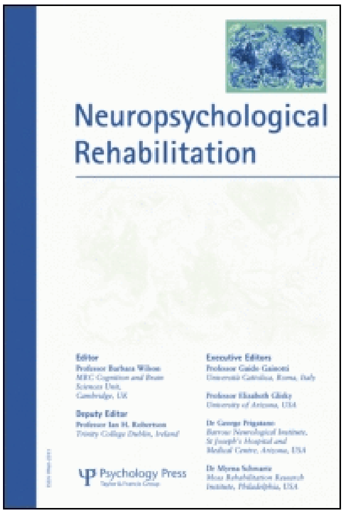

Neuropsychological Rehabilitation
Publication details, including instructions for authors and subscription information:
http://www.informaworld.com/smpp/title~content=t713684225

Prospective memory in healthy Chinese people: The latent structure of the Comprehensive Assessment of Prospective Memory Questionnaire

Raymond C. K. Chan[ab]; Yonghong Qing[c]; Qiuping Wu[d]; David Shum[e]
[a] Neuropsychology and Applied Cognitive Neuroscience Laboratory, Chinese Academy of Sciences, Beijing, China [b] Key Laboratory of Mental Health, Institute of Psychology, Chinese Academy of Sciences, Beijing, China [c] Department of Psychology, Sun Yat-Sen University, Guangzhou, China [d] Department of Educational Psychology, The Chinese University of Hong Kong, Hong Kong, China [e] School of Psychology and Griffith Institute for Health and Medical Research, Griffith University, Brisbane, Australia

First published on: 11 February 2010

To cite this Article Chan, Raymond C. K. , Qing, Yonghong , Wu, Qiuping and Shum, David(2010) 'Prospective memory in healthy Chinese people: The latent structure of the Comprehensive Assessment of Prospective Memory Questionnaire', Neuropsychological Rehabilitation, 20: 3, 459 — 470, First published on: 11 February 2010 (iFirst)

To link to this Article: DOI: 10.1080/09602010903425710

URL: http://dx.doi.org/10.1080/09602010903425710

NEUROPSYCHOLOGICAL REHABILITATION
2010, 20 (3), 459–470

Psychology Press
Taylor & Francis Group

Prospective memory in healthy Chinese people: The latent structure of the Comprehensive Assessment of Prospective Memory Questionnaire

Raymond C. K. Chan[1,2], Yonghong Qing[3], Qiuping Wu[4], and David Shum[5]

[1]Neuropsychology and Applied Cognitive Neuroscience Laboratory, Chinese Academy of Sciences, Beijing, China; [2]Key Laboratory of Mental Health, Institute of Psychology, Chinese Academy of Sciences, Beijing, China; [3]Department of Psychology, Sun Yat-Sen University, Guangzhou, China; [4]Department of Educational Psychology, The Chinese University of Hong Kong, Hong Kong, China; [5]School of Psychology and Griffith Institute for Health and Medical Research, Griffith University, Brisbane, Australia

This study aimed to examine the latent structure of the Chinese version of the Comprehensive Assessment of Prospective Memory (CAPM) using confirmatory factor analysis. A total of 264 healthy Chinese participants (118 men and 146 women) took part in the study and their ages ranged from 17 to 90 years. There was no gender effect upon the frequency of prospective memory (PM) forgetting but age and education were found to be correlated significantly with these frequencies in the current sample. Results of the study also showed that the model with the best fit had a tripartite structure which consisted of a general memory factor (with all items loading on it) plus a basic activities of daily living as well as an instrumental activities of daily living factor. Furthermore, this tripartite model was robust across subgroups with respect to gender, education, and age. These findings provide support for the construct validity of the original CAPM and demonstrate its utility in another culture.

