

Original Research Article

## Establishing Validity and Reliability of Modified Occupational Questionnaire in 18-25 Year Old Unemployed Youths in Delhi-NCR

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### ABSTRACT

**Study Design:** Methodological Study Design.

**Objective:** Estimating validity and reliability of Modified Occupational Questionnaire in 18-25 year olds unemployed.

**Method:** Content validity was established using Content Validity Ratio method. Questionnaire was then piloted on unemployed (n=20) to examine internal validity and test-retest reliability. Another sample of 83 was selected to estimate criterion validity with RAND-36.

**Results:** Modified Occupational Questionnaire demonstrated very good internal validity, including rating scale, item function, and person performance validity; very good item and person reliability indexes (1.00 and 0.99, respectively); and a good person separation index. External validity, including test-retest and criterion validity was also good.

**Conclusion:** MOQ was a valid and reliable tool to assess the basic elements of meaningful time use. Further research was suggested for using MOQ in populations other than unemployed.

**Keywords:** Meaningful time use, Occupation, Life satisfaction, Stigmatization.

### INTRODUCTION

Occupational therapy theory has stated that "occupation is everything people do to occupy themselves, including looking after themselves (self-care), enjoying life (leisure), and contributing to the social and economic fabric of their communities (productivity)." [1] This definition does not delimit occupation to three categories but subsequent statements in the same publication list the "purposes" of occupation as being self-care, productivity and leisure. The same individual might define an occupation differently at different times, dependent upon mood, goals, context and the presence of other people. Thus, "it is

impossible to give an individual's occupation any meaning other than the subjective meaning that they, themselves, choose to give it". [2]

There has been a vast body of literature reporting on the negative health consequences of unemployment. In the exploration of this topic, researchers have taken a variety of perspectives. One such perspective has been the influence of time use. Time use research is a developing interdisciplinary field of study dedicated to knowing how people allocate their time during an average day. From this perspective, there are three differing constructions of time use:

1. The frequency and duration of different activities undertaken
2. Overall time structure
3. The meaningfulness of time use.

Different people use time in different ways and what is meaningful for one person may not be meaningful for another. Housework, for example, may be considered a chore which is best left until absolutely necessary for some, yet for others, it may hold great importance and be a primary way to express their personal values to others. It was clear that the 'meaningfulness' of housework would be greater for the second group. The failure to consider the meaningfulness of time use in previous research may cloud the significance of the association between the way time has been used and the health of unemployed individuals and the quality of occupational engagement in unemployed individuals. [3]

Youth development and empowerment are vital stages in life for building the human capital that allows young people to avoid poverty and lead better, and possibly have a more fulfilling life. [4]

Unemployment has adverse mental and physical health consequences, such as increased stress and depression. Several studies have reported that unemployment is associated with adverse health and low life satisfaction. A recent study in eleven states in the European Union (EU) showed that unemployment led to lower levels of life satisfaction in all the countries studied.

The way in which unemployed people use their time has been an area of interest for many leisure researchers. Although unemployed people have a great deal of 'free time', their leisure experiences are often poor. A number of authors have suggested that this is due to the stigmatization of unemployed people as being 'undeserving' of leisure, as it has not been earned through working. As a group, unemployed people also experience poor health, especially psychological health. [5] This poor health is potentially related to

lack of employment-related opportunities as well as impoverished leisure experiences. To promote better health in unemployed individuals, these activity problems must be addressed [6] and productive engagement in occupations should be promoted.

Young people have borne the brunt of the global economic crisis and the subsequent sluggish recovery. Youth unemployment rates have stayed at peak levels across the world. Currently, the average rate of youth unemployment in Asia and the Pacific is estimated to be around 11 per cent, more than double the rate of the total working age population. In Asia, transition to the labour market remains a major challenge as youth unemployment is more than double the rate of the total working age population. Even after completing formal education, many young people face obstacles in their transition from school to work. Education and training systems often do not match modern labour market demands. The mismatch creates a sub-population of discouraged and excluded youth that are outside the educational system and are also unemployed. [7]

