

Development of a brief form of the Life Skills Profile: the LSP-20

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Objective: To develop a brief form of the Life Skills Profile (LSP) that incorporates all five subscales of the full form.

Method: A new short form of the LSP (LSP-20) was developed to incorporate all five subscales of the full form. The LSP-20 development was based on a reanalysis of data from previously published studies. These data sets were also reanalysed to determine any differential effects of numbers and percentages of items in the LSP-39, LSP-16 and LSP-20, comparability of scores of the different forms, of test-retest and interrater reliability, and validity of the LSP-20 by comparison with the Positive and Negative Syndrome Scale (PANSS).

Results: A twenty-item short form of the LSP-39 (LSP-20) is described which retains 16 items of an earlier short form but which also reproduces the subscale concerned with disability associated with positive psychotic phenomena. The subscales correlated highly with their counterparts in the full form, interrater and test-retest reliabilities were comparable, and concurrent validity was good.

Conclusions: The LSP-20 is a brief form of a widely used instrument that offers equivalent coverage to the full form with sound empirical properties, though unlike the LSP-39, it can be scored in the direction of impairments or strengths. Therefore the LSP-20 may be more suited to routine service disability and aggregated outcome assessments, but less suited than the LSP-39 to detailed research, or to interactive use as part of service user's individual care planning and review.

Key words: assessment, disability, functioning, psychosis, severe mental illness.

Australian and New Zealand Journal of Psychiatry 2001; 35:677-683

The Life Skills Profile (LSP-39), developed by Rosen *et al.* [1], is a 39-item instrument assessing functioning in persons with severe mental illnesses; it comprises five subscales: Communication, Social Contact, Non-turbulence,

Self-care and Responsibility. It was first designed for use with persons with a severe mental illness, as exemplified by schizophrenia of any type and at any phase of the disorder. The LSP-39 has since been widely used to assess social disability in a number of other severe, prolonged or relapsing mental illnesses that generate disability, including affective and organic disorder.

The LSP-39 has a number of features that make it suitable to use for many purposes and in many settings. Firstly, it may be used with a wide range of mental disorders, not solely with schizophrenia for which it was initially developed. It is easy to use in that it takes a short time to complete, there are no special training requirements, and the items are free of psychiatric jargon. Ratings are based on observed behaviours, so no clinical

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Received 14 February 2001; revised 4 April 2001; accepted 11 April 2001.

interpretation is called for. The scoring emphasizes functional strengths rather than weaknesses, consistent with contemporary rehabilitation and recovery approaches. The psychometric properties of the LSP-39 have been closely studied [2,3] and the instrument has been used in several translations around the world. Following its development, Trauer *et al.* [3] proposed a slightly different set of subscales, namely Bizarre, Withdrawal, Antisocial, Self-care and Compliance. The correlations with the original subscales were 0.85, 0.94, 0.98, 0.97 and 0.90 respectively. The following year, a major Australian study of psychiatric classification and casemix [4] sought a short form of the LSP-39 as it was judged that another instrument used in this study, the Health of the Nation Outcome Scales (HoNOS) [5], would adequately cover the content of the LSP-39's Communication subscale (or Bizarre, as it appeared in the Trauer *et al.* [3] set). The originators of the LSP-39 then developed a 16-item short form (henceforth LSP-16) for this purpose. The LSP-16 uses the Trauer *et al.* subscale descriptors, and is negatively scored (i.e. higher scores are indicative of poorer functioning), to maintain consistency with the other instruments used in the casemix study.

Contemporary implementations of outcome measurement in public mental health services in Australia [6,7] require the use of the HoNOS and LSP-16 as part of a suite of outcome instruments. Given that the majority of patients in these services have a principal psychiatric diagnosis of psychosis, it is noteworthy that the HoNOS and LSP-16 have only one item between them (HoNOS item six) that addresses psychotic phenomena specifically. The present work details the development of a new short form of the LSP-39 that restores the omitted Communication subscale. The inclusion of the omitted subscale would produce a more balanced representation of the items of the LSP-39 and will provide greatly improved coverage of specifically psychotic problems which contribute significantly to disability.