Correspondence should be addressed to Raymond Chan, Institute of Psychology, Chinese Academy of Sciences, 4A Datun Road, Beijing 100101, China. E-mail: rckchan@psych.ac.cn or rckchan2003@yahoo.com.hk

This study was supported partially by the Project-Oriented Hundred Talents Programme (O7CX031003) and the Knowledge Innovation Project of the Chinese Academy of Sciences (KSCX2-YW-R-131) to Raymond Chan.

http://www.psypress.com/neurorehab DOI:10.1080/09602010903425710

Keywords: Prospective memory; Activities of daily living; Normal aging; Chinese.

INTRODUCTION

Prospective memory (PM) deficit is one of the most common subjective complaints reported by older people (Henry, MacLeod, Phillips, & Crawford, 2004). This type of memory is supposedly considered to be dependent on prefrontal lobe functions (Burgess, Quayle, & Frith, 2001; Shum, Valentine, & Cutmore, 1999). PM is defined as the ability to remember to perform an intended action at a specific time in the future (Ellis & Kvavilashvili, 2000). It differs from its counterpart, retrospective memory (RM), which involves the ability to recall or recognise past information (Glisky, 1996). PM consists of two basic components, namely, retrospective and prospective. The former refers to the content of the action, whereas the latter refers to the performance of such an action (Burgess, Veitch, de Lacy Costello, & Shallice, 2000; Graf, Uttl, & Dixon, 2002; Maylor, Smith, Sala, & Logie, 2002).

Most previous studies have focused on using laboratory paradigms to assess PM (Craik, 1986; Einstein & McDaniel, 1990; Maylor, 1996, Maylor et al., 2002). However, the tasks of these paradigms are quite different from real-life situations and have been criticised for lacking ecological validity (Sbordone, 1996). Therefore, a self-report checklist or questionnaire, focusing on real-life behaviours, provides an alternative and important method to evaluate memory complaints of everyday life. Moreover, checklists and questionnaires can also distill observations of everyday difficulties into a usable and reliable form. The study we describe here is concerned with whether such a measure remains useful when applied in a very different culture from the one in which it was developed.

The Comprehensive Assessment of Prospective Memory (CAPM) (Roche, Fleming, & Shum, 2002) is a questionnaire that has three sections. It measures not only the frequency of PM failure, but also evaluates the perceived amount of concern about these memory lapses and the reasons for PM successes or failures. In this study, we focused on the Frequency section, that is, section A. The Frequency section has been applied in individuals with brain injury (e.g., Fleming, Shum, Strong, & Lightbody, 2005; Roche et al., 2002). Items in this section have been grouped into two subscales and found to be applicable in four separate samples of normal adults in different age categories, as well as in a sample where all participants were pooled. These two subscales are called "common" and "uncommon" PM lapses. Uncommon PM lapses are related to basic activities of daily living (BADL), that is, daily self-care tasks (e.g., dressing, eating, personal grooming, and hygiene).

Common PM failures are related to instrumental activities of daily living (IADL), that is, household management activities (e.g., managing finances, shopping, and meal preparation). The reliability of the CAPM is supported by the Cronbach's α for the BADL and IADL subscales (.79 and .92). The validity of the CAPM is supported by theory-consistent group differences (between individuals in three different age groups and between participants with brain injury and matched controls).

Most recently, Chau, Lee, Fleming, Roche, and Shum (2007) further demonstrate an acceptable range of internal consistency among a group of healthy people dwelling in the community. The Cronbach's α for the BADL, IADL and total CAPM scores are .74, .92, and .94, respectively. Also, they found no effects of gender and education on subscale and total scale scores in their healthy sample. However, a significant difference was demonstrated between the young adult group (15–30 years) and older adult groups (31–40 years, 41–50 years, and 51–60 years, with no significant difference shown among these three older age groups).

