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PSYCHOMETRIC PROPERTIES OF THE COPING STRATEGY INDICATOR (CSI) IN A STUDY OF COPING BEHAVIOUR AMONGST MALAWIAN STUDENTS

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The Coping Strategy Indicator (CSI; Amirkhan 1990) is an inductively derived measure of responses to adverse circumstances. Although seeking to isolate "a few fundamental strategies with wide applicability" (Amirkhan 1990), the initial validation studies were all based on Californian populations. The present study reports findings from completion of the CSI by 415 Malawian students as part of their enrolment health check up. Factor analysis (principal components analysis with varimax rotation) identified three factors with very similar structure and loadings to those identified by Amirkhan; namely, Support Seeking, Problem Solving and Avoidance. As with the initial validation study, there was some evidence of withdrawal and distraction forming identifiable sub-components of Avoidance. The CSI does appear to provide a measure of core coping strategies which is robust across cultural settings, the theoretical implications of which are considered. The influence of factors such as age and gender on CSI scores is discussed.

KEY WORDS: Coping strategy, support seeking, problem solving, avoidance, culture.

INTRODUCTION

Since the classic work of Folkman and Lazarus (1980) there has been a burgeoning of analysis of coping processes adopted in response to stressful life circumstances. The conceptualisation of coping as a means of deploying resources to mitigate the impact of stressors has won wide currency, and is now adopted in analysis of resilience and vulnerability across a wide range of cultural settings (Brody 1995).

Such analyses commonly acknowledge that adopted strategies of coping are likely to be heavily influenced by cultural values, expectation and structure. Knowledge of modal strategies for coping with difficult circumstances across different cultural groups is potentially of value in planning mental health services both at a local level (where the population is multi-cultural) and in cross-national programmes (such as the provision of support for refugee communities). Before differences in coping strategy can be identified for different cultural groupings, however, measures of cross-cultural validity and reliability need to be established to allow meaningful comparison (Hobfoll *et al.*, 1994, Parker and Endler 1992).

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The development of measures of coping behaviour have reflected two major traditions (Amirkhan 1990). Deductive methodology, based on assessment of coping strategies proposed initially on theoretical grounds, has produced a number of measures, including those reported by Beckman and Adams (1984), Folkman and Lazarus (1980) and Stone and Neale (1984). Whilst achieving a desirable level of generality, such measures have typically attained little empirical support when used as a basis to analyse the coping behaviour of discrete populations (Amirkhan 1990, Parker and Endler 1992). This has encouraged adoption of a more inductive approach, which uses statistical means to identify commonalties in coping behaviour within a sample (Menaghan 1982, Salisbury 1985, Vingerhoets and Flohr 1984). Work within this tradition has produced detailed analysis of specific coping strategies, but is able to contribute little to conceptual understanding of coping processes (Haan 1982).

In response to the promises and constraints of these alternative traditions, Amirkhan (1990) developed the Coping Strategy Indicator (CSI). By refining the item pool indicating coping strategy through assessment of coping behaviour in a series of sample populations, Amirkhan sought to produce an inductively derived instrument which had significant generality across surveyed populations (Amirkhan 1990). The original validation studies of Amirkhan indicated that the CSI offers valid and reliable measures of discrete coping strategies (on the scales Problem Solving, Seeking Support and Avoidance) within a range of Californian populations.

In a critical review of a range of coping assessment instruments Parker and Endler (1992) commend the psychometric robustness of the CSI in comparison to many other measures. They note, however, two issues of concern. The first is the "somewhat narrow range of basic coping behaviours that are assessed" (Parker and Endler 1992, p. 331). This narrowness of focus is confirmed by noting that the proportion of variance explained by the three identified factors within the original validation studies is only of the order of one-third (Amirkhan 1990, p. 1073). Given the inevitable role of discrete environmental characteristics in shaping coping behaviours displayed in a set of situations (Moos and Tsu 1977, Menaghan 1982), some degree of narrowness is a clear consequence of seeking generalisability across varying settings and populations.

Noting this desire for generalisability, however, Parker and Endler's (1992) second major criticism of the CSI is the lack of analyses confirming its factor structure with broader populations. The current study sought to directly address this situation. It involved assessment of the validity of the CSI as a measure of coping strategy in a cultural group quite distinct from those considered in the validation studies of Amirkhan (1990) – Malawian undergraduate students who were the focus of a larger study of coping, attribution and health behaviour.