Method

The LSP-16 contained items selected as having the best empirical characteristics of all the items in the four relevant subscales. In order to maintain compatibility with the LSP-16, which is already in routine use in certain Victorian mental health agencies, it was determined that the new short form should contain all items comprising the LSP-16 and could use the same, negatively scored, subscales as described by Trauer *et al.* [3]. The main task therefore was to add items to the LSP-16 that would yield the Bizarre subscale. The development of the new short form is based on a reanalysis of data previously used in the original development of the LSP-39 [1], a study of its test-retest reliability [2], the development of the revised subscales [3], and a study of long-stay hospital inpatients resettled into the community [8]. The numbers of patients involved in these four studies were 128, 48, 200 and 99 respectively.

Results

LSP-20

By adding in the three LSP-39 Bizarre items (items 8, 9 and 11) the full Bizarre subscale is represented. Using the Trauer *et al.* [3] data, all the correlations between the Trauer *et al.* subscales and total score with the corresponding LSP-16 subscales and the latter with items 8, 9 and 11 added were 0.90 or greater except for Withdrawal which was 0.84. Withdrawal comprises eight items in the LSP-39, four of which are in LSP-16. Four analyses were run, adding one of the four omitted items (items 7, 20, 21 and 22) each time, and only item 21 made a significant improvement, pushing the correlation up to 0.92. Item 21, regarding the person's interests, is part of the Social Contact [1] or Withdrawal [3] subscales. The internal consistencies (the extent to which the items comprising a scale correlate with each other; Cronbach's coefficient alpha) of the subscales Bizarre, Withdrawal, Antisocial, Self-care and Compliance and the total score of the LSP-20 were 0.71, 0.78, 0.82, 0.82, 0.81 and 0.90, respectively.

Thus, the LSP-20 comprises the 16 items of the LSP-16 (items 1, 3, 4, 10, 14–19, 25, 26, 29, 34, 38 and 39) in the LSP-39 plus items 8, 9, 11 and 21 in the LSP-39.

Table 1 displays the allocation of items to the several forms of the instrument.

Comparability of scores with the LSP-39 and LSP-16

Table 2 shows the correlations of the LSP-39 subscale and total scores with those of the LSP-16 and LSP-20.

In addition to the correlations, it is important to determine whether the LSP-20 and LSP-16 subscales produce similar *absolute values* to the LSP-39, because different items, and numbers of items, contribute to the subscales. Since most of the subscales of the shorter forms are based on fewer items than those in the LSP-39, comparisons must be based on mean subscale values. Although the LSP-20 can be scored in the negative direction, analyses involving the LSP-39 have retained the 'strengths' scoring to preserve comparability. The mean ratings on the three subscales that have changed (Withdrawal, Antisocial and Self-care) and the total score are all statistically significantly lower ($t \geq 5.83$, $df = 198$, $p < 0.001$) in the LSP-20 than in the LSP-39; the mean ratings on Bizarre and Compliance, which have not changed, are of course identical.

It is apparent that where differences exist between the long and short form subscales they are all in the direction of the short form producing lower (poorer functioning) mean ratings. The lower subscale ratings lead the total score to be lower as well. The reason for this is that items vary in how much they attract low (poorer functioning) or high (better functioning) ratings. If the short forms have proportionately more of the low-rating items then the pro-rated totals will be lower than the total based on all 39 items. It is necessary therefore to examine the distribution of items across subscales in the various forms of the instrument. The mean LSP-39 item scores within subscales for both the Trauer *et al.* [3] and Parker *et al.* [2] studies are shown in Table 3, and the percentage of items contributing to each subscale in Table 4.