To date, no standardised checklists or questionnaires have been specifically designed for the assessment of PM in mainland China. Given the promising psychometric properties of the CAPM in both healthy and clinical samples and its potential as a clinically useful PM assessment tool, we have translated the CAPM into Chinese and have provided preliminary norms and findings concerning the psychometric properties among a group of healthy older individuals (Chan, Qing, Yang, and Wu, 2009). The Cronbach's α of the BADL, IADL, and total CAPM scores were .76, .90, and .93, respectively and the test-retest reliability of the BADL, IADL and total CAPM scores were .62, .84, and .84, respectively. The purpose of the current study was to further examine the construct validity of the Chinese version of CAPM. Specifically, it aimed to determine whether age, gender and years of education have any influence on the scores of section A (Frequency scale) of the CAPM among a group of Chinese individuals with a wide age range. Also, it attempted to examine the latent factor structure of the CAPM using confirmatory factor analysis.

METHOD

Participants

A total of 264 (118 men and 146 women) were recruited from five cities in China (Beijing, Wuhan, Guangzhou, Shantou, and Nanjing). The mean age and number of years of education of the participants were 50.57 years ($SD = 22.49$; range = 17–90) and 9.20 years ($SD = 5.20$; range = 0–19), respectively. Participants older than 60 years were screened using the

Chinese version of the Mini-Mental State Examination (MMSE; Wang, Zhang, Qu, Chen, & Zhao, 1989) to ascertain that there was no obvious cognitive decline or associated dementia symptoms. Moreover, individuals who had a past history of neurological or psychiatric illness were excluded from the study to ensure that all participants were cognitively healthy.

Measures and procedure

The CAPM is a 39-item questionnaire capturing specific everyday PM lapses that are related to either BADL or IADL. The participants were required to indicate how often they experienced memory lapses in the last month for each item on a five-point scale. Higher scores indicate more frequent memory failures, ranging from never, rarely, occasionally, often, to very often (daily). Approval for the translation of the questionnaire was obtained from the authors of the original version. Before translation, a panel comprising one neuropsychologist, one health psychologist, and one social psychologist was set up to examine the cultural appropriateness of the items in the original version. As a result, four items were eliminated and three items were adapted to suit the Chinese setting. The four items being eliminated included: item 7 (walking into room and forgetting why you went there), item 34 (leaving the stove on), item 24 (not remembering a bank cheque), and item 29 (forgetting to put petrol in your car). Items 7 and 34 were eliminated mainly due to their poor factor loadings in the original study (Roche et al., 2002), whereas items 24 and 29 were replaced because they are not as relevant in Chinese society. Items that were adapted for the local setting included item 2 (replacing doctor or therapist with family members or friends), item 35 (replacing the letter with paying bills for water or electricity fees), and item 36 (replacing checking the diary with checking daily items like bathroom or kitchen items, etc.). The Chinese translation was then undertaken by the first author of this study. To cross check, the translated version was independently back-translated by another Chinese speaker (the second author) with any identified differences in key content areas used to revise the questionnaire.

The study was approved by the ethics committee of the Institute of Psychology, Chinese Academy of Sciences. Written consent was obtained from all participants before the administration of the questionnaire. For those participants who were illiterate, the questionnaire was read aloud by a research assistant and their verbal replies recorded.

Confirmatory factor analyses

Confirmatory factor analysis (CFA) based on maximum likelihood estimation was performed on the raw scores of the CAPM items using Lisrel 8.0 for Windows. The Satorra-Bentler scaled chi-squared statistic ($S - B\ \chi^2$) was widely used as a goodness of fit index to assess the fit of the CFA models. If $(N - 1)F_{ML}$ is significant, one rejects the null hypothesis that the model fits the data perfectly. Although this is a commonly used procedure, it has its limitations. The primary problem is that the fit index is so sensitive to the size of the sample that even if F_{ML} is small (meaning that the discrepancy or lack of fit is small), a sufficiently large N can lead to a significant χ^2, resulting in the rejection of the model. Nevertheless, it is still an important index because it allows one to directly test the differences in the fit of nested models (Model B is said to be nested within model A if Model B is obtained from Model A by imposing additional restrictions). The chi-square difference tests can be directly used to compare nested models. If the statistic is significantly larger than the critical value on some test level (in the present case, $\alpha = 0.05$), it implies that imposing an additional new restriction makes the fit of the model worse and we should reject the nested model.