SUBJECTS

Subjects for the study were the complete intake of first year undergraduate students at Chancellor College, a constituent college of the University of Malawi in the academic year of 1993/94. The students completed a battery of questionnaires as part of their enrolment health check up. The questionnaires were completed on a voluntary basis and under conditions of informed consent. Of the 427 students enrolling at Chancellor College in that year, 415 completed the questionnaire battery. Nine students did not wish to participate in the questionnaire part of the health check up while 3 students failed to

attend for the health check up. Table 1 gives basic demographic statistics regarding the sample.

Fewer than 1% of students enrolling within the Malawi educational system currently progress to the level of university education. Clearly, then, the current sample is in no way representative of the general Malawian population. However, the quota system which operates at the point of university admissions does ensure that university students are drawn in equal proportion from every district of the country. With over 90% of the total population living in rural smallholding communities, students are inevitably drawn from a broad range of ethnic, religious, cultural and economic backgrounds.

METHOD

The Coping Strategy Indicator was distributed to students as part of a health check up, along with other questionnaires relating to health belief and attribution. Whilst the medium of instruction at the University of Malawi is English, and students are generally proficient in its use, a few phrases on the CSI not in common usage were appropriately paraphrased: 'Brainstormed' being paraphrased as 'Thought through'; 'Confided ... to a friend' as 'Talked about ... to a friend'; 'Watched television more than usual' as 'Read newspapers or listened to the radio more than usual' (there is no broadcast television in Malawi); and 'novels or movies' as 'books, stories or films'. Additionally, two items retained the original CSI wording but also incorporated clarifications in brackets: 'Identified with (thought of yourself as being like) ...' and 'Fantasised (thought) ...'.

In direct replication of the work of Amirkhan (1990), students were instructed to identify a stressful event that had occurred within the last six months and consider the manner in which they had coped with it. In accordance with cultural norms which emphasise the privacy of certain personal information, students were requested but not required to briefly write about the stressful event they were imagining. They then completed the 33 item CSI questionnaire.

ANALYSIS

Identified Stressors

Data from the 128 subjects (31% of sample, 29% of men, 38% of women) who described the nature of the stressful event identified for the purpose of completing the CSI were analysed. Events were content analysed in the fashion indicated in Table 1. There was a significant difference in the distribution of events identified by men and women (chi-square = 13.9, df = 4, $p < 0.01$). A greater percentage of women cited bereavements as their stressful event than did men. A higher percentage of men than women cited stressful events related to financial circumstances.

Preliminary Factor Analysis

Data from the 415 subjects was subject to preliminary factor analysis through principal components analysis. The scree plot levelled after three factors, which accounted for

Table 1

a. Sample characteristics	*n*	%
Size	415	100
Sex		
Male	307	74.0
Female	105	25.3
Age		
<21 years	210	50.6
21 to 25 years	165	39.8
Over 25 years	32	7.2
Female Age		
<21 years	88	83.8
21 to 25 years	8	7.6
Over 25 years	8	7.6
Male Age		
<21 years	122	39.7
21 to 25 years	157	51.1
Over 25 years	24	7.8
b. Type of stressful event indentified	*n*	%
Bereavement	37	8.9
(Male	19	6.2)
(Female	18	17.1)
Health	18	4.3
(Male	15	4.9)
(Female	3	2.9)
Academic	30	7.2
(Male	23	7.5)
(Female	7	6.7)
Relationships	13	3.1
(Male	6	2.0)
(Female	7	6.7)
Financial	30	7.2
(Male	25	8.1)
(Female	5	4.8)

Note; Percentages not equalling 100 are due to missing values.

33.4% of total variance. Factors were rotated to orthogonal positions using the varimax method.

Resultant factors and factor loadings are given in Table 2. Factors 1, 2 and 3 correspond with remarkable accuracy to the three factors underlying the scales of Seeking Support, Problem Solving and Avoidance respectively derived within Amirkhan's (1990) analysis. Rotated loadings greater than 0.25 on the appropriate factor were obtained for all 11 items comprising the CSI Problem Solving scale, for all 11 items comprising the Seeking Support scale, and for eight of the 11 items on the CSI Avoidance scale. Two items from the CSI Avoidance scale had no factor loading above the 0.25 threshold, although highest loadings were against factor 3, which is associated with avoidance. A third CSI Avoidance scale item (item 22, 'Buried yourself in a hobby or sports activity to avoid the problem') loaded most strongly on Factor 1, representing strategies of seeking social support.