There are more than sixty million well educated youth in India who is unemployed. There has been a drastic increase in the literacy rate in India over the past few decades, which has led to an increase in number of professionals but the number of job opportunities remain unchanged, unfortunately, leading to a massive increase in the unemployment rate. Employment growth in the organized sector, both public and private combined, has registered a decline by -0.32 percent between 1994-2005. With the present situation of economic recession, the number of unemployed is increasing exponentially. [8]

The Modified Occupational Questionnaire (MOQ) documents an individual's participation in occupations by hourly intervals throughout the day. This scale was used to assess importance of meaningful use of time in promoting and maintaining health. In youth this scale

sought to address this gap in the existing literature by exploring the association between meaningful use of time and the psychological health of old people. If an individual had a good meaningful time use then he would have high levels of life satisfaction. [9]

This study hence focused on the validation of MOQ, which is a measure of meaningful time use. Aim of the study was to establish a psychometrically valid tool for assessing meaningful time use in 18 to 25-year-old unemployed in Delhi-NCR so that we would have had an efficient and accurate method of collecting the objective and subjective dimensions of time use in the unemployed youth.

## MATERIALS AND METHODS

Permission to validate MOQ in 18-25 year age group in Delhi- NCR was taken from Justin Scalnan, author of MOQ. Ethical approval for the study was taken from The Institutional Ethics Committee of Indian Spinal Injuries Center, New Delhi, India.

Study was conducted in the following three phases:

**Phase I:** Establishment of content validity

**Phase II:** Field trial for finding out

- a. Construct validity
- b. Rating scale validity
- c. Item function and person performance validity
- d. Statistical validity

**Phase III:** Survey- Relationship between meaningful time use and health

**Phase I- Content validation:** For establishing content validity, the criterion given by McKenzie and colleagues was followed. [10] 10 experts having experience in the field of youth affairs were included in the expert panel. These experts included one psychiatrist, one legal advisor, one social worker, one senior manager, one lecturer and five target group members i.e. unemployed youth aging 18 to 25 years. The pool of items was submitted to the experts and Qualitative and Quantitative reviews were conducted. One target group member

of the expert panel suggested removal of the item, “playing with children” as the activity is not very important for people belonging to 18 to 25 years of age group in the Indian context. All the comments and suggestions given by the expert committee were reviewed by the researchers and it was concluded that no changes were required in the original scale.

For computing content validity quantitatively, Content Validity Ratio (CVR) was calculated. [11] In this method, the same panel of subject matter experts (SMEs) was asked to indicate whether or not a measurement item in a set of all measurement items is essential to the operationalization of our theoretical construct or not. For documentation of the quantitative review, a spread sheet was generated, in which 648 items were included. The members were supposed to rate each item as either ‘essential’, ‘useful but not essential’ and ‘not necessary’. Calculated CVR, were then compared to the levels required for the statistical significance ( $p=0.05$ ). 643 out of 648 items received expert panelist ratings of one (1- ‘essential’) indicating high content validity. CVR values of the rest five items was calculated and found to be less than 0.62 (i.e. less than the critical value required for the item to be retained in the questionnaire). These were item no. 5 (travel), 32 (travel), 522 (sport), 576 (sport) and 603 (sport). The same was communicated to the original developer of the questionnaire MOQ. After a discussion with the author, it was concluded that there was no need of changing the options available according to the hour of the day. Whilst it was probably very likely that very few people will travel at unusual hours, there was no theoretical reason why this could not be done, so it was decided of retaining the full range of activity options for each hour of the day. This also made eventual data analysis more straightforward as well.

**Phase II- Field Trial:** 20 subjects (both males & females) were sampled purposively from the community based on the inclusion

criteria (i.e. community dwelling, unemployed, both males & females should be medically stable, should be able to read & understand English). Many-faceted Rasch Analysis programme FACETS {Version Miniface (Facets Student/Evaluation) Version No. 3.70. John M. Linacre 1987-2012} was used to examine the psychometrics of the scale. After the analysis, an Output file was made and interpretation was obtained from the author of MOQ. After the field trial, single measure score for each participant was derived using the same software. Rasch analysis computer program generated goodness of FIT statistics for items indicating how well the data fit the Rasch model. It allows for the examination of whether the instrument was used in the way in which it was intended. If each individual interprets each item in the same way, then data from each of the items and each of the people will show good fit to the model. When an item demonstrates statistical goodness of FIT to the Rasch model the scale can be said to be unidimensional. [12]

Rasch analysis helped to understand how the various domains of time use varied for each person at every hour of the day across each activity. Rasch analysis is a common method of psychometric evaluation and is based on following two assertions: [13,14]

1. The easier the items, the more likely it is for a person to obtain higher ratings, and
2. The more able the client, the more likely he or she is to obtain higher ratings on hard items than are less able clients.