Root Mean Square Error of Approximation (RMSEA; Browne & Cudeck, 1992), takes into account the degree of freedom and is strongly recommended in the literature as a measure of fit to minimise rejection of good fitting models, thus it was possible to preserve those virtually parsimonious models with a large sample. An RMSEA $<$ .05 indicates a close fit, .05–.08 a reasonable fit, .08–.10 a mediocre fit, and RMSEA $>$ .10 is unacceptable. A Comparative Fit Index (CFI) was also provided in this study as an appropriate index to assess the fit of the model. This index represents the extent to which covariance between manifest variables has not been accounted for by the models under consideration. A CFI $>$ .95 indicates good fit.

We have included several alternative models for comparisons. The first model (Model 1) was the most parsimonious model with a single factor. This model assumed that the manifest variance in the CAPM could be explained by one latent common factor which was named general memory. Model 2 was a two-independent (i.e., orthogonal) factors models which constrained all BADL (Items: 6, 12–17, 19, 22, 24) and IADL (Items: 1–5, 7–11, 18, 20–23, 25–33) items to load only on their respective factors. Another similar two-factor model was constructed to test the latent structure of the CAPM, and was named Model 3. The only difference between Model 2 and Model 3 was that the two factors in the latter were allowed to correlate so that Model 3 was nested within Model 2.

Model 4a was a basic bifactor structure model which can be seen as the combination of Models 1 and 2. This model assumed that all 33 items were indicators of a common factor representing general memory as Model 1 and synchronously constrained the BADL and IADL to be the indicators of their specific memory factor as Model 2. The three components were constrained to be orthogonal to each other in Model 4a. Models 4b and 4c were obtained from Model 4a by imposing additional restrictions on the basic bifactor model. Model 4b omitted the IADL factor entirely, and aimed at testing whether all CAPM items tap general memory but only the BADL items tap an additional specific factor. Conversely, Model 4c omitted the other, IADL, factor. We also attempted to examine the robustness of the final model by replicating it across sub-samples with respect to educational level, age and gender.

RESULTS

Effects of gender, age and education on PM

The summary statistics of the CAPM are included in Table 1. Cronbach's alphas for the CAPM total, IADL, and BADL scales were .925, .93, and .915, respectively. Independent samples *t*-tests were conducted to evaluate the effect of gender on CAPM scores. Results showed that men and women did not differ significantly on the frequency scores for total scale ($t = 1.854$, $p = .065$), BADL subscale ($t = 1.961$, $p = .051$), and IADL subscale ($t = 1.712$, $p = .088$). The small effect sizes associated with these tests, d (total) = .23; d (BADL) = .24; d (IADL) = .21, reinforced the idea that gender did not have an effect on the CAPM. Pearson's correlation coefficients were calculated to examine the relationship between age and CAPM scores: total scale ($r = -.319$, $p = .0001$), IADL scale ($r = -.378$, $p = .0001$) and BADL scale ($r = -.280$, $p = .0001$). All of these correlations achieved statistical significance. Years of education was also found to be positively correlated with the total scale ($r = .152$, p = .013), BADL subscale ($r = .188$, $p = .002$), and IADL subscale ($r = .131$, $p = .033$).

