Psychometric Properties of Career Needs Assessment for Sandwich Generation Workers Using Rasch Model Analysis

Rozita Jayus[1,*], Aqeel Khan[2], Adibah Abdul Latif[2], Mastura Mahfar[2], Ibnatul Jalilah Yusof[2] and Wan Norsyafiqah Arinah Binti Wan Nor Azmi[2]

[1] Universiti Malaysia Terengganu, 21030 Kuala Terengganu, Terengganu, Malaysia
[2] Universiti Teknologi Malaysia, 81310 Skudai Johor, Malaysia
*rozitaj@umt.edu.my

Abstract. This study examines the psychometric properties of the Career Needs Assessment for Sandwich Generation (CNASG), an instrument developed to assess career intervention needs among Malaysia's sandwich generation, a group of working adults responsible for both children and elderly dependents. The sample consisted of 155 nonacademic employees from a Malaysian public university identified as members of this demographic group. Participants completed an 11-item binary questionnaire. Data were analysed using the Rasch measurement model through WINSTEPS software (Version 5.71), assessing validity, reliability, item separation index, item polarity, principal component analysis (PCA), and differential item functioning (DIF) by gender and co-residence with elderly parents. Results showed high item reliability (0.99) and person reliability (0.86), indicating strong measurement consistency and distinct item differentiation. The PCA explained 70.9 percent of variance, supporting the unidimensionality of the construct. DIF analysis showed no bias across gender or living arrangements. Overall, findings confirm that the CNASG is a reliable and valid tool for identifying the unique career support needs of the Malaysian sandwich generation, emphasising tailored interventions to enhance their adaptability and resilience.

Keywords: Psychometric properties, career needs assessment, sandwich generation, Rasch analysis.

1 Introduction

The sandwich generation, consisting of individuals who simultaneously care for their children and their elderly parents, faces particular career challenges resulting from their dual caring responsibilities [1]-[6] This situation is exacerbated by the fact that both children and elder parents rarely take on caring responsibilities at the same time, especially when they compete with participation in the labour market [7]. The competing demands of these roles lead to increased stress levels and detrimental work-related outcomes as people have to cope with the complexity of being both caregivers

© The Author(s) 2026
C. Y. Lye et al. (eds.), *Proceedings of the Pacific Rim Objective Measurement Symposium (PROMS 2025)*, Atlantis Highlights in Social Sciences, Education and Humanities 56,
https://doi.org/10.2991/978-94-6239-834-4_27

and workers and often face family intergenerational stress, which jeopardises their identity as exemplary workers and reduces their work engagement [8]. The economic impact is also significant as caring responsibilities can lead to potential loss of income and increased unpaid work, especially in contexts such as Turkey where there is little institutional support [9]. Notwithstanding these adversities, re-sources such as optimism, self-efficacy, autonomy in the workplace and social support can mitigate the negative effects on well-being and career [10]. Furthermore, the dual caregiving responsibilities of the sandwich generation pose a significant career barrier, emphasising the need for supportive workplace interventions and societal reforms aimed at alleviating their burden and improving their overall quality of life [11]-[12].

Conversely, economic hardship is a significant problem as sandwich generation workers often incur costs to support both children and elder parents, a problem that may be exacerbated by the reduction in leisure time and the potential need for financial compensation for caring responsibilities [13]. In addition, psychological strain is another important challenge. Many caregivers suffer from exhaustion and depressive symptoms resulting from the simultaneous fulfilment of caring and career duties [14]. This emotional strain is exacerbated by the identity conflict that results from trying to fulfil the expectations of being a model employee while also being a dedicated family caregiver, resulting in lower career engagement and career satisfaction [8],[11]. Problems related to career advancement and time management are also prevalent, as the need to balance work and caring responsibilities often leads to a reduction in working hours or career sacrifices, and change their work commitments to meet family demands [15]. Coping mechanisms to manage these pressures include implementing role allocation strategies such as managing time and energy efficiently, maintaining social relationships and seeking support from career networks [16]. Despite these efforts, the sandwich generation workers continue to face significant obstacles, emphasising the need for supportive interventions and re-sources to mitigate their challenges and improve their overall well-being [7].