Table 2 Factor loadings of Coping Strategy Indicator items compared to reported CSI scale loadings (Amirkhan 1990).

Sample item	*CSI Scale*	*Factor 1*	*(CSI Scale Loading)*	*Factor 2*	*(CSI Scale Loading)*	*Factor 3*	*(CSI Scale Loading)*
		Seeking Support		*Problem Solving*		*Avoidance*	
1. Let out feelings to a friend	SS	0.54197	(0.707)				
2. Rearranged things	PS			0.43855	(0.568)		
3. Thought through solutions	PS			0.53433	(0.682)		
4. Tried to distract yourself*	A						(0.473)
5. Accepted sympathy	SS	0.53753	(0.674)				
6. Hid the problem**	A						(0.469)
7. Talked to people, it helps	SS	0.62157	(0.711)				
8. Set goals	PS			0.54062	(0.635)		
9. Weighed options carefully	PS			0.60853	(0.650)		
10. Daydreamed	A					0.46873	(0.637)
11. Tried different solutions	PS			0.59479	(0.580)		
12. Talked to a fried	SS	0.60395	(0.744)				
13. Spent more time alone	A					0.61420	(0.583)
14. Told people	SS	0.57311	(0.715)				
15. Thought about what to do	PS			0.61978	(0.675)		
16. Turned attention to matter	PS			0.56750	(0.673)		
17. Formed plan of action	PS			0.55744	(0.750)		
18. Read more papers etc.	A					0.43933	(0.479)
19. Went to someone	SS	0.59882	(0.702)				
20. Stood firm and fought	PS			0.50498	(0.587)		
21. Avoided people	A					0.59131	(0.643)
22. Hobby or sport	A	0.33898					(0.481)
23. Went to friend	SS	0.70628	(0.799)				
24. Sought friend for advice	SS	0.67589	(0.609)				
25. Accepted sympathy	SS	0.60860	(0.625)				
26. Slept more	A					0.56314	(0.486)
27. Fantasised	A					0.40575	(0.603)
28. Identified with films/books	A					0.44247	(0.500)
29. Tried to solve problem	PS			0.71537	(0.737)		
30. Wished to be alone	A					0.67403	(0.588)
31. Accepted help from friend	SS	0.55617	(0.714)				
32. Sought reassurance	SS	0.61175	(0.732)				
33. Tried to follow plan	PS			0.58249	(0.715)		
Eigenvalues before rotation		5.26564		3.34735		2.4196	
% variance explained		16.0		10.1		7.3	

Total variance explained = 33.4%

Original CSI Scales

SS	Support Seeking
PS	Problem Solving
A	Avoidance

*Item 4 did not have a loading greater than 0.25. The highest was 0.20001 for Factor 3.
**Item 6 did not have a loading greater than 0.25. The highest was 0.17455 for Factor 3.

Internal Consistency

Given the striking coherence of the present factor solution with that of Amirkhan's original validation studies (1990), data was converted to produce a scale score for each subject for each of the three CSI scales. Resultant analysis indicated high internal consistency for the Support Seeking and Problem Solving scales (Cronbach's alpha

coefficients of 0.83 and 0.81 respectively). Internal consistency of scores on the Avoidance scale was appreciably lower (Cronbach's alpha coefficient of 0.63).

Confirmatory Analysis

Given the relatively low internal consistency of scores on the Avoidance scale, and the poorer item-factor match than achieved with both the Seeking Support and Problem Solving scales, confirmatory analysis was pursued to test the goodness-of-fit of the derived solution. Table 3 indicates the results of the testing of four models, replicating the approach of Amirkhan (1990).

These findings are broadly similar to those obtained in that initial validation study. High values of chi-square confirm that all factor solutions were inadequately explaining variation in the data. However, consistent with the findings of Amirkhan (1990), a three factor solution provides a significantly improved fit of the data over a two factor model, with an oblique solution offering no greater explanatory power than an orthogonal one.