Testing competing confirmatory factor analytic models of the CAPM

The fit statistics, including χ^2, RMSEA and CFI, for all of the CFA models are presented in Table 2 and the results of testing for differences between nested CFA models are summarised in Table 3. From Table 3, it can be seen that the two factors model (Model 3) had significantly better fit ($p < .001$) than the general single factor model (Model 1). In the comparison between

TABLE 1
Summary statistics for the CAPM

Scale	*Mean*	*Median*	*SD*	*Range*
Total CAPM score	59.67	58	16.51	33–132
Basic Activities of Daily Living (BADL)	14.50	14	4.51	9–36
Instrumental Activities of Daily Living (IADL)	45.17	44	12.71	24–96

TABLE 2
Fit indices for confirmatory factor analytic models of the CAPM (best fitting model in bold)

Model	χ^2	*df*	*RMSEA*	*CFI*	*PR*
1. Single memory factor	1766.57	495	.098	0.733	0.88
2. BADL and IADL Memory as orthogonal factors	1871.76	495	.103	0.662	0.88
3. BADL and IADL Memory as correlated factors	1761.75	494	.099	0.739	0.88
4a. Tripartite model (general memory plus orthogonal specific BADL and IADL factors)	931.927	462	.062	0.848	0.82
4b. Tripartite model with specific IADL factor removed	1656.90	485	.096	0.750	0.86
4c. Tripartite model with specific BADL factor removed	1033.79	472	.067	0.829	0.84

Note: *df* = degree of freedom; RMSEA = Root Mean Square Error of Approximation; CFI = Comparative Fit Index; PR = Parsimony Ratio = *df*/[0.5 k(k+1)], in which k denotes the number of observed variables.

TABLE 3
Result of testing for fifferences between nested CFA models of the CAPM

Comparison				
More constrained	*Less constrained*	*Difference in* χ^2	*df*	*p*
Model 2	Model 3	110.01	1	<.001
Model 1	Model 3	4.82	1	.028
Model 4b	Model 4a	724.973	23	<.001
Model 4c	Model 4a	101.863	10	<.001

the two-independent factors with two-correlated factors models, we can see that BADL and IADL factors should be correlated ($r = .91$). The basic tripartite model (Model 4a) had the best fit of all models based on all fit indexes ($\chi^2 = 931.927$, $df = 462$; RMSEA = .062; CFI = .848). A graphical representation of the tripartite model of the CAPM (Model 4a) is presented in Figure 1. The latent factors are represented as large circles and the 33 manifest variables as rectangles. The error variances are omitted here to simplify the appearance of the diagram. The causal arrows represent the influence of the latent variables on the manifest variables. Model 4b and 4c were obtained from Model 4a by omitting either the IADL factor or the BADL factor. The chi-square difference tests demonstrated that none of specific factors should be omitted ($p < .001$).

Retesting models for gender, education and age subgroups

We repeated constructing the same models across sub-samples with different education, age and gender subgroups. Firstly, we undertook testing models for males and females separately, considering that gender is a very important