The different numbers, and proportions, of items in subscales in the three versions make a difference to the total scores because the mean item ratings within subscales are different. It is notable that mean

Table 1. Allocation of LSP-39 items to the LSP-39, LSP-16 and LSP-20

No.	Item	LSP-39 (Rosen)	LSP-39 (Trauer)	LSP-16 (Trauer)	LSP-20 (Trauer)
1	Does this person generally have any difficulty with initiating and responding to conversation?	Communic	Withdrawal	Withdrawal	Withdrawal
2	Does this person generally intrude or burst in on others' conversation (e.g. interrupts you when you are talking)?	Communic	Antisocial		
3	Does this person generally withdraw from social contact?	Social Cont	Withdrawal	Withdrawal	Withdrawal
4	Does this person generally show warmth to others?	Social Cont	Withdrawal	Withdrawal	Withdrawal
5	Is this person generally angry or prickly towards others?	Non-turb	Antisocial		
6	Does this person generally take offence readily?	Non-turb	Antisocial		
7	Does this person generally make eye contact with others when in conversation?	Communic	Withdrawal		
8	Is it generally difficult to understand this person because of the way he or she speaks (e.g. jumbled, garbled or disordered)?	Communic	Bizarre		Bizarre
9	Does this person generally talk about odd or strange ideas?	Communic	Bizarre		Bizarre
10	Is this person generally well groomed (e.g. neatly dressed, hair combed)?	Self-care	Self-care	Self-care	Self-care
11	Is this person's appearance (facial appearance, gestures) generally appropriate to his or her surroundings?	Communic	Bizarre		Bizarre
12	Does this person wash himself or herself without reminding?	Self-care	Self-care		
13	Does this person generally have an offensive smell (e.g. due to body, breath or clothes)?	Self-care	Self-care		
14	Does this person wear clean clothes generally, or ensure they are cleaned if dirty?	Self-care	Self-care	Self-care	Self-care
15	Does this person generally neglect her or his physical health?	Self-care	Self-care	Self-care	Self-care
16	Does this person generally maintain an adequate diet?	Self-care	Self-care	Self-care	Self-care
17	Does this person generally look after and take her or his own prescribed medication (or attend for prescribed injections on time) without reminding?	Responsib	Compliance	Compliance	Compliance
18	Is this person willing to take psychiatric medication when prescribed by a doctor?	Responsib	Compliance	Compliance	Compliance
19	Does this person co-operate with health services (e.g. doctors and/or other health workers)?	Responsib	Compliance	Compliance	Compliance
20	Is this person generally inactive (e.g. spends most of the time sitting or standing around doing nothing)?	Social Cont	Withdrawal		
21	Does this person generally have definite interests (e.g. hobbies, sports, activities) in which he or she is involved regularly?	Social Cont	Withdrawal		Withdrawal
22	Does this person attend any social organization (e.g. church, club, or interest group but excluding psychiatric therapy groups)?	Social Cont	Withdrawal		
23	Can this person generally prepare (if needed) her or his own food/meals?	Self-care	Self-care		

Table 1. Continued

No.	Item question	LSP-39 (Rosen)	LSP-39 (Trauer)	LSP-16 (Trauer)	LSP-20 (Trauer)
24	Can this person generally budget (if needed) to live within his or her means?	Self-care	Self-care		
25	Does this person generally have problems (e.g. friction, avoidance) living with others in the household?	Non-turb	Antisocial	Antisocial	Antisocial
26	What sort of work is this person generally capable of (even if unemployed, retired or doing unpaid domestic duties)?	Self-care	Self-care	Self-care	Self-care
27	Does this person behave recklessly (e.g. ignoring traffic when crossing the road)?	Non-turb	Antisocial		
28	Does this person destroy property?	Non-turb	Antisocial		
29	Does this person behave offensively (includes sexual behaviour)?	Non-turb	Antisocial	Antisocial	Antisocial
30	Does this person have habits or behaviours that most people find unsociable (e.g. spitting, leaving lighted cigarette butts around, messing up the toilet, messy eating)?	Self-care	Antisocial		
31	Does this person lose personal property?	Responsib	Self-care		
32	Does this person invade others' space (rooms, personal belongings)?	Non-turb	Antisocial		
33	Does this person take things which are not his or hers?	Responsib	Antisocial		
34	Is this person violent to others?	Non-turb	Antisocial	Antisocial	Antisocial
35	Is this person violent to him or her self?	Non-turb	Antisocial		
36	Does this person get into trouble with the police?	Non-turb	Antisocial		
37	Does this person abuse alcohol or other drugs?	Non-turb	Antisocial		
38	Does this person behave irresponsibly?	Non-turb	Antisocial	Antisocial	Antisocial
39	Does this person generally make and/or keep up friendships?	Social Cont	Withdrawal	Withdrawal	Withdrawal

Subscale names are from the authors in parentheses. Communic, Communication; Social Cont, Social Contact; Non-turb, Non-turbulence; Responsib, Responsibility.