The obstacles faced by the sandwich generation workers, particularly in balancing work responsibilities and caring responsibilities, have a major impact on their career aspirations and advancement. Individuals from this population who simultaneously care for elderly parents and children often suffer from increased stress and adverse consequences in the workplace, including reduced career satisfaction and barriers to career advancement [8],[11]. The simultaneous caring role often leads to informal burnout, which manifests as physical and mental exhaustion and is significantly more pronounced among those who care for both parents and children than those who focus solely on childcare [14]. This burnout is closely linked to depressive symptoms, which make it even more difficult to achieve a work-life balance [11]. Despite these adversities, certain individuals adopt strategies to achieve role balance, such as optimising time and family management, maintaining social relationships and advocating for caregiver-friendly organisational policies [11],[16]. These strategies, together with resources such as career autonomy and social support, can mitigate the detrimental effects on well-being and career satisfaction [10]. Nonetheless, the need for

systemic support, which includes policy reform and workplace adjustments, is essential to address the unique challenges of the sandwich generation and promote their career development and work-life integration [11],[17]. Ultimately, understanding the unique needs of different groups is critical to formulating and implementing effective career development guidance initiatives that are tailored to individual and contextual dynamics.

The prevailing deficits in understanding the career demands of the sandwich generation workers that this research seeks to address include the insufficient in-depth examination of role fulfilment strategies, the impact of caregiving on health and overall well-being, and the impact of cultural and gender dynamics. Previous studies have shown that while women in the sandwich generation use a variety of approaches to balance their roles as mothers, caregivers and career, these methods are under-researched, particularly in terms of the mechanisms by which they achieve balance in these multiple roles [16]. In addition, dependence on and proximity to ageing parents has a significant impact on the support provided by the sandwich generation. However, the specific demands and barriers faced by these caregivers have yet to be fully explored [2]. Despite these hurdles, the presence of personal and career re-sources may mitigate adverse outcomes; however, the impact of the dual caring role on well-being remains only partially understood [10]. Ultimately, the function of adult children as primary caregivers for elder parents underscores the stress and un-met needs of the sandwich generation workers, requiring a better understanding of the complicated intergenerational dynamics [1]. Conversely, these gaps emphasise the need for more targeted research and interventions aimed at helping the sandwich generation manage their multifaceted caring responsibilities. Conducting a needs assessment is critical in formulating career counselling modules for workers as it helps to rationalise expenditure, document effectiveness and facilitate informed decisions about the services provided by career counsellors [18]-[19].

Analysing the Rasch model provides a solid framework for evaluating the psychometric characteristics of career choice tests that provide more accurate and relevant insights into individual career development needs. In contrast to conventional classical test theory, Rasch analysis, which is based on item response theory, enables a more accurate examination of rating scales by converting ordinal raw scores into interval-level measures, thereby adhering to essential measurement principles such as unidimensionality and linearity [20]-[23]. Furthermore, the ability of the Rasch model to provide item difficulty calibrations and individual ability metrics facilitates the identification of specific career development needs by indicating which items are easily agreeable and which items cause difficulties for respondents, as demonstrated in the evaluation of the Career Choice Self-Efficacy Scale (PCSES) [24]. This function is especially beneficial in career counselling and development, where the identification of precise strengths and weaknesses can enable targeted interventions.

In addition, Rasch analysis can also be used effectively with small sample sizes for initial evaluations, although caution is advised due to possible deviations in item

parameter estimates compared to larger samples [23],[25]. The application of the model goes beyond simple assessment as it enables probability, iteration and pre-diction, thus improving the assessment process by adapting items to individual ability levels, which is particularly beneficial in dynamic contexts such as career development where demands may change rapidly [26]-[27]. Furthermore, the Rasch mod-el's thorough approach to scoring scales and its ability to generate scale-free measures make it an independent tool for gaining meaningful insights into career development needs, ultimately leading to more effective methods of career counselling and planning.

This study seeks to substantiate the validity and reliability of the CNASG instrument through the application of Rasch analysis, thereby affirming its relevance for subsequent research endeavours. By establishing strong psychometric properties, this instrument can be used accurately in further studies focusing on analogous populations or relevant research areas. The use of Rasch analysis not only increases measurement accuracy, but also provides a framework for continuous improvement of the instrument based on empirical finding.

2 Methodology

The questionnaire, known as the CNASG, is designed to assess the career needs of individuals categorised as part of the sandwich generation, i.e. those who are caring for their children and their elderly parents at the same time as fulfilling their work commitments. This questionnaire was developed on the basis of extensive bibliographic research focussing on the identification of relevant psychological and career demands. It includes binary response questions to assess aspects related to stress reduction and career resilience that are crucial for this specific population. The study was conducted with a cohort of 155 non-academic employees from one of a public university in Malaysia. A purposive sampling technique was used, which is a pragmatic method given the defined target demographic.