The output generated from Facets programme included point-measure correlations, separation reliability (separation index and item reliability), item INFIT and OUTFIT statistics, and the item difficulty map. The data matrix included two facets (people and items) and 24 hourly observations for each person. Each hour of the day yielded one line of data (activity

category, reason for doing the activity, value to self and perceived value to society).

Thus, a single measure score for each participant was derived. This analysis approach allowed for the examination of the contribution of each parameter of time use for each activity and across the course of a day for each person.

For estimating the test retest reliability, MOQ was administered twice at a gap of seven days. The time gap of seven days was in accordance with the development of the original MOQ scale. Four subtotals for four domains of MOQ i.e. "activity category", "reason for doing the activity", "value to self" and "value to society" were calculated. Categories were scaled according to their 'work likeness'. Correlation between the test retest scores was estimated using Spearman's rank order correlation coefficient.

**Phase III-** In the third phase of the study, 83 subjects (age group 18 to 25 unemployed) were taken conveniently from the community to check whether a relationship exists between meaningful time use and health. Subjects fulfilling the inclusion criteria were sampled using Snowball sampling. Inclusion criteria were the same as used in phase II.

Four domain wise subtotals of MOQ i.e. "activity category", "reason for doing the activity", "value to self" and "value to society", and two summary scores i.e. Physical component summary (PCS) and Mental component summary (MCS), of RAND-36 were obtained for each subject. Correlation of four subtotals of MOQ with two subtotals of RAND-36 was established. Correlation was calculated by using SPSS version 22.0 by Spearman's rank order correlation coefficient.

## RESULTS

Rasch modelling was used to evaluate:

- a. Construct validity,
- b. Rating scale validity, and
- c. Item Function and Person Performance Validity
- d. Statistical validity of the MOQ.





severity i.e. as higher in the column, more able it would be to perform harder item. Individuals numbered 13 and 14 had considerable ability between +2 to +3 (as mentioned in column one of the given figure), individuals numbered 5,3,15, 11, 17, 2, 1, 4 had ability between +1 to +2 (as mentioned in column one of the given figure) and individuals numbered 10, 16, 19, 9,12,18,20,7,8,6 had ability between 0 to +1. In this analysis, examinee ability was anchored to zero, so individual numbered 14 had ability level higher than the rest of the sample.

The third column in the given figure expressed item difficulty. The four items at different locations on the map, indicated different difficulty levels for individuals. Out of the four items, ‘reason for doing the activity’ was the most difficult item, followed by ‘value to self’ and ‘value to society’ and ‘Ist category’ (Activity category) was the easiest. Hence individual numbered 14 could perform the most difficult activity.

**B. Rating scale validity**

To prepare the MOQ data for analysis using FACETS software, scoring hierarchies were required for each scale. Activity categories were scaled according to their ‘work likeness’:

**I<sup>st</sup> Category**

- 0 (Doing nothing)
- 1. Inactive (Rest, Recreation/Leisure)
- 2. Active (Socializing, Caring for myself, Housework, Sport, Travel)
- 3. Work (Care for other, playing with children, Study, Work, unpaid work)

**II. Reason for doing the activity**

- 0, No Reason (I had nothing else to do)
- 1. (I had to do it, I wanted to do it)

**III. Value to self**

- 1. Not at all valuable
- 2. Not very valuable to me
- 3. Somewhat valuable to me
- 4. Quite valuable to me
- 5. Extremely valuable to me

**IV. Value to Society**

- 1. Not at all valuable
- 2. Not very valuable to society
- 3. Somewhat valuable to society
- 4. Quite valuable to society
- 5. Extremely valuable to society