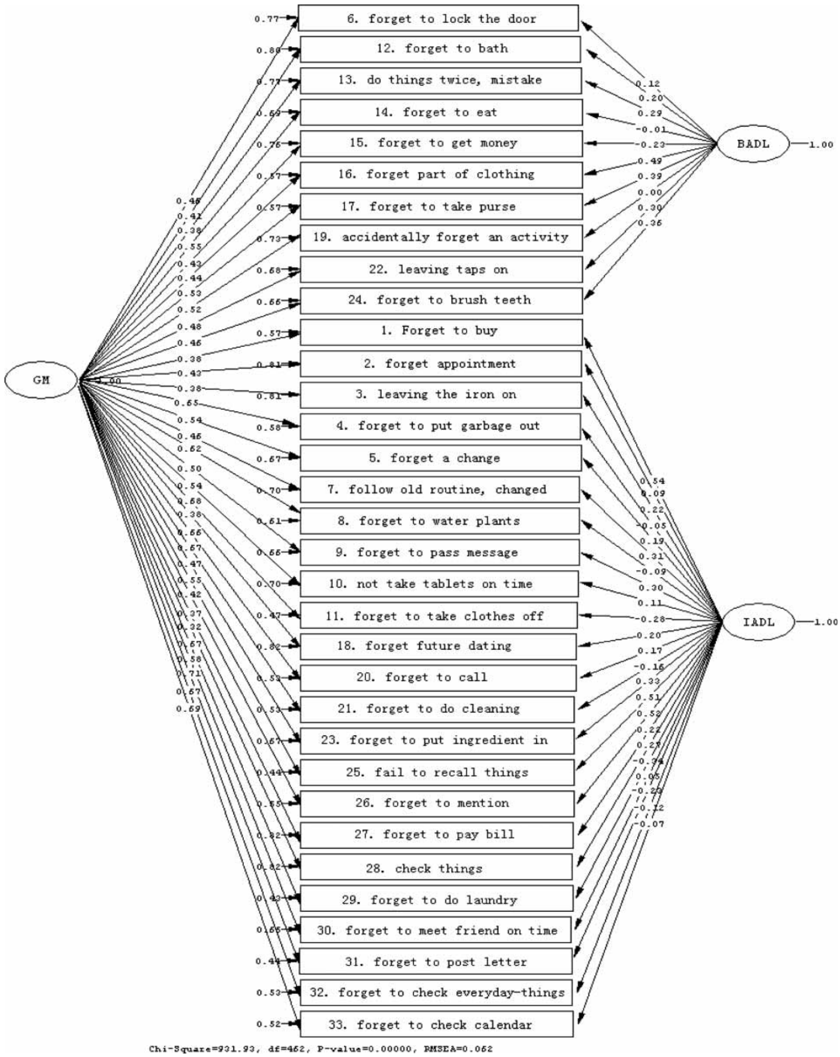

Figure 1 Graphical representation of the tripartite model for the Chinese version of CAPM.

demographic variable. The result showed that the basic tripartite model (Model 4a) had the best fit (χ^2 = 771.435, df = 462; RMSEA = .0757; CFI =.945, see Table 4). Secondly, we re-coded education level into a dichotomised variable. Participants whose educational level was more than 9.2 years were allocated into the high education group, and the rest were allocated into the low education group. We then tested the models' robustness in these two groups. For the low education group, we can see from Table 5

TABLE 4
Retesting the models across gender

	Male (N =118)				*Female (N = 146)*			
Model	χ^2	*df*	*RMSEA*	*CFI*	χ^2	*df*	*RMSEA*	*CFI*
1	1007.162	495	.0940	0.923	1488.300	495	.118	0.877
2	1035.823	495	.0966	0.897	1376.611	495	.111	0.855
3	1005.975	494	.0941	0.923	1451.401	494	.116	0.878
4a	771.435	462	.0757	0.945	774.457	462	.0683	0.927
4b	941.279	485	.0897	0.927	1301.020	485	.108	0.884
4c	835.342	472	.0811	0.938	830.827	472	.0724	0.926

Note: Models 1–4c are the same with those listed in Table 2.

TABLE 5
Retesting the models across subsamples with different educational level

	Low education (N = 126)				*High education (N = 138)*			
Model	χ^2	*df*	*RMSEA*	*CFI*	χ^2	*df*	*RMSEA*	*CFI*
1	1545.50	495	.130	0.857	999.634	495	.0863	0.939
2	1489.18	495	.127	0.832	996.334	495	.0860	0.915
3	1538.21	494	.130	0.857	996.587	494	.0862	0.938
4a	799.86	462	.076	0.913	752.732	462	.0678	0.956
4b	1469.443	485	.127	0.863	924.046	485	.0813	0.943
4c	798.142	472	.074	0.915	796.257	472	.0708	0.952

Note: Models 1–4c are the same with those listed in Table 2.

that both model 4a and 4c are preferable, suggesting that the BADL factor is an important latent construct but that the IADL factor is more important. Similarly, both model 4a and 4c are best for the high education group, but