Amirkhan's (1990) data across three separate validation samples indicated improved fit through accepting a four-factor solution, though he rejected this on the grounds of parsimony, the fourth factor explaining only an additional 1% of variance. In the present analysis, a four-factor solution explains an additional 4% of variance, and provides a significant – if modest – increment in goodness-of-fit (difference in chi-square = 82.8, $df = 30$, $p < 0.01$).

Exploration of Four-Factor Solution

To consider in further detail the appropriateness of adopting a four-factor solution, item loadings on factors derived from such a solution were calculated. These are shown in Table 4. Other than the development of shared loadings in the range 0.25 to 0.30 on two items, Factors 1 and 2 remain substantially unchanged from the three factor solution. The four-factor solution essentially involves the splitting of the avoidance factor into two, an effect which again represents a replication of a finding of Amirkhan's (1990) original study.

Examination of item loadings suggests that the split is related to the form of avoidant action taken – either withdrawal (e.g., spent more time alone, avoided people, slept more etc.) or distraction (e.g. identified with films or books, fantasised, daydreamed etc.). The original CSI Avoidance scale was therefore split into two sub-scales on the basis of

Table 3

Model Tested	*Chi-sq. value*	*df*	*Chi-sq. difference*	*df*
2 factors, orthogonal	970.7*	463		
			276.4*	31
3 factors, orthogonal	694.3*	432		
			0	0
3 factors, oblique	694.3*	432		
			82.8*	30
4 factors, orthogonal	611.4*	402		

* $p < 0.001$

Table 4 Factor loadings of Coping Strategy Indicator items*

Sample	*CSI Scale*	*Factor 1*	*Factor 2*	*Factor 3*	*Factor 4*
		Seeking Support	*Problem Solving*	*Avoidance Withdrawal*	*Avoidance Distraction*
1. Let out feelings to a friend	SS	0.52795			
2. Rearranged things	PS		0.43680		
3. Thought through solutions	PS		0.53332		
4. Tried to distract yourself**	A				
5. Accepted sympathy	SS	0.50112			
6. Hid the problem***	A				
7. Talked to people, it helps	SS	0.65145			
8. Set goals	PS		0.53827		
9. Weighed options carefully	PS		0.60222		
10. Daydreamed	A				0.59916
11. Tried different solutions	PS		0.60222		
12. Talked to a fried	SS	0.57962			
13. Spent more time alone	A			0.70083	
14. Told people	SS	0.60224			
15. Thought about what to do	PS		0.62127		
16. Turned attention to matter	PS		0.57399		
17. Formed plan of action	PS		0.54844		*0.33367*
18. Read more papers etc.	A			0.33868	*0.20993*
19. Went to somecone	SS	0.60734			
20. Stood firm and fought	PS		0.50471		
21. Avoided people	A			0.73182	
22. Hobby or sport	A	*0.29180*			0.34546
23. Went to friend	SS	0.72684			
24. Sought friend for advice	SS	0.67348	*0.26640*		
25. Accepted sympathy	SS	0.59195			
26. Slept more	A			0.57150	
27. Fantasised	A				0.60233
28. Identified with films/books	A				0.69935
29. Tried to solve problem	PS		0.71733		
30. Wished to be alone	A			0.65327	
31. Accepted help from friend	SS	0.56898			
32. Sought reassurance	SS	0.58802			
33. Tried to follow plan	PS		0.57887		
Eigenvalues before rotation		5.26564	3.34735	2.4196	1.38062
% variance explained		16.0	10.1	7.3	4.2

Total variance explained = 37.6%

Original CSI Scales

SS	Support Seeking
PS	Problem Solving
A	Avoidance

*Italics indicated shared loadings greater than 0.25. Only the major loadings were used.
**Item 4 did not have a loading greather than 0.25. The highest was 0.17229 for Factor 3.
***Item 6 did not have a loading greater than 0.25. The highest was 0.19437 for Factor 3.

loadings on these two avoidance-related factors (using dominant factor weightings to apportion items where there were shared loadings).

Cronbach's alpha coefficients of 0.64 and 0.55 were obtained for the sub-scales Avoidance-Withdrawal and Avoidance-Distraction respectively. Noting the earlier

determination of 0.63 as the internal consistency rating for the full CSI Avoidance scale, this suggests that whilst the four-factor solution provides insight into different emphases within avoidant strategies, sub-scales based on such a solution do not provide an appreciably more reliable account of coping behaviour in the current sample than that based on a three-factor solution.