Table 2. Correlations of the Trauer LSP-39 subscale and total scores with short forms in Trauer et al. [3]

	LSP-16	LSP-20
Bizarre	–	1.00
Withdrawal	0.84	0.92
Antisocial	0.94	0.94
Self-care	0.95	0.95
Compliance	1.00	1.00
Total	0.95	0.96

Table 3. Mean LSP-39 subscale and total scores in Trauer et al. [3] and Parker et al. [2] data sets

	Trauer et al.	Parker et al.
Bizarre	3.31	3.10
Withdrawal	2.63	2.57
Antisocial	3.24	3.27
Self-care	3.12	3.23
Compliance	2.98	3.00
Total	3.08	3.08

Withdrawal ratings are the lowest of the five subscales, while Antisocial is the highest or second highest. In both data sets, the mean Withdrawal ratings are significantly lower than those of the other four subscales ($t \geq 6.58$, $df \geq 151$, $P < 0.001$). Conversely, the mean score

of Bizarre, the subscale omitted from the LSP-16, is comparatively high.

The differing proportions of subscales to the total, and the differing mean ratings of subscales, have a predictable effect on pro-rated total

scores. The LSP-16 has relatively fewer of the comparatively high-rating Bizarre and Antisocial items, and relatively more of the comparatively low-rating Withdrawal items. This leads the pro-rated total to be lower than that of the LSP-39. The distribution of items to subscales in the LSP-20, with Bizarre restored, are closer to the LSP-39. However, it still has more of the comparatively low-rating Withdrawal items, so the pro-rated total scores are also lower than that of the LSP-39.

Test–retest reliability

For the purpose of assessing test–retest reliability (the stability of ratings over time), we used the data of Parker *et al.* [2]. All cases that were tested twice, irrespective of whether by the same rater, have been included. The interval between the ratings was 4 weeks. Table 5 shows the time 1 and time 2 means of the subscales of LSP-20, and the intraclass correlations between them. The number of cases involved in these analyses is 46.

Table 5 shows that the subscale and total score means are very similar at the two test occasions, with the exception of Compliance, which was significantly higher on the second occasion. The intraclass correlations are high to very high, and are very similar to the corresponding values for the original subscales and total score as reported by Parker *et al.* [2].

Interrater reliability

When the Trauer *et al.* [3] data were being obtained, 22 of the patients were rated twice by separate clinicians. These ratings were conducted an average of 13.1 days apart. The 22 pairs of ratings were

Table 4. Numbers and percentages of items in the LSP-39, LSP-16, and LSP-20

	LSP-39 n (%)	LSP-16 n (%)	LSP-20 n (%)
Bizarre	3 (8)	0 (0)	3 (15)
Withdrawal	8 (20)	4 (25)	5 (25)
Antisocial	15 (38)	4 (25)	4 (20)
Self-care	10 (26)	5 (31)	5 (25)
Compliance	3 (8)	3 (19)	3 (15)
	39 (100)	16 (100)	20 (100)

Table 5. Comparison of LSP-20 subscale and total scores between time 1 and time 2

	Pre mean	Post mean	t	p	ICC
Antisocial	13.04	13.24	1.35	0.18	0.89
Compliance	9.54	9.96	2.86	< 0.01	0.85
Self-care	15.54	15.76	1.20	0.24	0.94
Bizarre	9.80	9.52	1.67	0.10	0.76
Withdrawal	12.37	12.33	0.21	0.84	0.90
Total	60.30	60.80	1.06	0.30	0.93

ICC, intraclass correlation coefficient.

used to assess interrater reliability (the degree to which different raters agree in their rating of the same patients), and the results are displayed in Table 6.

The interrater reliabilities of the Compliance and Bizarre subscales, which are identical in both versions, have not changed. The interrater reliabilities of Withdrawal and the total score are very similar, while the interrater reliabilities of Self-care and Antisocial are higher and lower, respectively.