3 Data Analysis

The Rasch Measurement Model is used to investigate the psychometric properties of the instrument [23],[27]. This framework is particularly effective in confirming that the instrument assesses a unidimensional construct and provides valid and reliable results. The Rasch Model assumes that all items in an instrument assess a single underlying trait or construct, thus confirming one-dimensionality [28]. This premise is underpinned by fit statistics that test whether the items match the expected measurement model [27]-[28]. Item and person reliability provides estimates of the reliability of both the items and the respondents and indicates the consistency with which the items assess the construct across different participants. Infit and outfit statistics are then used to assess the extent to which individual items fit the expectations of the model. Items that show inadequate fit may need to be revised or eliminated. In addition, the model assesses whether the items form a coherent hierarchy in terms of difficulty. This facilitates an

understanding of how the different items correspond to different levels of respondents' career needs. The results of the Rasch analysis include item maps (Wright maps) that visually represent the difficulty of the items in relation to respondents' ability levels and provide an insight into the completeness of the instrument in capturing the range of career needs. The analysis using the Rasch Measurement Model was conducted using WINSTEPS software version 5.71.

4 Research Instrument

The CNASG consisted of a series of 11 questions that required binary responses. Participants provided feedback on questions relating to programme prerequisites, awareness of coping strategies, sharing personal experiences with individuals in similar situations, the needs of professional counselling services, understanding of personal values, working practises, adaptability in the workplace, resilience in the career environment and spiritual insight. Non-academic employees' opinions on the needs assessment were analysed using percentages as the analysis included a binary yes/no scale. Incorporating yes/no items into needs assessment questionnaires offers numerous advantages. Firstly, they provide pertinent data to help researchers with dichotomous data and decision making [29]. Furthermore, the use of yes/no queries can be an important instrument for identifying critical variables that should be considered when developing an effective career development programme tailored to the target group [30]. Ultimately, these methods can be used to assess the needs of adult demographics to gain important insights for meeting those needs [31]-[32].

The sample was derived from the population through non-probability purposive sampling, a subjective sampling technique based on factors such as the objectives of the study, which means that not every person in the population has an equal or known chances of being part as the sample [33]-[34].

5 Results and Discussion

Table 1 presents the demographic characteristics of the 155 sandwich-generation employees who participated in the study at a public university in Malaysia. The sample was predominantly female, comprising 88 women (56.77%) and 67 men (43.23%), indicating that women were more strongly represented within this group in the setting examined. Participants were concentrated in the middle adult years: the largest age band was 36–40 years (42 participants, 27.10%), followed by 41–45 years (36 participants, 23.23%), with the remaining bands each accounting for between 5.81% and 15.48%. This reflects a broad spread of ages across the 26–60 year range.

Table 1. Descriptive statistics of sandwich generation (N = 155).

Characteristic	n	%
Gender		
Female	88	56.77
Male	67	43.23
Age		
26 - 30	9	5.81
31 - 35	24	15.48
36 - 40	42	27.10
41 - 45	36	23.23
46 - 50	19	12.26
51 - 55	16	10.32
56 - 60	9	5.81
Position		
Administrative and Professional	27	17.42
Support Staff	128	82.58
Status		
Married	147	94.84
Single Parent	8	5.16
No. of Children		
1	32	20.65
2	32	20.65
3	41	26.45
4 and more	43	27.75
Staying With		
Parents	16	10.32
Mother Only	35	22.58
Father Only	1	0.65
Parents in Law	5	3.23
Mother in Law Only	14	9.03
Father in Law Only	3	1.94
Not Staying With Any	81	52.26

Note. Percentages are calculated on the full sample; columns may not total 100 because of rounding. The number of children was not reported by seven participants (4.52%). All participants were Muslim (100%).

All participants were Muslim (100%), indicating a religiously homogeneous cohort. With regard to employment, the majority occupied support-staff positions (128 participants, 82.58%), and the remainder held administrative and professional roles (27 participants, 17.42%). The sample was overwhelmingly married (147 participants, 94.84%), whereas 8 participants (5.16%) were single parents. In terms of family size, households with four or more children constituted the single largest group (43 participants, 27.74%), followed closely by households with three children (41 participants, 26.45%); one child and two children were each reported by 32 participants (20.65%). Larger families were therefore the most prevalent, with households of three or more children together accounting for more than half of the sample (54.19%), a pattern consistent with the dual caregiving demands that characterise the sandwich generation. Living arrangements were varied: more than half of the participants (81 participants, 52.26%) did not reside with their elderly parents yet retained responsibility for their care, while the next most common arrangement was co-residence with one's mother (35 participants, 22.58%). Taken together, these results characterise the cohort as predominantly female, married, and Muslim, largely employed in support roles, and carrying substantial childcare responsibilities alongside the care of elderly parents. The next analysis is about the psychometric properties of the instrument.