Relationship to Demographics

The relationship between the variables age and gender and scores on the three scales of the CSI was examined through multiple regression. Age was a significant predictor of Support Seeking for both men and women ($F(1,271)=3.93$, $p<0.05$, $F(1,89)=4.23$, $p<0.05$ respectively), but had no significant influence on other scale scores. Adding gender as a predictor variable indicated that gender influenced scores on the CSI Problem Solving and Avoidance scales ($F(2,358)=3.82$, $p<0.05$ and $F(2,353)=6.00$, $p<0.01$ respectively), but not Support Seeking. Scores on Problem Solving were significantly higher for men ($t=2.71$, $df=359$, $p<0.01$), with women scoring significantly higher than men on Avoidance ($t=2.92$, $df=354$, $p<0.005$).

Computing scores for the sub-scales Avoidance-Withdrawal and Avoidance-Distraction indicated scores on the latter to be significantly higher than the former for both women and men ($t=3.30$, $df=94$, $p<0.001$ and $t=17.1$, $df=269$, $p<0.005$ respectively).

Comparability with CSI Norms

Table 5 shows the mean scores for men and women on each of the CSI scales. Their classification with respect to norms established through the initial CSI validation study are in all cases 'average', defined as within one standard deviation of the norm mean. Men, however, scored on average approaching half a standard deviation higher on Problem Solving and Support Seeking than the validation sample. The mean score for women on Avoidance was approaching one standard deviation higher than the validation sample.

DISCUSSION

The goal of Amirkhan's initial validation study was "to isolate a few fundamental [coping] strategies with wide applicability and to do so by empirically deriving them

Table 5 Mean Scores on Coping Strategy Indicator scales

Scale	*CSI Norm*	*(s.d.)*	*Men*		*Women*	
			Mean	*Difference from norm (in s.d.s)*	*Mean*	*Difference from norm (in s.d.s)*
1. Problem Solving	26.0	(5.0)	28.3	+0.46	26.9	+0.18
2. Support Seeking	23.0	(5.0)	25.0	+0.40	24.2	+0.24
3. Avoidance	19.0	(4.0)	21.3	+0.28	22.7	+0.93

from the data rather than theoretically imposing them upon the data" (1990, p. 1073). The factor structure derived here from analysis of coping behaviour in a Malawian student sample is clearly coherent with the Coping Strategy Indicator scales of Support Seeking, Problem Solving and Avoidance derived from Californian samples. The data here supports, therefore, the "wide applicability" of such scales in understanding coping behaviour to the extent that they represent categories robustly replicated across substantial variation on situation, culture and population.

This 'three-factor' conceptualisation is a development from the two-factor theoretical structure implicit in the problem- versus emotion-focused analysis of Folkman and Lazarus (1980). Within this three-factor structure, Problem Solving is tightly conceived as instrumental activity aimed at resolving a stressful situation, and is not defined in opposition to either emotional or avoidant activity. Of relevance to possible assertions regarding its cross-cultural validity is the suggestion of Amirkhan (1990) that Problem Solving, so defined, may be seen as derivative of fundamental "fight" tendencies, though cross-cultural studies examining psychophysiological correlates of such forms of coping response are clearly required to ascertain the validity of such a construction.

By emerging as an independent factor, Seeking Support asserts the utility of the recruitment of social resources over and above their direct instrumental or diverting value. Amirkhan (1990) sees this as evidence that the factor taps "a primal need for human contact in times of duress, for reasons beyond whatever material aid, advice, or distraction that contact might provide", another assertion relevant to potential cross-cultural generalisation.

The implications of the findings of the current study with respect to the third factor Avoidance – arguably relateable to fundamental "flight" responses (Amirkhan 1990) – are more complex. Internal consistency of the CSI Avoidance scale – at 0.63 – was appreciably lower than the 0.84 reported by Amirkhan with his validation sample (1990). However, there was clear evidence of dual source of variation in Avoidance scores in that study. Whilst Amirkhan chose to retain a clear three-factor solution on the grounds that "the addition of a fourth factor did not appreciably increase explained variance, and, in fact, simply split the Avoidance strategy into two highly correlated subsets" (1990, p. 1068), in the present study those two sources of variation appear to be marginally more distinct. (The potential role in this of the paraphrasing of three of the eleven original CSI Avoidance items to reflect local circumstance should be noted). Sub-scales of Avoidance-Withdrawal and Avoidance-Distraction could be defined on statistical and conceptual grounds, although with alpha coefficients of 0.64 and 0.55 respectively, the reliability of scores derived from such sub-scales is questionable.