Fleiss and Cohen [9] demonstrated that intraclass correlation is equivalent to weighted kappa as a measure of reliability, and Landis and Koch [10] provided ‘rules of thumb’ for the interpretation of kappa: for ranges of kappa of 0.21–0.40, 0.41–0.60, 0.61–0.80 and 0.81–1.00 they suggested that the strengths of agreement were ‘fair’, ‘moderate’, ‘substantial’ and ‘almost perfect’ respectively. It is apparent that the interrater reliabilities of the subscale scores and the total score are moderate to substantial.

Validity

Most of the patients in the study by Trauer *et al.* [8] were assessed contemporaneously on the Positive and Negative Syndrome Scale (PANSS [11]). Concurrent validity (the extent to which ratings correlate with concurrent measures of the same or related phenomena) was studied by examining the correlations of the LSP-20 scores with PANSS items and scale scores. Both the LSP-20 and the PANSS are negatively scored (i.e. high ratings indicate greater dysfunction or more severe symptoms), so correlations are expected to be positive. In examining correlations between PANSS items and LSP-20 scores, only coefficients of 0.30 or greater will be considered, in view of the increased risk of type I errors.

The LSP-20 Withdrawal subscale correlated in the expected direction with five of the seven PANSS Negative items (emotional withdrawal, 0.37; rapport, 0.57; passive social withdrawal, 0.38; conversation, 0.57; and stereotypy, 0.35), one of the Positive items (conceptual disorganization, 0.37) and with several General Psychopathology items (disorientation and attention, both 0.36; preoccupation, 0.50; and avoidance, 0.40). The LSP-20 Bizarre subscale correlated with three of the PANSS Positive items (delusions, 0.34; conceptual disorganization, 0.63; and hostility, 0.33), none of the Negative items, and several General Psychopathology items (somatic concern, 0.36; uncooperativeness, 0.42; unusual thought, 0.48; attention, 0.39; judgement and insight, 0.36; volition, 0.30; and preoccupation, 0.40). The LSP-20 Self-care subscale correlated with none of the

Table 6. Interrater reliabilities (intraclass correlations) of the LSP-39 and the LSP-20 using data from Trauer *et al.* [3]

	LSP-39	LSP-20
Antisocial	0.61	0.44
Compliance	0.68	0.68
Self-care	0.67	0.75
Bizarre	0.41	0.41
Withdrawal	0.63	0.61
Total	0.67	0.64

PANSS Positive items, two of the Negative items (passive social withdrawal and conversation, both 0.39), and two General Psychopathology items (judgement and insight, 0.31; and preoccupation, 0.34). The LSP-20 Antisocial subscale correlated with one of the Positive items (Hostility, 0.44), none of the Negative items, and one of the General Psychopathology items (impulse control, 0.55). The LSP-20 Compliance subscale correlated with none of the PANSS items, and the LSP-20 total score correlated (0.50) with the PANSS total score.

Another way of looking at the relationship between LSP-20 and PANSS items is by multiple regression. This approach takes into account the intercorrelations between the PANSS items, and shows the independent relationship of these items to the LSP-20 subscales. A forward stepwise regression was conducted with LSP-20 Withdrawal as the dependent variable and all 30 of the PANSS items as independent variables. Three PANSS items (rapport, conversation and depression) jointly accounted for 45.6% of the variance of LSP-20 Withdrawal. Similar analyses found that three PANSS items (conceptual disorganization, delusions and uncooperativeness) jointly accounted for 49.0% of the variance of LSP-20 Bizarre; five PANSS items (passive social withdrawal, preoccupation, hostility, avoidance, and judgement and insight) jointly accounted for 32.0% of the variance of LSP-20 Self-care; five PANSS items (conversation, unusual thought, hallucinations, hostility, and delusions) jointly accounted for 28.1% of the variance of LSP-20 Compliance; and two items (impulse control and hostility) jointly accounted for 33.9% of the variance of LSP-20 Antisocial.

