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Measuring Leisure Through Time-Use and the Concordance Between Stylized Questions and Time Diaries

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Introduction

Time-use data is seen as a reliable source of information for studying daily lives by providing detailed information on the time allocation patterns of individuals. Information collected through time-use studies (TUS) aid in evaluating changes in behaviour and provide trends and patterns over extended periods. These studies have been particularly helpful in recognizing women's unpaid work, highlighting gender inequality, and variations in domestic and care responsibilities, along with being an important indicator of quality of life and well-being, household production, and social participation. This type of granular understanding of how individuals spend their time is not achieved by any other type of survey (Gershuny, 2011). TUS data collection is time-consuming, recall-intensive and expensive, making it; more difficult to collect in developing countries due to the numerous unstructured and marginal activities that are carried out simultaneously (Irani and Vemireddy, 2021). This is further complicated by methodological issues such as data collection methods (direct observation, diary method, or stylized questions), categories of activities, and harmonisation of time-use (Hirway, 2021).

Building on these discrepancies, the aim of this measurement brief is to explore the accuracy of the two methods of data collection—time diaries and stylized questions—to compare the leisure information of older persons aged 60 years and above. Using two recently released nationally representative datasets in India: (i) the National Sample Survey Organisation—Time-

KEY RESULTS

Indian TUS data has recorded activity status in a format similar to the LASI survey used to measure major and simultaneous activities.
From both surveys, leisure has been taken into consideration where it has been listed as a major activity. This helps us preserve comparability. Although there is a little ambiguity in the concordance due to clear delineation of leisure (social/cultural/mass media and personal care/self-maintenance), by using the ICATUS (2016) classification, I manually created concordance with leisure activities at the 2-digit level (for LASI) and accordingly matched for this analysis.

Leisure heterogeneities exist along the nature of residence (rural/urban).
Stark differences in leisure activities were observed in rural and urban areas. While consumption-based leisure activities (like attending events or participating in cultural activities, sports and exercises) were more common in urban areas, rural areas observed leisure in more socialised forms like attending weddings or religious functions. These differences show similar patterns in both the NSSO-TUS and LASI datasets.

Leisure inequality is minimal between men and women.
There is not much difference in leisure practices between men and women in India. Similar findings have emerged in the work of Shu and Das (2024) and Sharma et al. (2024). Studies (Li, 2023) that have looked at trends and changes, have also recorded the decreasing leisure gap between men and women in India. In fact, the intersection of gender and residence shows more pronounced heterogeneities when explored along with education and income. However, these differences could also be attributed to the gendered perception of time and the overlapping of leisure with other household chores.

Discord between stylized questions and time diaries.
Although similar patterns emerge for both the activity participation rate and time spent in leisure activities across residence and gender in NSSO-TUS and LASI, the information on intensity (participation rate or time spent on specific activities) varies significantly. This is due to the expansive list of activities collected by time diaries, whereas stylized questions collect information on broader categories of activities.

Use Studies (NSSO-TUS, 2019), which uses time diaries and (ii) the Longitudinal Aging Study in India (LASI, 2017-18), which uses stylized questions, the brief identifies the major activities reported as leisure (socialisation/ community participation/ self-care).

Leisure is an important aspect of everyday life that contributes to individuals' well-being, more so among older adults who have more free time. Researchers have conceptualized leisure as engagement in free-time activities that one is not obliged to, unproductive activities or [leisure] time that is left after doing paid and unpaid activities. Qualitatively, leisure can be understood and experienced in diverse ways. However, to 'measure' leisure, this brief uses the International Classification of Activities for Time Use Statistics (ICATUS 2016) to include activities like socialisation and communication, community participation and religious practice (activity code: 7); culture, leisure, mass-media and sports practices (8); and self-care and maintenance (9). Overall, this measurement brief compares two dominant strategies (stylized questions and time-use diaries) for measuring time-use.

Method

Data

There has been an absence of time-use statistics in countries such as India. The only Indian time-use data was collected through a pilot study conducted by NSSO in 1998-99. It covered only six Indian states. It was only recently that two datasets were released by the Government of India that explore different aspects of everyday life. The NSSO-TUS Wave I was released only in 2020, marking the first nationally representative dataset, while LASI released its baseline survey in January 2021. Both datasets hold information on older adults aged 60 and above across rural and urban centres of India.

NSSO -TUS (2019)

The NSSO-TUS holds time-use information in a diary format. They collect information in 24-hour time slots starting at 4 am. Time diaries are seen as the most reliable source of time budgets, but they are expensive and more time-consuming to collect. For detailed information on the activities, refer to Table 1; the categories are borrowed from the NSSO report and remain unchanged.