Table 1 Rating Scale Statistics for Items

Item and category	Measure Score	Expected	Outfit	MnSq_RaschAndrich	Standard Error
				Threshold	of Threshold
<b>Value to Self</b>					
1. Not at all valuable	0.56	0.44	1.0		
2. Not very valuable	0.63	0.64	0.8	-0.93	0.42
3. Somewhat valuable	0.76	0.88	0.7	0.23	0.20
4. Quite valuable	1.08	1.19	0.5	-0.24	0.14
5. Extremely valuable	1.71	1.62	0.9	0.94	0.10
<b>Perceived Value to Society</b>					
0. Not at all valuable	-0.28	-0.07	0.7		
1. Not very valuable	0.03	0.14	0.6	-0.80	0.21
2. Somewhat valuable	0.33	0.39	0.7	0.01	0.13
3. Quite valuable	0.77	0.72	0.5	-0.17	0.11
4. Extremely valuable	1.20	1.14	1.0	0.99	0.11
<b>Activity Category</b>					
0. "Chilling"/Doing nothing	-0.37	-0.42	1.1		
1. Inactive	0.06	-0.10	1.4	-1.97	0.17
2. Active	0.32	0.31	1.2	0.40	0.10
3. Worklike	0.09*	0.77	1.7	1.57	0.150

Our results analyzed from tables 1 were:

- (a) Value to self: 2.34 progression;
- (b) Value to society: 1.97 progression;
- (c) Activity category: 3.94 progressions.

Hence, Rasch-Andrich thresholds progressed monotonically.

**C. Item Function and Person Performance Validity**

Item function and person performance validity allowed for the examination of whether the instrument was used in the way in which it was intended. If each individual interpreted each item in the same way, then data from each of the items and each of the people would show good fit to the model.

Rasch models presented two forms of fit statistics:

(a) Infit statistics and

(b) Outfit statistics

Presented as mean squares (fourth and sixth column of table 2) and standardized scores (fifth and seventh column of table 2). Infit or outfit mean squares of >2.0 may distort or degrade the model; mean squares of 1.5–2.0 did not degrade the model but added little to it; mean squares of 0.5–1.5 were helpful in the measurement process; and mean squares <0.5 were not degrading to the model but might lead to inflated reliability or separation statistics. The “optimal” range for standardized infit and outfit statistics is -2 to 2; however, this statistic was known to be vulnerable to inflation in the context of large sample sizes. [15]

Table 2. Statistics for Item Functioning

Item	Measure Score	Model Standard error	InfitMnSq	InfitZStd	Outfit mnSq	Outfit ZStd
Activity Category	-1.00	0.06	1.34	5.1	1.36	5.3
Perceived value to Society	0.43	0.05	0.82	-3.0	0.75	-3.9
Value to self	0.22	0.06	0.95	-0.6	0.79	-2.5
Reason for doing	1.21	0.15	0.96	-0.2	0.76	-1.6

Note. MnSq = mean square;

ZStd = standardized mean square.

\*Reported in log-odds units (logits).

In our study all items demonstrated acceptable fit with the Rasch model, as has been summarized in Table no. 2. All item infit and outfit mean square statistics fell within the range of 0.75-1.36, which was within the optimal range and was considered helpful in measurement.

Standardized infit and outfit statistics for ‘Value to self’ and ‘Reason for doing the activity’ items were within the recommended range of -2 to +2.

**D. Statistical Validity**

Rasch models also allowed for the examination of three important features of statistical validity:

1. Person separation index
2. Item reliability index
3. Person reliability indexes

Person and item separation indexes are conceptually equivalent to Cronbach’s alpha and report on the internal consistency of the instrument. [16] The person separation index is the capacity of the instrument to stratify people into meaningfully separate

groups. Separations should be no less than 2 and separations  $>3$  are considered “good.” [17] The person separation index (PSI) was 4.28 indicating that the instrument stratified people into approximately six statistically distinguishable groups (according to the equation  $(4PSI+1)/3$ ). [18] Reliability indexes of  $>0.81$  are considered “good” and those  $>0.91$  are considered “very good.” [17] The item reliability index was 0.99, suggesting excellent internal consistency. The person reliability index was also very good (0.99).