Discussion

We have described a short version of the LSP-39 that retains many of its original features and strengths. With 20 items, the short form is about half the length of the original, but its subscales and total score correlated 0.92 or higher with the original. Test-retest and interrater reliabilities are also comparable with the original, and validity was demonstrated with expected correlations with items of the PANSS. One area in which an important difference was encountered was in the severity of the ratings. Compared with the LSP-39, scores on the LSP-20 tend to reflect lower functioning. This results from the short form comprising relatively more items than the original form that attract ratings indicating lower functioning. This means that levels or thresholds pertaining to one instrument cannot be directly compared with those of the other.

For the sake of consistency and to avoid confusion, the foregoing analyses have been conducted with the 'directionality' of scoring the same across all three forms of the LSP (the LSP-39, the LSP-16 and the LSP-20). In reality, the LSP-39 is scored in the direction of strengths (i.e. high ratings indicate better functioning) and the LSP-16 in the direction of impairments (high ratings indicate poorer functioning). Since the LSP-20 represents an abbreviation of the LSP-39 as well as an extension of the LSP-16, either a 'strengths' or 'impairments'

oriented scoring template could be super-imposed on the LSP-20 format, while retaining the original 'strengths' orientation of the LSP-39 and the 'impairments' orientation of the LSP-16. Since LSP-16 scores, but not LSP-39 scores, can be derived from the LSP-20, the LSP-20 is negatively scored in order to maintain continuity with LSP-16, but users are free to score the LSP-20 from a 'strengths' perspective if they wish to. Both LSP-16 and LSP-20 scores can be derived from the LSP-39. In order to avoid confusion it is important that users be careful to maintain a consistent 'strengths' or 'impairments' orientation when comparing scores on different versions. The anchor point descriptors for the LSP-16 and LSP-20 are unchanged from the LSP-39, so past and future work using the full and short forms of the LSP will stay comparable.

Now that users have a range of LSP versions from which to choose, the question arises of which LSP format to use in which situation. The authors continue to support the use of the full 39-item instrument in circumstances where services have already been using the full instrument regularly or when more reliable estimations of the person's or subgroup's disabilities are required, whether by items, subscales or total scores. Examples of such occasions are individual or service-wide treatment plans and reviews. It is also likely that the LSP-39 may be more suitable for research purposes, while one of the shorter forms may be more suitable for routine service or Statewide disability status or outcome assessments.

On the question of which short form to use, it is important to bear in mind that the LSP-16 is completely contained within the LSP-20; the major difference between them is the presence of a Bizarre subscale in the LSP-20. Therefore, the LSP-16 would be a suitable instrument to use with populations in which psychosis was absent or uncommon, but the LSP-20 when psychosis is more prevalent. Contemporary approaches to outcome measurement advocate the use of multiple measures [12,13]. We referred earlier to recent and current implementations that use the LSP-16 and the HoNOS, and the fact that their joint coverage of psychotic manifestations was minimal. In this case the LSP-20 adds a dimension which the LSP-16 lacks (regarding the lived experience of psychosis) even when the HoNOS is also being used.

Conclusion

The LSP-20 is a brief form of a widely used instrument that offers equivalent coverage to the full form with sound empirical properties. While it may be scored in the direction of strengths, we recommend the impairments direction. In contrast to the LSP-16, the LSP-20 includes the assessment of specifically psychotic phenomena. The

LSP-20 may be more suited to routine assessment of disability and aggregated outcome assessments, but less suited than the LSP-39 to detailed research, or to interactive use as part of service user's individual care planning and review.

By virtue of the selection of items for the LSP-20, total LSP-20 scores tend to reflect slightly lower functioning than the LSP. Thus scores obtained from the LSP-39 and either of the short forms are not directly comparable.

The LSP-20 may be used freely and without charge. A form for its completion may be obtained from the first author. The scoring reflects the impairments orientation of the LSP-16, that is, ratings are assigned the values 0, 1, 2 and 3. If, however, a strengths perspective is preferred, anchor points should take the values 4, 3, 2 and 1.

Acknowledgements

This study was funded by a grant from The Centre for Mental Health, New South Wales Department of Health. We acknowledge the assistance of Beverley Raphael and Sylvia Hands.

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