LASI (Wave-1, 2017-18)

In LASI, the time-use information is part of the experimental modules, where only 25% of the total participants were randomly selected to give information on time-use. The analytical sample is 31,464 older individuals aged 60 years and above. The time-use information was obtained through stylized questions which is a valid alternative method to time diaries. In the stylized question format, the total time spent on a specific activity is asked in a question format, such as *"How much time did you spend watching TV yesterday?"* LASI has information on individual activities that we have put together to match the broad three categories of the NSSO survey.

Other modules of the questionnaire include questions ranging from time spent in paid employment to care work for family and childcare. LASI data is internationally harmonized with the Health and Retirement Survey (HRS) and also investigates questions on health, economic, and social determinants and consequences of population ageing in India.

Comparing the Activities

In ICATUS (2016), leisure activities come under three heads: (a) information on socialisation and communication, community participation and religious activities, (b) culture, leisure, mass media, sports practices, and (c) other self-care practices. I attempted to make the variables comparable in the two datasets. The two datasets operationalise leisure activities differently; hence, some discrepancies remain. For instance, LASI holds information on social activities like going out to eat, going to park for relaxation or entertainment, playing indoor games, attending cultural performances or religious functions, etc. However, instead of how much time individuals spend on these activities, the frequency of engaging in these activities is provided. While there is some information on the time spent on different activities like exercising, yoga, watching television etc. I compare the participation rate and time spent on these leisure categories. For instance, NSSO-TUS comprises activities related to reflecting, resting and relaxing, while LASI does not hold any similar information. Activities like eating outside, religious visits, visiting relatives, using computer are put together under the category—socialisation and communication, community participation and religious

Table 1: List of Activities Identified Under Three Major Heads in NSSO-TUS and LASI

ICATUS (2016)	NSSO-TUS	LASI
7 Socializing & communication, community participation and religious practice	711 Talking, conversing, chatting 712 Socializing/getting together/gathering activities 713 Reading and writing mail (including email) 721 Participating in community celebrations of cultural/historic events 722 Participating in community rites/events (non-religious) of weddings, funerals, births and similar rites-of passage	FS504. Eat out of the house (Restaurant/ Hotel) FS508. Visit relatives /friends FS510. Attend religious functions /events such as bhajan/satsang/prayer FS511. Attend political/community/ organization group meetings FS512. Read books/newspapers/magazines
8 Culture, leisure, mass media and sports practices	811 Attendance at organized/mass cultural events and shows 812 Attendance at parks/gardens 813 Attendance at sports events 821 Visual, literary and performing arts (as hobby) 822 Hobbies 823 Playing games and other pastime activities 831 Participating in sports 832 Exercising 841 Reading for leisure 842 Watching/listening to television and video	FS506. Play cards or indoor games FS507. Play out door games/sports/exercise/ jog/yoga FS509. Attend cultural performances / shows/Cinema FS513. Watch television/listen radio FS514. Use a computer for e-mail/net surfing etc.
9 Self-care and maintenance	911 Night sleep/essential sleep 912 Incidental sleep/naps 913 Sleeplessness 921 Eating meals/snack 922 Drinking other than with meal or snack 931 Personal hygiene and care 932 Health/medical care to oneself	TU001. To begin, please tell me what time you woke up today? TU002. And what time did you go to sleep yesterday? TU025 How much time did you spend doing healthcare related activities yesterday? HC221. What is your travel time (one-way) to that [healthcare] facility?

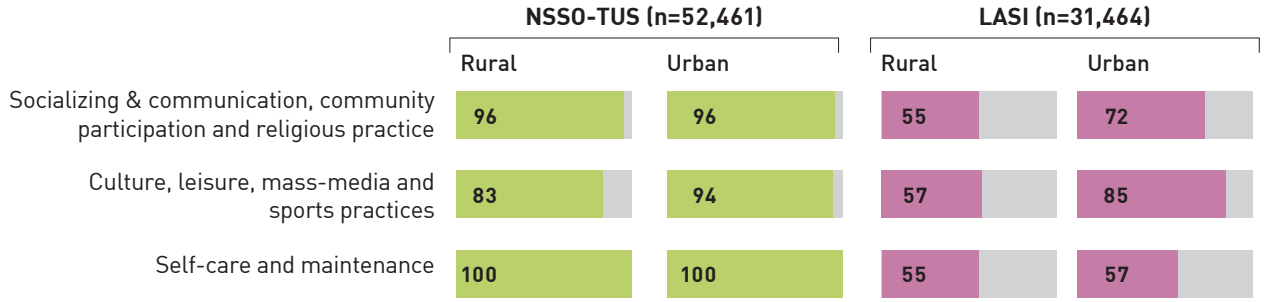
Sources: NSSO TUS (2019) Report; LASI (2017-18 Questionnaire (Individual level)

practice. Although LASI has participation rate for these above-mentioned activities but has not collected information on time spent on these activities. Therefore, while calculating the total time spent for LASI, many activities and time spent on them is lost. Only 2-digit codes are taken into consideration for comparing the two datasets.