On balance, whilst there is insufficient psychometric evidence to define and measure two distinct forms of avoidant coping, this data encourages conceptual exploration of such a distinction. Examining item loadings, the distinction seems to be between avoidance through withdrawal from normative social discourse and routine, and avoidance through engagement in distracting activities or thought-patterns. The social setting of Chancellor College – a fully-residential campus with little off-campus social activity available – may serve to have helped distinguish between these two forms of response in a manner less achievable in populations with greater potential for plurality of response.

The poor internal consistency of the Avoidance scale with the current sample demands caution in the drawing of firm comparative conclusions regarding this sample and the original validation samples (Amirkhan 1990). As noted previously, however, mean

scores for both men and women fell within one standard deviation of the mean of the validation norms. Allied to the remarkable coherence of the factor structure in this and the validation samples, it is clear that there is no evidence here for the coping styles of Malawian students being founded on radically different principles to those of Californian residents. This is not to say that there are no differences in the coping styles shaped by American and African culture – but any such differences operative in the groups discussed here was clearly in the context of significant communality of approaches (Hobfoll *et al.*, 1994). One interpretation of this data is that such communality of approach is ensured by a common biological base for broad categories of coping behaviour (such as the fundamental 'fight' and 'flight' mechanisms noted previously), the precise forms of which are shaped by culture. Such a proposal clearly requires empirical investigation, considering coping responses to environmental circumstances – and their psychophysiological correlates – across a range of cultural settings.

With the current sample, age serving as a predictor of Seeking Support indicates reliance on social networks to be greater in those entering university at a later age. In the Malawian context, such 'delayed' admission is more generally a function of disrupted and extended schooling (often related to economic hardship) rather than active personal choice. The crucial role of social networks in supporting those from harsh economic backgrounds through to higher education is, therefore, one potential source of this effect.

The major effect of gender was the trend for male students to score higher on Problem Solving and female students higher on Avoidance. Traditional sex-role stereotypes within Malawi (seeing men as 'active', women as somewhat more 'passive') remain pervasive in a College environment where male enrolments exceed female enrolments by a ratio of three to one. Such enrolment ratios can be used as a basis to argue, however, for the resilience and successful coping style of those women who do reach the level of higher education within a system that so clearly disadvantages them. Whilst use of the label 'Avoidance' conveys a pejorative tone, such forms of coping behaviour may be highly appropriate in circumstances where stressful events are not functionally under the control of an individual. Interpretation of this gender effect is complicated, however, by indications of differences in the type of stressful event identified by male and female students on completion of the CSI. For instance, 45% of women who gave details of an event (compared to 22% of reporting men) described a bereavement, a circumstance which generally lends itself less to problem-solving approaches (Ager, 1993). It should be noted, also, that for both women and men active distraction was indicated as the more dominant form of avoidance than passive withdrawal. Such observations encourage further the investigation of characteristics of avoidant coping, particularly with regard to emphases on withdrawal or distraction.

As for the CSI itself, further studies establishing its validity across a range of settings are clearly warranted. In addition to similar studies examining the robustness of the factor structure across cultural groups, if it is to become a valuable tool in this field there is a particular need for investigations of the concurrent and predictive validity of the CSI. There were no significant correlations between CSI scores and other measures comprising the health-check battery used in the current study, although the poor internal validity of these latter measures in this context (MacLachlan, Ager and Brown, 1996) constrains interpretation of this finding. To be of value, it is clear that CSI scores need to demonstrably predict coping behaviour or adjustment outcome in 'real world' settings. The current study suggests that such investigations might appropriately be conducted across a range of cultural worlds.

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Alastair Ager is Professor of Applied Psychology in the Department of Management and Social Sciences. Malcolm MacLachlan is now at the Department of Psychology, Trinity College, Dublin.

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