Table 2 shows the summary statistics of the data. The reliability of the items is an impressive 0.99, indicating exceptional consistency. The item separation index is 9.27, which represents a high degree of precision in distinguishing item difficulties. The person reliability is 0.86, indicating a robust ability to differentiate between different ability levels of respondents. The person separation index is 2.45, which indicates that the sample can be reliably categorised into approximately two to three discrete ability strata. The mean item measure is 0.00, which is default as item difficulties mean in Rasch analysis. However, the mean value of the person measure is -0.16, which means that the respondents' abilities are on average slightly below the average difficulty of the items.

Table 2. Summary Statistics for Persons and Items

Measure	Persons (N = 155)	Items (N = 11)
Total Count	11	155
Mean Measure	-0.16	0
Real Standard Error (SE)	1.28	0.33
Standard Deviation (SD)	3.52	3.25
Separation Index	2.45	9.27
Reliability	0.86	0.99

Table 3 presents the summary fit statistics, reporting the mean infit and outfit values for persons and for items and thereby allowing the two facets to be compared against the expectations of the model. For persons, the infit and outfit MNSQ values were 0.87 and 1.09, with corresponding ZSTD values of −0.3 and 0.1; for items, the infit and outfit MNSQ values were 0.96 and 1.58, with ZSTD values of −0.5 and 0.6. The infit means for both facets fell well within the productive range, and every average ZSTD value remained within ±2.00, indicating that, overall, the data corresponded satisfactorily to the Rasch model. The marginally elevated mean item outfit MNSQ of 1.58 nonetheless suggested the presence of a limited number of unexpected responses, which prompted an examination of fit at the level of the individual item.

Table 3. Summary fit statistics for persons and items

Fit Statistic	Persons	Items
Infit Mean Square (MNSQ)	0.87	0.96
Infit Z-Standard (ZSTD)	-0.3	-0.5
Outfit Mean Square (MNSQ)	1.09	1.58
Outfit Z-Standard (ZSTD)	0.1	0.6

Note. Values are facet means generated by WINSTEPS. Persons and items fit the model when 0.50 ≤ MNSQ ≤ 1.50 [20] and −2.00 ≤ ZSTD ≤ +2.00 [23].

PCA is used to determine the consistency of the dimensions of an instrument. This characteristic of unidimensionality can outline a singular directional measurement of the instrument. Table 4 shows that the eigenvalue is 2.378 which is less than 3.0, indicates there is no second dimensions exist in the instrument. Linacre [28] proposes that in a principal component analysis (PCA) of the residuals within the Rasch model, the eigenvalue of the first contrast serves as an indicator of the strength of a possible secondary dimension; an eigenvalue below 3.0, together with more than 40 % of the raw variance explained by the measures, supports unidimensionality [23]. The empirical raw variance attributable to the measures indicates that 70.9 % of the variance is attributable to the measures (the primary dimension), which exceeds the expected 67.7 %. This finding indicates robust unidimensionality, meaning that most of the variance is captured by the intended construct. The unexplained variance also is less than 15% which is indicated the error happens in the data is not significant.

Table 4. Residual partial component analysis (PCA)

Variance Component	Eigenvalue	Observed (%)	Expected (%)
Total Raw Variance in Observations	37.8107	100	100
Raw Variance Explained by Measures	26.8107	70.9	67.7
Raw Variance Explained by Persons	13.4597	35.6	34
Raw Variance Explained by Items	13.3509	35.3	33.7
Raw Unexplained Variance (Total)	11	29.1	32.3
Unexplained Variance in 1st Contrast	2.0378	5.4	18.5
Unexplained Variance in 2nd Contrast	1.3661	3.6	12.4
Unexplained Variance in 3rd Contrast	1.3445	3.6	12.2
Unexplained Variance in 4th Contrast	1.2202	3.2	11.1
Unexplained Variance in 5th Contrast	1.0954	2.9	10

Next, Table 5 reports the fit statistics for each of the 11 items. The infit MNSQ values ranged from 0.59 to 1.41 and therefore fell entirely within the 0.50–1.50 criterion, confirming that every item fit the model on the information-weighted statistic, while all point-measure correlations were positive, ranging from 0.42 to 0.79, which indicates that each item discriminated in the intended direction. Two items, Q5 (outfit MNSQ = 3.71, ZSTD = 2.59) and Q9 (outfit MNSQ = 4.14, ZSTD = 3.05), produced elevated outfit values. Because the outfit statistic is unweighted and is consequently sensitive to a small number of unexpected responses from persons located far from an item's difficulty, and because both items are readily endorsed and situated at the easy end of the continuum (−5.47 and −2.96 logits, respectively), this elevation reflects a few off-target responses rather than any inadequacy in the items themselves; both items were accordingly retained. The negative ZSTD values recorded for Q1 and Q4 denote mild overfit, responses marginally more deterministic than the model anticipates, which does not degrade measurement and therefore presents no concern [20],[23]. Considered together, the summary and item-level results indicate that the CNASG fits the Rasch model satisfactorily, with all items demonstrating acceptable infit and appropriate discrimination [23].