Results and Analysis

Table 2 (on Page 5) shows the participation rate of older men and women in leisure activities from rural and urban areas of India. In NSSO-TUS, both rural and urban areas show similar participation rates on social activities. However, stark differences are seen in more consumption-based leisure activities that include going to parks, exercising, participating in hobbies or travelling, due to the resources available in urban centres. In contrast, the percentage of participation between rural and urban areas is starkly different in LASI. Although the pattern of participation between rural and urban areas is similar, the participation rate is significantly different between NSSO-TUS and LASI. These differences are also translated in the average time spent (in minutes) in different leisure activities between rural and urban areas (Table 3). Please note that for all tables, NSSO-TUS aggregates are taken from published reports, while for LASI aggregates are calculated on STATA-16.

Table 2: Percentage of People Aged 60+ Participating in Leisure Activities in a Day: Rural vs. Urban



Notes: 1. Participation as reported about leisure activities on the day prior to the survey.
2. Participation rate is the % of persons performing that activity during the 24 hours of the reference period for both datasets.

Table 3: Average Time (in Minutes) Spent in a Day Per Participant Aged 60+: Rural vs. Urban

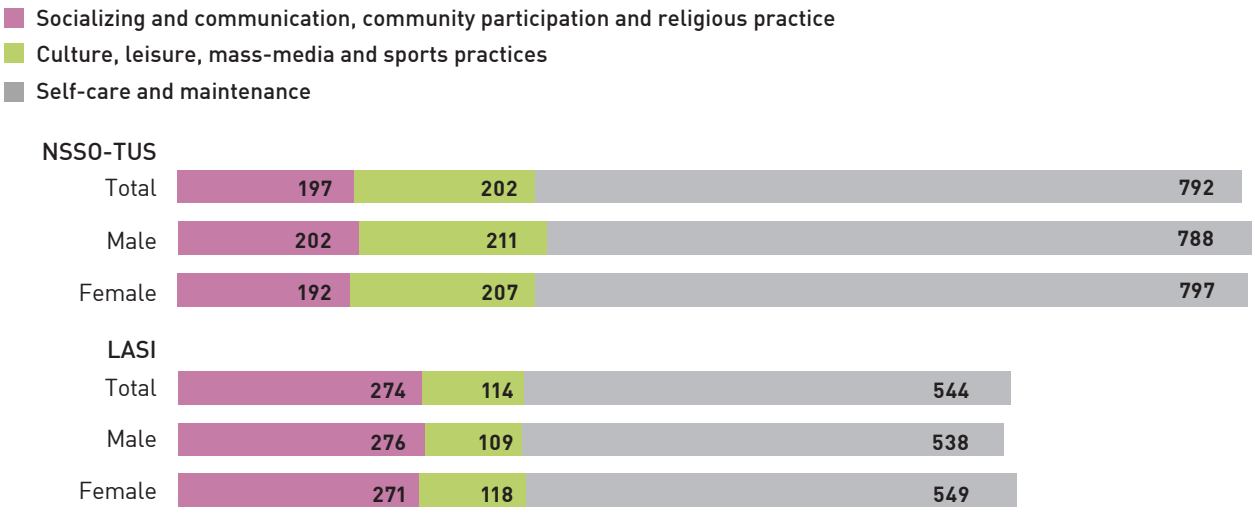
	NSSO-TUS (n=52,461)			LASI (n=31,464)		
	Total	Rural	Urban	Total	Rural	Urban
Socializing and communication, community participation and religious practice	197	200	200	203	290	229
Culture, leisure, mass-media and sports practices	209	191	191	113	103	126
Self-care and maintenance	792	792	792	545	544	545

Source: NSSO TUS (2019) Report; LASI (2017-18) Questionnaire (Individual level)

LASI also suffers acutely from huge amount of missing data which is exceptionally grave for their time-use modules. For instance, 25% of the total sample should have provided information on different TUS questions. That is around 7800 individuals out of ~32,000 individuals should have provided information at the first stage of questions. However, the data holds only ~4000 responses. Time-use data does experience missing information (Hirway, 2010; Mullan and Chatzitheochari, 2019), NSSO-TUS does not experience such high percentages of missing data. Similarly, for time spent on self-care and maintenance includes information on sleep, time spent on doing health care activities, receiving care or travelling for self-care. I am assuming, for NSSO-TUS, the time diaries report time for these activities including sleep, that results into 100% participation while LASI has formulated questions around sleep that focuses on any troubles in sleeping or how often one wakes up during sleep. Similarly, there are no questions on receiving care or time spent on travelling for self-care. There is a question on travelling for healthcare visit which might not be comparable. The differences in percentage values can also be a result of differences in operationalising these definitions. Figure 1 shows the differences between men and women in time spent in different leisure activities.

