Outcomes Star™ Psychometric Factsheet: Pathway Star™

Author: Dr Anna Good; Triangle Consulting Social Enterprise Ltd
2023

Background

The Pathway Star was developed by Triangle with service providers and commissioners from Liverpool City Region Combined Authority and published in 2019.

It is designed for use with people who need considerable support if they are to move towards work. This includes people currently facing significant barriers to work, such as health or housing problems, substance misuse, crime, domestic abuse, family culture (including generations of people not in work) or household finances. It is likely to be most useful for services supporting people as they start to make changes, such as leaving the house more, up to the stage when they can engage in mainstream employment services where that is a realistic option, or when they have found alternatives to work if it is not realistic for them. People who are already able to apply for work or training are advised to use the Work Star.

More information about the development of the Pathway Star, including initial validation of the pilot version can be found in the Development report (MacKeith, Burns, Goodbrand, Greaves & Good, 2019) and the overall principles behind the development of all versions of the Outcomes Star are described in MacKeith (2011).

Method and analytic strategy

This validation on the published version follows the initial validation of the pilot version, which is included in the Development Report.

Pathway Star data routinely collected by an organisation supporting people with learning difficulties and autism eight organisations was analysed by Triangle to test the Star's validity as an outcomes measurement tool. In total, data from 199 service users was included, all of whom had a second review Star reading.

A full explanation of the analytic strategy is provided in the accompanying document – Outcomes Star Psychometric Factsheets: Overview.

Results

> ***Does it make sense for the different outcome areas of the Star to be included in the same tool?***
>
> **Factor Structure:** The Kaiser-Meyer-Olkin value exceeded the recommended minimum value of 0.60 (Kaiser 1970, 1974) and a significant Bartlett's Test of Sphericity (Bartlett, 1954) supported the suitability of the data for factor analysis. This analysis yielded a unidimensional factor structure explaining 50.2% of the variance in the data.
>
> **Internal Consistency:** Internal consistency was very good (Cronbach's α =.78).

> **Is each outcome area measuring a unique aspect of the service user's situation?**
>
> **Item redundancy:** All inter-item correlations were below the 0.7 threshold indicating no item redundancy.

> **Does the Star detect change occurring within a service?**
>
> **Responsiveness to change:** After excluding those who could not move forward due to starting at 5, the Wilcoxon Signed Rank Test revealed a statistically significant increase in all outcome areas, with medium-large effect sizes in seven of the eight areas and a small-medium effect size in the Money area (see Table 2). The results including all 199 service users are shown in Table 3.

> **Does the Star measure what it sets out to measure?**
>
> **Known groups validity:** A simple linear regression showed that the number of outcome areas in final Star reading that were high on the Journey of Change (defined as stages 4 or 5 on the 5-point scale) was higher for service users who had entered employment had been secured, $b = .1.62$, $t(145) = 4.38$, $p <.001$. A significant regression equation was found, ($F(1,145)= 19.22$, $p <.001$, with an R^2 of .12.
>
> In addition, chi-square tests were conducted look at whether those who had entered employment had a greater number of outcome areas with high readings and in six of the eight outcome areas, were significantly more likely to have progressed from low to high readings. There were statistically significant associations in the expected direction for six of the eight outcome areas, as shown in Table 4.

Conclusions

The results of these initial analyses were encouraging and suggest that the Pathway Star is a responsive unidimensional measurement tool, which relates to hard outcomes as expected.

External research about the Star as an outcomes and keywork measure can be found on our website: http://www.outcomesstar.org.uk/about-the-star/evidence-and-research/research-library/#all

Table 1. Correlation matrix for outcome areas

	1	2	3	4	5	6	7
1 Skills	-	-	-	-	-	-	-
2 Stability at home	.13	-	-	-	-	-	-
3 Money	.28	.28	-	-	-	-	-
4 Healthy lifestyle	.32	.42	.23	-	-	-	-
5 Emotional well-being	.36	.30	.26	.32	-	-	-
6 Family and relationships	.40	.53	.30	.44	.40	-	-
7 Friends and connections	.30	.26	.21	.28	.46	.48	-
8 Confidence and aspirations	.46	.14	.24	.23	.46	.45	.35

Table 2. Responsiveness of the Pathway Star for those starting at 1-4

	First Star median	Final Star median	z	Effect size r^1	n^2
Skills	3	4	7.05***	0.37	185
Stability at home	3	4	5.09*	0.40	80
Money	3	4	3.89***	0.21	167
Healthy lifestyle	3	4	6.25***	0.36	152
Emotional well-being	3	4	6.54***	0.36	169
Family and relationships	3	4	5.87***	0.40	109
Friends and connections	3	4	5.49***	0.37	109
Confidence and aspirations	3	4	6.54***	0.34	184

*p <.05 ***p <.001
[1] Cohen provided rules of thumb for interpreting these effect sizes, suggesting that an r of .1 represents a 'small' effect size, .3 represents a 'medium' effect size and .5 represents a 'large' effect size
[2] Excluding those who started at 5 so could not progress

Table 3. Responsiveness of the Pathway Star for all service users (N = 199)

	First Star median	Final Star median	z	Effect size r^1
Skills	3	4	-6.46***	0.32
Stability at home	4	5	-2.16*	0.11
Money	3	4	-3.45**	0.17
Healthy lifestyle	4	4	-4.14***	0.21
Emotional well-being	3	4	-4.25***	0.21
Family and relationships	4	5	-2.83**	0.14
Friends and connections	3	4	-4.74***	0.24
Confidence and aspirations	3	4	-5.67***	0.28

*p <.05 **p <.005 ***p <.001
[1] Cohen provided rules of thumb for interpreting these effect sizes, suggesting that an r of .1 represents a 'small' effect size, .3 represents a 'medium' effect size and .5 represents a 'large' effect size

Table 4. Pathway Star progression to 4+ as a predictor of employment (Chi-square tests)

	χ^2	*p*	*Cramer's V*[1]	*n*[2]
Skills	20.12	<.001	.39	132
Stability at home	10.85	.001	.49	46
Money	9.64	.002	.29	118
Healthy lifestyle	4.87	.028	.23	96
Emotional well-being	2.12	.10	.13	120
Family and relationships	12.51	<.001	.48	55
Friends and connections	1.40	.26	.11	115
Confidence and aspirations	10.35	.001	.28	132

[1] There are varying thresholds for interpreting Cramer's V, but < 0.3 is often considered a small effect size, 0.3-0.5 medium and >0.5 large.

[2] The number included varies because the sample is restricted to those who began at stages 1-3.

References

Bartlett, M. S. (1954). A note on the multiplying factors for various χ 2 approximations. *Journal of the Royal Statistical Society. Series B (Methodological)*, 296-298.

Good, A., & MacKeith, J. (2021). Psychometric validation of the Homelessness Star. *Journal of Social Distress and Homelessness*, 1-10.

Kaiser, H.F. (1970). A second generation little jiffy. Psychometrika, Vol. 35, pp. 401-15.

Kaiser, H.F. (1974). An index of factorial simplicity. Psychometrika, Vol. 39, pp. 31-6.

MacKeith, J., (2014). Assessing the reliability of the Outcomes Star in research and practice. *Housing, Care and Support*, 17(4), 188-197.

MacKeith, J., Burns, S., Goodbrand, S., Good, A. & Greaves, S. (2019). The Pathway Star Development Report, Brighton: Triangle Consulting.