Table 5. Item Fit Statistics

Item	Measure (logits)	S.E.	Infit		Outfit		PTMEA corr.
			MNSQ	ZSTD	MNSQ	ZSTD	
Q1	1.27	.26	.71	-2.20	.62	-.64	.76
Q2	.22	.27	.73	-1.94	.63	-.77	.79
Q3	.65	.26	1.02	.20	.87	-.10	.74
Q4	2.35	.27	.59	-3.37	.30	-1.21	.73
Q5	-5.47	.43	1.21	.81	3.71	2.59	.49
Q6	-1.53	.28	.88	-.73	1.03	.23	.75
Q7	-1.23	.27	.80	-1.27	1.41	.91	.77
Q8	-3.56	.30	1.11	.77	1.65	1.01	.62
Q9	-2.96	.29	1.09	.67	4.14	3.05	.63
Q10	4.52	.36	.99	.04	1.13	.41	.52
Q11	5.74	.50	1.41	1.16	1.88	1.27	.42

To establish that the CNASG operates equitably across the heterogeneous subgroups that constitute the target population, differential item functioning (DIF) was examined. DIF arises when respondents drawn from different groups but located at the same position on the latent continuum nonetheless display systematically different probabilities of endorsing an item; such an item introduces construct-irrelevant variance and is therefore regarded as biased [23]. Two grouping variables of substantive relevance to the present sample were tested: respondents' living arrangement (residing with elderly dependents versus not) and gender. Item invariance was evaluated against the dual criterion widely adopted in Rasch measurement, whereby an item is identified as exhibiting noteworthy DIF only when (a) the DIF contrast, the difference between the item difficulty estimates of the two groups, is at least 0.50 logits in absolute magnitude, and (b) the corresponding Rasch–Welch test is statistically significant, with $|t| \geq 2.00$ and $p < .05$ [28]. The conjoint requirement guards against over-interpreting differences that, although large in magnitude, are statistically unstable, a situation that frequently accompanies items of extreme difficulty or low endorsement.

DIF based on living arrangement is reported in Table 6. For the 11 items, the Rasch–Welch t statistics ranged from −1.46 to 1.43, all falling within the ±2.00 boundary, and the associated probabilities ranged from .150 to .934, each exceeding the .05 threshold. Although several items, most notably Q2, Q9, and Q10, produced DIF contrasts that surpassed 0.50 logits, none of these differences attained statistical significance. Accordingly, no item was flagged for DIF on the basis of living arrangement.

An analysis based on gender is presented in Table 6, and the same pattern emerged. The Rasch–Welch t statistics ranged from −1.43 to 1.16, again remaining within the ±2.00 boundary, with probabilities between .160 and .788. The largest magnitude was recorded for Q11, the most difficult item in the instrument, whose difficulty estimate differed by approximately 2.10 logits between the two gender groups. This contrast was nevertheless non-significant (t = −1.43 and 1.16; p = .160 and .251). The discrepancy is attributable to the item's very low endorsement rate (8 of 67 and 4 of 88 respondents), which inflated its standard errors (0.63 and 1.04) and rendered the observed contrast statistically unreliable. Because no item satisfied both elements of the DIF criterion, no item was flagged as exhibiting gender bias.

Table 6. Summary of differential item functioning for living arrangement and gender

Item	Living arrangement		Gender		
	DIF contrast (logits)	p	DIF contrast (logits)	p	DIF flagged
Q1	0.59	.435	-0.42	.561	No
Q2	1.08	.150	0.53	.462	No
Q3	-0.37	.609	0.66	.351	No
Q4	0.21	.776	0.52	.469	No
Q5	0.50	.669	0.68	.576	No
Q6	0.69	.376	-0.23	.755	No
Q7	-0.85	.280	-0.46	.528	No
Q8	-0.08	.912	-0.47	.555	No
Q9	-0.92	.256	0.50	.541	No
Q10	-1.60	.152	-0.65	.494	No
Q11	0.62	.660	-2.10	.160	No

The DIF contrasts and significance levels obtained for both grouping variables. Across all 22 item-by-group comparisons, not a single item met the conjoint criterion for substantial DIF; every contrast that approached or exceeded the 0.50-logit magnitude threshold was accompanied by a non-significant probability value. These findings provide consistent evidence that the CNASG is invariant across both living arrangement and gender: the items elicit equivalent response probabilities regardless of whether a respondent cohabits with elderly dependents or of the respondent's gender. The demonstrated absence of item bias reinforces the construct validity of the instrument and supports its fair and meaningful application across the diverse segments of Malaysia's sandwich generation workforce.