While previous studies have referred to increased leisure over time (Aguiar and Hurst, 2009), surprisingly, the number of minutes is not starkly different for men and women, especially for more social forms of leisure in LASI, 2017-18 (men: 276 minutes; women: 271 minutes per day). Li (2023) also sees a similar pattern of leisure increase between 1998 to 2019 using the Indian TUS data. Although the above results do not show changes in leisure time, it clearly shows reduced leisure inequalities between genders. However, this can also be due to definitional issues of leisure and its overlap with other unpaid activities or household chores. On running a (linear) regression analysis with

Figure 1: Average Time (in Minutes) Spent in a Day Per Participant Aged 60+: Female vs. Male



Source: NSSO TUS (2019) Report; LASI (2017-18) Questionnaire (Individual level)

leisure time spent as the dependent variable (based on LASI), similar patterns emerged across gender and residence (as independent variables). But, they were not statistically significant. However, significant differences existed across education and employment categories. Due to different categories of education and work are used in LASI and NSSO-TUS, these have been difficult to compare.

The NSSO-TUS diaries hold enough variation in activities to present us with exact pictures of true and unobservable activities; however, the report has clubbed them together under categories that homogenise the results. In contrast, the conventional survey method of stylized questions does not have enough questions that might cover all aspects of one's life. Therefore, the above categories of different leisure activities cannot be exactly comparable, resulting in these differences.

Concluding Remarks

Several studies compare information on work time or unpaid work collected by diary data with interview methods, however, leisure remains unexplored. This is further aggravated due to definitional quandaries of leisure. Similarly, not accounting for covariates does not provide a whole story. For instance, the presence of dependent children is seen to increase the gap between stylized estimates and time diaries due to overlapping of childcare with housework (Otterbach and Sousa-Poza, 2010). Moreover, perceptions of what activities are classified as work or play varies across gender and does play a key role in the differences. This is elaborated further in the work of Sharma, Swaminathan and Lahoti (2024), who question 'Does it matter who you ask for time-use data?' At the same time, TUS statistics are sensitive to measurement error (although not covered in this measurement brief) and is crucial to investigate self-reporting and proxy reporting, as well. Similarly, men with traditional gender attitudes report higher estimates in stylized questions than they report in time diaries (ibid). The literature on TUS survey methodology holds wide discussion on the reliability of the data, yet few papers focus on the implication of such discussions.

These challenges open a diverse range of questions on survey methodologies, comparability of different datasets and the reliability of time-use data. This brief was aimed to start a discussion on how to incorporate time-use questions in large surveys along with various strengths and weakness of specific modes of data collection.

References and Further Reading

Aguiar, M., & Hurst, E. (2009). A summary of trends in American time allocation: 1965–2005. *Social Indi-*

cators Research, 93, 57-64.

Gershuny, J. (2011). Time-use surveys and the measurement of national well-being. *Centre for Time Use Research, University of Oxford, Swansea, UK, Office for National Statistics.*

Hirway, I. (2010). Time-Use surveys in developing countries: An assessment. In *Unpaid work and the economy: Gender, time use and poverty in developing countries* (pp. 252-324). London: Palgrave Macmillan UK.

Hirway, I. (2021). Conducting time-use surveys employing rigorous methods to produce quality data. *The Indian Journal of Labour Economics, 64,* 883-898.

Irani, L., & Vemireddy, V. (2021). Getting the measurement right! quantifying time poverty and multitasking from childcare among mothers with children across different age groups in rural north India. *Asian Population Studies, 17*(1), 94-116.

Li, N. (2023). Women's work in India: Evidence from changes in time use between 1998 and 2019. *World Development, 161,* 106107.

Mullan, K., & Chatzitheochari, S. (2019). Changing times together? A time-diary analysis of family time in the digital age in the United Kingdom. *Journal of Marriage and Family, 81*(4), 795-811.

Otterbach, S., & Sousa-Poza, A. (2010). How accurate are German work-time data? A comparison of time-diary reports and stylized estimates. *Social indicators research, 97,* 325-339.

Sharma, D., Swaminathan, H., & Lahoti, R. (2024). *Does it matter who you ask for time-use data?* (No. 2024/1). WIDER Working Paper.

Hu, S., & Das, D. (2024). Gender, Work, and Leisure in Old Age in China and India. *Journal of Cross-Cultural Gerontology,* 1-27.

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