Reliability statistics were calculated by Cronbach's alpha. It is the most common measure of internal consistency ("reliability"). It is most commonly used when we have multiple Likert questions in a survey/questionnaire that form a scale and wish to determine if the scale is reliable.

As time use data did not conform to the assumptions required for parametric tests, comparisons were made using the Spearman's statistics.

Spearman's rank order correlation coefficient was computed to assess the relationship between the tests and retest values of “type of activity”, “reason for doing the activity”, “value to self” and “value to society”. The correlation  $r$  value requires both a magnitude and a direction of either positive or negative. The closer the  $r$  coefficient value approaches  $\pm 1$ , regardless of the direction, the stronger is the existing association indicating a more linear relationship between the two variables. [19]

Out of all four domains of MOQ, ‘value to society’ had highest internal consistency (0.962) and ‘value to self’ had highest correlation. ( $r=0.932$ )

Correlation between time use and health was estimated using MOQ and RAND-36. Spearman's rank order correlation coefficient was calculated between four domains of MOQ i.e. ‘type of activity’, ‘reason for doing the activity’, ‘value to self’ & ‘value to society’ and two summary scores of RAND-36 i.e. Physical component summary (PCS) & Mental component summary (MCS).

PCS consists of domains of ‘Physical function’, ‘Role limitation’, ‘Pain’ and ‘General health’ whereas MCS consists of ‘Vitality’, ‘Emotional well being’, ‘Role limitations’ and ‘Social functioning’.

The spearman's rank order correlation coefficient turned out to be significant for the correlation between ‘PCS’ and ‘Value to society’ whereas the correlation between PCS and other domains of MOQ was not significant. Similar pattern was seen with mental component scores as well. The value of correlation coefficient between MCS and value to self was  $r=0.382$  at sig. (2 tailed) = 0.000, which suggested positive correlation between the two. Whereas the correlation of MCS and type of activity, reason for activity & value to society were not significant.

It can be said that activities which are valuable to an individual have an impact on physical and mental status of the person, irrespective of type of activity or reason for doing the activity.

## DISCUSSION

The objective of this study was to establish validity and reliability of the Modified Occupational Questionnaire (MOQ) in 18-25-year-old unemployed population in Delhi-NCR.

MOQ had already been validated as a standardized tool to measure the meaningful time use in the age group 18 to 25 years in a different geographical area and it demonstrated good psychometric properties as an instrument for the measurement of the basic elements of meaningful time use. [20] External validation incorporates a range of methods for evaluating whether an instrument effectively measures what it purports to measure. In this study, external validity was established by estimating test-retest reliability and concurrent validity, which is determined by having participants complete, in addition to the instrument under review, a second measure that evaluates the same, or a closely related, construct. RAND-36 is a



measure of psychological and physical health, which was used in the study. [21]

RAND-36 was filled along with MOQ and correlations were estimated between physical and mental summary scores and time use. The high sleep hours by the unemployed could result from depression or be a behavioral response to having a low worth of time. The greater time devoted to home production and caring for others by the unemployed as compared to the employed is also consistent with the unemployed having a lower opportunity cost of time. [22] Also, the unemployed reported feeling less tired, sadder, and less happy than the employed over the course of the day. 'Watching television' and 'searching for a job' were associated with notably intense feelings of sadness for the unemployed. The patterns that emerged from this analysis suggest that the emotional experiences associated with unemployment were not entirely due to personality traits.

Results of our study indicated that person's ability was the extent to which participants filled their time with meaningful activity. In person distribution map, (Figure 1) it was analyzed that individuals numbered 13 and 14 had considerable ability to participate in a meaningful activity. They participated in the activities which were extremely valuable to society whereas individuals numbered 10 and 16 were not involved in activities which were of much value to the society.

## CONCLUSION

MOQ is a valid and reliable tool to assess meaningful time use in unemployed youth in Delhi-NCR.

### Limitations

As the sample size was less, so the test retest result sample cannot be generalized to the larger sample.

### Recommendations for further research

Further research is suggested on:

- Finding the meaningful time use using MOQ on a larger sample of unemployed youth, from different parts of the nation.

- Further evidence is needed for establishment of support services for unemployed individuals and activity based interventions for unemployed people.

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