Fig. 1 shows the Wright Map; a visual tool used in Rasch analysis to visualise individual ability and item difficulty along a uniform logit scale. The vertical axis describes the logit scale and quantifies both individual ability (left) and item difficulty (right). The distribution of the "X "s indicates the range of individual abilities, with higher rankings on the scale signifying increased need or greater aptitude. The items (on the right) represented by "X "s indicate different levels of difficulty, with higher ranked items indicating lower agreement or greater complexity. The contrast between greatest need and greatest agreement is evident in the upper part of the map, where those with higher needs correspond to more challenging tasks. Conversely, those with lower needs are associated with less demanding tasks at the bottom of the map.

The standard deviations are highlighted, particularly around SD 3.25 and SD -3.25, highlighting key interpretation points where respondents within these areas may need tailored interventions, such as the career counselling indicated on the map. The mean (M) is shown at zero to provide a central reference point for both individual ability and item difficulty. The spread of individuals and items around this mean illustrates the variability in the requirements and agreement with the item. The item map indicates that the highlighted area suggests that respondents within this range could benefit from specific interventions. Ideally, a significant overlap between individual ability and task difficulty is desired to ensure that the assessment is appropriately focussed. This map shows whether the tasks present an appropriate level of challenge for the target group and where specific interventions may be warranted.

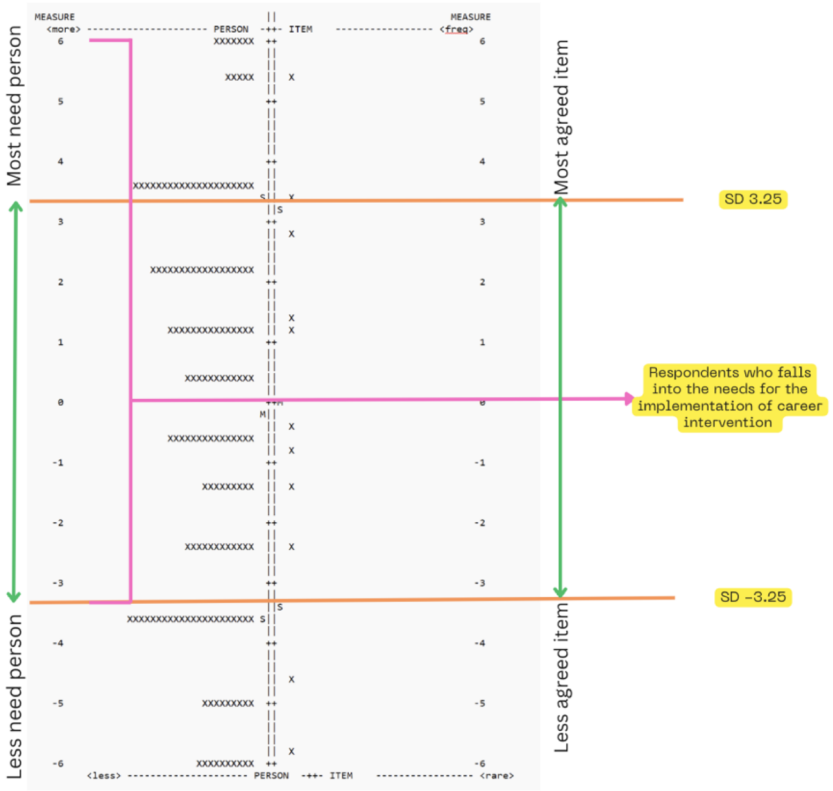


Fig. 1. Analyzing Career Needs Sandwich Generation based on Wright Map Approach

6 Conclusion

Research shows the CNASG instrument is specifically tailored to assess the particular career demands and obstacles faced by people categorised as part of the sandwich generation, i.e. people who are simultaneously caring for their elderly parents and their career. The development of the CNASG instrument is a crucial step towards a better understanding of the specific career needs of those belonging to the sandwich generation. This 11 items assessment tool has undergone a comprehensive evaluation using the Rasch Measurement Model, which guarantees a high degree of validity and reliability elements that are paramount to its effectiveness as a modern psychometric analysis. The Rasch Measurement Model provides an excellent framework for achieving this goal. It offers numerous advantages over conventional validation techniques, as it addresses both theoretical and practical issues in scale construction. Its ability to maintain unidimensionality, invariance and linear measurement make it an indispensable analysis in psychometric research. By utilising these properties, researchers are able to construct more sophisticated instruments that provide accurate

insights into the career demands of individuals in the sandwich generation, ultimately aiding the development of more effective interventions and support initiatives.