TABLE 6
Retesting the models across young and old subsamples

	Young (N = 106)				*Old (N = 156)*			
Model	χ^2	*df*	*RMSEA*	*CFI*	χ^2	*df*	*RMSEA*	*CFI*
1	965.423	495	.0951	0.865	1405.246	495	.108	0.912
2	957.879	495	.0944	0.837	1405.547	495	.108	0.886
3	961.073	494	.0949	0.865	1401.012	494	.108	0.912
4a	718.857	462	.0728	0.904	825.699	462	.0708	0.945
4b	883.052	485	.0884	0.875	1352.602	485	.107	0.916
4c	793.656	472	.0806	0.892	841.759	472	.0706	0.944

Note: Models 1–4c are the same with those listed in Table 2.

the tripartite model was a little better than model 4c, which did not include BADL. Lastly, the role of age was tested. According to the average age, all participants were divided into an older or a younger group. As predicted, the results still support the tripartite model (see Table 6). Results of all analyses suggested that the tripartite model is robust across gender, education and age subgroups.

DISCUSSION

The present findings suggest that the best fit model for the translated version of the CAPM was the tripartite latent model, namely, the general memory factor together with the BADL and IADL components. Furthermore, this tripartite model is satisfactorily robust across sub-samples with different educational levels, age, and gender. These findings were in accordance with the theoretical basis of the CAPM development. Roche et al. (2002) attempted to develop a questionnaire to capture two forms of activities of daily living (ADL), namely the basic ADL and the instrumental ADL. The former involves ability to take care of oneself in basic daily care such as dressing and door locking, whereas the latter involves manipulation of instruments in order to achieve certain types of activities such as ironing and bill paying. These types of items are useful for management of memory problems and in evaluating the efficacy of neuropsychological rehabilitation for patients with neurological or cognitive deficits (e.g., Fleming et al., 2005; Roche et al., 2002; Shum et al., 1999). For example, by asking patients to fill in the CAPM, one can quickly get an overall picture about whether PM forgetting is common for the patient. In addition, by having a closer look at the items, a clinician can focus on the problems that are considered to be most problematic for the patient and can plan treatment accordingly. Furthermore, clinicians can use the CAPM to document whether or not there are any changes in PM problems after a memory treatment programme.

The present study has some limitations. The findings were only based on self-report data. It would be worthwhile to examine proxy-reported data. It is especially important for clinical populations because a lot of patients with neurological or cognitive deficits, such as dementia or traumatic brain injury, may not be able to report their own problems accurately (e.g., Bennett, Ong, & Ponsford, 2005; Chan & Bode, 2008; Crawford, Henry, Ward, & Blake, 2006).

In conclusion, CAPM was negatively related with age and positively related with education. The tripartite latent model was found to be the most optimal model for CAPM. Notwithstanding the methodological limitations, this study may allow further cross-cultural comparison of PM performances.

REFERENCES

Bennett, P. C., Ong, B., & Ponsford, J. (2005). Assessment of executive dysfunction following traumatic brain injury: Comparison of the BADS with other clinical neuropsychological measures. *Journal of the International Neuropsychological Society*, *1,* 606–613.

Browne, M. W., & Cudeck, R. (1992). Alternative ways of assessing model fit. *Sociological Methods and Research*, *21,* 230–258.

Burgess, P. W., Quayle, Q., & Frith, C. D. (2001). Brain regions involved in prospective memory as determined by positron emission tomography. *Neuropsychologia*, *38,* 545–55.

Burgess, P. W., Veitch, E., de Lacy Costello, A., & Shallice, T. (2000). The cognitive and neuroanatomical correlates of multitasking. *Neuropsychologia*, *38,* 848–863.

Chan, R. C. K., & Bode, R. (2008). Analysis of patient and proxy ratings on the executive function: An application of Rasch analysis. *Journal of Neurology, Neurosurgery and Psychiatry*, *79,* 86–88.

