of domestic animals in item 1 of domain 5. "Cultural/traditional" was removed as a qualifier of cooking because cooking is not usually classified in that dimension by Igbo people especially in the urban areas.

Four terms ["shopping bags (2-3)", "chief/councilor", "singing in the choir" and "mudding the floors with cow dung"] were replaced with Igbo culture conceptually equivalent terms. "Shopping bags (2-3)" was replaced with "20 litre jerry can of water/oil and a crate of bottled soft drink" as an example of heavy objects in item 12 of domain 1. This is due to economic downturn of the 1980s that led to the closing down of many supermarkets in Nigeria. It is only a few years ago when some started springing up again. In addition, there are many open markets from where different items are bought and head-carriers help buyers with heavy goods for a fee. The term "leaders" was preferred to "chief/councilor" as conveners of community meetings in item 3 of domain 2 because the councilors rarely hold meetings with people of their constituencies in Nigeria. In Igbo culture, "singing in the choir" is considered to be a religious rather than a community role as portrayed in the original version of the MSCRIM, and was therefore replaced with a conceptually equivalent "singing and dancing in age groups/grades meeting" as an example of community roles in item 4 of domain 2. "Singing in the choir" was then moved from item 4 to item 5 of domain 2 where it changed from being a community activity to being a religious activity respectively. An age group/grade is an association formed by adults within a five-year age bracket. In most cases, they form their own dancing groups. In item 1 of domain 3 of the MSCRIM, "mudding the floors with cow dung" was replaced with "mop or scrub the floor" as an example of act of cleaning the house. In item 2 of domain 5, "mudding with cow dung" was again replaced with "house cleaning, mopping and scrubbing" as an example of home keeping tasks. "Mudding the floors with cow dung" is a very strange activity that is not practiced in Igbo culture.

Some Igbo culture friendly terms and examples were added to some of the items of the original MSCRIM. "Bucket" was added to "kettle/basin" as an example of containers one can pour water into in item 2 of domain 1. This is because bucket is a common water container used in Igbo culture and Nigeria as a whole. The term "wells/underground water reservoirs" was

added as a source of water in item 11 of domain 1. Underground water reservoirs represent plastered underground tanks that are used to store rain water, and are found in many houses in Igbo land. The term "chemist/pharmacy" was added to clinic and hospital as an additional source of medical care in item 13 of domain 1. Many people in Igbo land find it easier to consult pharmacists than going to the hospital to consult doctors, which generally require longer waiting time. Examples of common transportation means [bus, taxi cabs, motorcycle (okada), tricycle (keke napep)] among the Igbo people were provided for better understanding of item 14 of domain 1 by the would-be respondents. Okada and keke napep are nick names for commercial motorcycles and tricycles respectively for transporting people in Nigeria. The term "school football field/commercial television viewing centre" were provided as an additional locations where one can watch a soccer match. In the South-Eastern (Igbo land) part of Nigeria, international football matches such as world cup, African Cup of Nations, European League matches and some high profile national matches are usually watched at commercial television viewing centres. This is because many people cannot afford the subscription for cable television stations that show these matches live. In addition, a few people who can afford the subscription opt for these centres for companionship. On the other hand, local matches are usually played at primary/secondary school football fields. Examples (kindred meetings, neighbourhood associations, clan meetings, town unions) were given on "other structures meeting" in item 3 of domain 2 for better understanding. Kindred are a group of people who are bound by close common ancestral origin. They are found throughout the Igbo community (both rural and urban), and normally hold meeting at regular intervals. Neighbourhood associations are usually formed by people who are neighbours, with the aim of promoting the welfare and security of the neighbourhood. Clans and town unions are formed by people who are from a particular geographical territory. These can be formed at home or away from home.

The reason for the additional response option, "Not applicable" in the A-MSCRIM was to enable the user differentiate between activities that respondents find difficult to perform and those they do not have to perform. They might leave some items unanswered, or might be tempted to give wrong impressions of having "difficulty" or "no difficulty" in the performance of these activities they were not necessarily performing. A typical example is seen in item 11 of domain 1: "Are you able to collect water from the river/communal tap?" Due to many years of no or inadequate public water supply in many cities in South-Eastern Nigeria, many house owners have had to sink and reticulate wells or boreholes, such that they do not need to fetch water from river or communal taps. For those who do not have water supply from a well or borehole, it may not be the responsibility of the respondent to fetch water. Some activities on the urban version of the MSCRIM are more or less gender-specific in the Igbo culture, and thus may not be applicable to the opposite gender. In a bid to further address the issue of gender-specific tasks, two activities considered to be unisex ("or carry out minor repair works at home e.g. changing bulbs" and "Are you able to wash or clean your car") were added to items 2 and 3 of domain 3 ("Are you able to cook and prepare meals for your family?" and "Are you able to clean the area and utensils used for preparing meals?" respectively) that were more or less considered as female-specific tasks in Igbo culture.

The high correlation between participants' scores on both MSCRIM and SIIPO indicates that the two scales measure the same construct, community reintegration post-stroke. This finding implies that the Igbo culture adapted

MSCRIM demonstrated an acceptable (excellent) convergent construct validity for use in assessing the level of community reintegration among Igbo stroke survivors. [27] This finding also upholds the hypothesis that the participants' scores on Igbo culture adapted MSCRIM would correlate significantly with their scores on the SIPSO. The correlation coefficient (r= 0.81) of the relationship between the total scores of the Igbo culture adapted MSCRIM and the SIPSO in this study is similar to what (r= 0.88) was obtained by the developer of the MSCRIM [14] when the total scores of the original MSCRIM and the SIPSO were also correlated. Previous studies that assessed convergent validity of community reintegration scales also reported similar findings. [28,29]

There was a very high correlation between the total (ICC= 0.98) and domain (ICC= 0.86-0.98) scores of the Igbo culture adapted MSCRIM on the two occasions. These values fall within the acceptable (excellent) range for test-retest reliable as reported by Pang et al [2] and Stroke Engine. [27] This implies that the Igbo culture adapted MSCRIM is a reliable tool for assessing community reintegration among stroke survivors in the South-Eastern region of Nigeria. This supports the hypothesis that the participants' scores on the Igbo culture adapted MSCRIM on two occasions would correlate significantly. The internal consistency of the Igbo culture adapted MSCRIM (α= 0.90) as measured with the Cronbach's alpha coefficient (α) in this study is within the acceptable (excellent) range as reported by Stroke Engine. [27] This indicated that the items on the MSCRIM are homogenous and are all assessing different aspects of the same construct, community reintegration among stroke survivors. This supports the alternate hypothesis that the items on the Igbo culture adapted MSCRIM would show significant internal consistency (homogeneity).

CONCLUSION

The Igbo culture adapted Maleka Stroke Community Reintegration Measure (urban version) is a valid, reliable and internally consistent tool for assessing the level of community reintegration among stroke survivors living in Nigeria. It is therefore recommended that the Igbo culture adapted Maleka Stroke Community Reintegration Measure (urban version) be used by clinicians and researchers to assess the level of community reintegration among stroke survivors in Nigeria. The present study was institution-based rather than community-based and may have excluded stroke survivors not receiving treatment at hospitals, and those receiving treatment at institutions other than the ones considered in this study. Participants were however recruited from at least one tertiary hospital from each of the five States that constitute South-Eastern Nigeria in order to ensure some level of generalizability.

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