The CNASG instrument makes a significant contribution to the discipline by providing a comprehensive tool to promote research on the career development needs of the sandwich generation. Its application can extend beyond academic research and into practise, where it can guide interventions to support this population. By providing insight into their career needs, this tool can facilitate the development of targeted interventions and resources that address work-life balance issues and the dual caring responsibilities of the sandwich generation. The findings of this research highlighted the need for holistic career development modules and programmes specifically tailored to the sandwich generation. Such initiatives are essential to support them in effectively managing their work commitments alongside caring responsibilities. Future research should examine the implementation of these interventions and assess their impact on improving work-life balance for this population. Furthermore, additional validation studies could improve the generalizability of the CNASG instrument across different demographic groups, ensuring its relevance in different cultural contexts.

Disclosure of Interests. The authors have no competing interests to declare that are relevant to the content of this article.

References

1. Miller, D.: The sandwich generation: Adult children of the aging. Social Work 26(5), 419–423 (1981). https://doi.org/10.1093/sw/26.5.419
2. Nichols, L.S., Junk, V.W.: The sandwich generation: Dependency, proximity, and task assistance needs of parents. *Journal of Family and Economic Issues* 18, 299–326 (1997)
3. Abaya, C.: The sandwich generation: A survival guide. Circles of Love Publishing, GoEmerchant (2006). https://thesandwichgeneration.com
4. Broady, T.: The sandwich generation: Caring for oneself and others at home and work (Book review). International Journal of Care and Caring 3(2), 307–309 (2019). https://doi.org/10.1332/239788219x15579336972419
5. Turgeman-Lupo, K., Toker, S., Ben-Avi, N., Shenhar-Tsarfaty, S.: The depressive price of being a sandwich-generation caregiver. European Journal of Work and Organizational Psychology (2020). https://doi.org/10.1080/1359432x.2020.1762574
6. Noor, S., Isa, F.M.: Malaysian sandwich generation issues and challenges in elderly parents care. International and Multidisciplinary Journal of Social Sciences 9(3), 289–312 (2020). https://doi.org/10.17583/rimcis.2020.5277
7. Künemund, H.: Changing welfare states and the sandwich generation: Increasing burden for the next generation? International Journal of Ageing and Later Life (2006). https://doi.org/10.3384/ijal.1652-8670.061211
8. Dai, G., Zhang, L., Kay, A., Li, Y., Mao, M., Zhang, Q.: Family intergenerational stress: Concept exploration and development via coping and identity management. Journal of Occupational Health Psychology (2024). https://doi.org/10.1037/ocp0000388

9. Terkoğlu, Ö.İ., Memiş, E.: Impact of elderly care on sandwiched-generation women in Turkey. New Perspectives on Turkey (2022). https://doi.org/10.1017/npt.2022.12
10. Gervais, R.L., Millear, P.: Women's caring responsibilities as they age: Assessing the sandwich generation's satisfaction with life and well-being. Community, Work & Family (2024). https://doi.org/10.1080/13668803.2024.2364093
11. Shi, J., Jiang, C.: The negative spillover effect of sandwich-generation caregiving on employees' job satisfaction. Personnel Review (2024). https://doi.org/10.1108/pr-03-2023-0218
12. Lorenzo, A.D., Lattke, L., Zedda, E., Rabaglietti, E.: Resources and transversal competencies to reconcile child and parental responsibilities during COVID-19. Health Promotion Perspectives (2023). https://doi.org/10.34172/hpp.2023.21
13. Kim, Y., Jin, H.J.: Value of lost leisure among sandwich-generation women performing caregiving duties for older parents. Women's Studies International Forum (2024). https://doi.org/10.1016/j.wsif.2024.102974
14. Fenstermacher, E.A., Owsiany, M.T., Edelstein, B.A.: Informal caregiving burnout among the sandwich generation. Innovation in Aging (2022). https://doi.org/10.1093/geroni/igac059.3115
15. Daatland, S.O., Veenstra, M., Lima, I.A.Å.: Norwegian sandwiches: On the prevalence and consequences of family and work role squeezes over the life course. European Journal of Ageing (2010). https://doi.org/10.1007/s10433-010-0163-3
16. Evans, K., Millsteed, J., Richmond, J., Falkmer, M., Falkmer, T., Girdler, S.: Working sandwich-generation women utilise strategies within and between roles to achieve role balance. PLOS ONE (2016). https://doi.org/10.1371/journal.pone.0157469
17. Estioko, D.A.C., Haveria, M.M.A., Veloso, E.B.R., Teng-Calleja, M.: Experiences of intergenerational caregiving among women belonging to the sandwich generation: Evidence from the Philippines. Journal of Intergenerational Relationships (2022). https://doi.org/10.1080/15350770.2022.2053771
18. Krumboltz, J.D., Vidalakis, N.K.: Expanding learning opportunities using career assessments. Journal of Career Assessment 8(4), 315–327 (2000)
19. Jayus, R., Khan, A., Abdul Latiff, A., Mahfar, M., Pathath, A.W.: Needs analysis on the module development for working sandwich generation in public universities in Malaysia. South Eastern European Journal of Public Health (2024). https://doi.org/10.70135/seejph.vi.1405
20. Linacre, J.M.: What do infit and outfit, mean-square and standardized mean? Rasch Measurement Transactions 16(2), 878 (2002)
21. Zile-Tamsen, C.V.: Using Rasch analysis to inform rating scale development. Research in Higher Education (2017). https://doi.org/10.1007/s11162-017-9448-0
22. Tesio, L., Caronni, A., Kumbhare, D., Scarano, S.: Interpreting results from Rasch analysis I: The "most likely" measures. Disability and Rehabilitation (2023). https://doi.org/10.1080/09638288.2023.2169771
23. Bond, T.G., Yan, Z., Heene, M.: Applying the Rasch model: Fundamental measurement in the human sciences. 4th edn. Routledge, New York (2020). https://doi.org/10.4324/9780429030499
24. Ambiel, R.A.M., Noronha, A.P.P., Carvalho, L.F.: Analysis of the professional choice self-efficacy scale using the Rasch–Andrich rating scale model. International Journal for Educational and Vocational Guidance (2015). https://doi.org/10.1007/s10775-015-9293-7
25. Chen, W.-H., Lenderking, W.R., Jin, Y., Wyrwich, K.W., Gelhorn, H.L., Revicki, D.A.: Is Rasch model analysis applicable in small sample size pilot studies for assessing item