Chan, R. C. K., Qing, Y., Yang, T., & Wu, Q. (2009). Prospective and retrospective memory in healthy and demented Chinese elder people. Manuscript submitted for publication.

Chau, L. T., Lee, J. B., Fleming, J., Roche, N., & Shum, D. (2007). Reliability and normative data for the Comprehensive Assessment of Prospective Memory (CAPM). *Neuropsychological Rehabilitation*, *17,* 707–722.

Craik, F. I. M. (1986). A functional account of age differences in memory. In F. Klix & H. Hagendorf (Eds.), *Human memory and Cognitive Capabilities: Mechanisms and performances: Symposium in memoriam Hermann Ebbinghaus 1885*, Berlin Humboldt University, Amsterdam: North-Holland, 409–422.

Crawford, J. R., Henry, J. D., Ward, A. L., & Blake, J. (2006). The Prospective and Retrospective Memory Questionnaire (PRMQ): Latent structure, normative data and discrepancy analysis for proxy-ratings. *British Journal of Clinical Psychology*, *45,* 83–104.

Ellis, J. A., & Kvavilashvili, L. (2000). Prospective memory in 2000: Past, present, and future directions. *Applied Cognitive Psychology*, *14,* S1–S9.

Einstein, G. O., & McDaniel, M. A. (1990). Normal aging and prospective memory. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, *16,* 717–726.

Fleming, J. M., Shum, D., Strong, J., & Lightbody, S. (2005). Prospective memory rehabilitation for adults with traumatic brain injury: A compensatory training programme. *Brain Injury*, *19,* 1–10.

Glisky, E. (1996). Prospective memory and the frontal lobes. In M. Brandimonte, G. O. Einstein, & M. A. McDaniel (Eds.), *Prospective Memory Theory and Applications* (pp. 249–266). Marwah, NJ: Lawrence Erlbaum Associates.

Graf, P., Uttl, B., & Dixon, R. (2002). Prospective and retrospective memory in adulthood. In P. Graf & N. Ohta (Eds.), *Lifespan Development of Human Memory* (pp. 235–256). Cambridge, MA: MIT Press.

Henry, J. D., MacLeod, M. S., Phillips, L. H., & Crawford, J. R. (2004). A meta-analytic review of prospective memory and aging. *Psychology and Aging*, *19,* 27–39.

Maylor, E. A. (1996). Does prospective memory decline with age? In M. Brandimonte, G. O. Einstein, & M. A. McDaniel (Eds.), *Prospective Memory: Theory and Applications* (pp. 173–197). Mahwah, NJ: Lawrence Erlbaum Associates.

Maylor, E. A., Smith, G., Sala, S. D., & Logie, R. H. (2002). Prospective and retrospective memory in normal aging and dementia: An experimental study. *Memory & Cognition*, *30,* 871–884.

Roche, N., Fleming, J. M., & Shum, D. (2002). Self-awareness of prospective memory failure in adults with traumatic brain injury. *Brain Injury*, *16,* 931–945.

Sbordone, R. J. (1996). Ecological validity: Some critical issues for neuropsychologist. In R. J. Sbordone & C. J. Long (Eds.), *Ecological Validity of Neuropsychological Testing* (pp. 15–41). Delray Beach, FL: GR Press/St. Lucie Press.

Shum, D., Valentine, M., & Cutmore, T. (1999). Performance of individuals with severe long-term traumatic brain injury on time-, event-, and activity-based prospective memory tasks. *Journal of Clinical and Experimental Neuropsychology*, *21,* 49–58.

Wang, Z. Y., Zhang, M. Y., Qu, G. Y., Chen, J. X., & Zhao, J. (1989). The application of the Chinese version of Mini Mental State Examination. *Shanghai Psychiatry Medicine*, *7*(3), 108–111 (in Chinese).

Manuscript received May 2008
Revised manuscript received October 2009
First published online February 2010