characteristics? Quality of Life Research (2014). https://doi.org/10.1007/s11136-013-0487-5
26. Velozo, C.A., Kielhofner, G., Lai, J.S.: The use of Rasch analysis to produce scale-free measurement of functional ability. American Journal of Occupational Therapy (1999). https://doi.org/10.5014/ajot.53.1.83
27. Bond, T.G., Fox, C.M.: Applying the Rasch model: Fundamental measurement in the human sciences. Psychology Press, New York (2013)
28. Linacre, J.M.: A user's guide to WINSTEPS® and MINISTEP. Winsteps, Chicago (2016)
29. Watkins, E.L., Harlan, C., Eng, E., Gansky, S.A., Gehan, D., Larson, K.: Assessing the effectiveness of lay health advisors with migrant farmworkers. Family & Community Health 16(4), 72–87 (1994)
30. Robinson, D., Pearce, K.F., Preisser, J.S., Dugan, E., Suggs, P.K., Cohen, S.J.: Relationship between patient reports of urinary incontinence symptoms and quality of life measures. Obstetrics & Gynecology 91(2), 224–228 (1998)
31. Sloane, P.D., Zimmerman, S., D'Souza, M.F.: What will long-term care be like in 2040? North Carolina Medical Journal 75(5), 326–330 (2014)
32. Souza, B.: A needs assessment to explore the professional development of early childhood practitioners with online resources (Unpublished report) (2014)
33. Wu, C., Thompson, M.E.: Sampling theory and practice. Springer, Cham (2020)
34. Vehovar, V., Toepoel, V., Steinmetz, S., Wolf, C., Joye, D., Smith, T.W., Fu, Y.: The SAGE handbook of survey methodology. SAGE, London (2016)
35. Sass, C., Griffiths, A.W., Shoesmith, E., Charura, D., Nicholson, P.: Delivering effective counselling for people with dementia and their families. Counselling and Psychotherapy Research 22(1), 175–186 (2022)
36. Scheuermann, J.S., Gräßel, E., Pendergrass, A.: Predictors of expressed, felt, and normative needs for informal caregiver counselling. Zeitschrift für Gerontologie und Geriatrie 56(5), 395–401 (2023)
37. Liu, X.: Using and developing measurement instruments in science education: A Rasch modeling approach. 2nd edn. Information Age Publishing, Charlotte, NC (2020)

Open Access This chapter is licensed under the terms of the Creative Commons Attribution-NonCommercial 4.0 International License (http://creativecommons.org/licenses/by-nc/4.0/), which permits any noncommercial use, sharing, adaptation, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons license and indicate if changes were made.

The images or other third party material in this chapter are included in the chapter's Creative Commons license, unless indicated otherwise in a credit line to the material. If material is not included in the chapter's Creative Commons license and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder.

