

## **A COMPARATIVE STUDY OF KNOWLEDGE SHARING BEHAVIOUR OF PHYSICAL EDUCATION AND SPORT PROFESSIONALS**

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### **ABSTRACT**

*This study compared different theories on the knowledge sharing behaviour of sport professionals and considers the differences according to occupation. A questionnaire was distributed to professionals in physical education and sport in Taiwan. The subjects were targeted using a stratified random sampling method. Structural equation modelling was used to perform data analysis on 666 valid questionnaires. The Theory of Planned Behaviour (TPB) explained the behavioural models regarding their interpretation of knowledge sharing behaviour and intentions. The findings indicated that such behaviour indirectly, but positively, impacted by subjective norms, shared attitudes, perceived behavioural control and shared intentions. Knowledge sharing behaviour differed significantly among sport professionals employed in academia and industry, with the intention to share exerting the greatest influence. Attitude was the most influential, followed by subjective norms and perceived behavioural control. In the industrial model, perceived behavioural control was most consequential, followed by attitudes and subjective norms. The results confirm that the theory of planned behaviour not only has good explanatory power, but also effectively predicts such behaviour among physical education and sport professionals in general.*

**Key words:** Theory of Planned Behaviour, Professionals of Physical Education and Sport, Knowledge Sharing Behaviour, Model Comparison.

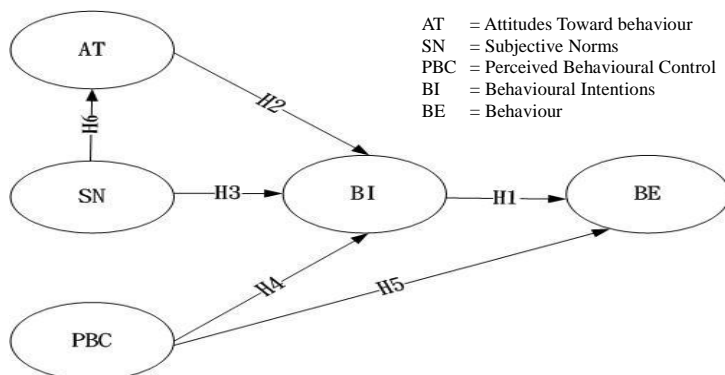
### **INTRODUCTION**

The 21<sup>st</sup> century is the age of the knowledge economy. Its development has been driven by innovation, technology, information, globalisation and competitiveness. Knowledge is an asset that grows with use; it is also the only unlimited resource in the world (Small & Sage, 2006; Lai, 2010). Since knowledge is constantly changing, the critical part of a knowledge economy is not the knowledge itself, but rather 'knowledge management' driven by the attainment, storage, dissemination and application of knowledge in innovative ways, which benefit individuals or organisations (Small & Sage, 2006). The priority for managers of a knowledge economy is sharing knowledge (Thurrow, 2003; Sheikh, 2008). Only through sharing can organisations capitalise on the value of knowledge. Knowledge management has

thus become an important means of measuring organisational learning (Brauner & Becker, 2006).

Knowledge sharing is important, as knowledge differs from common tangible assets that offer diminishing returns on investment (Helms *et al.*, 2010). Physical Educators and sport professionals are not only knowledge workers and managers, but also knowledge and information transformers, as well as communicators, transformers and sharers of theories, experiences and technologies (Edvinsson & Malone, 1997). Sport academics and the sport industry have recently discovered the importance of sharing knowledge. In a knowledge economy, sharing can enable the accumulation and renewal of the stocks of knowledge that broaden sport academia and the sport industry (Su, 2009; Chen, 2010; Tsai, 2010). Therefore, the implementation of knowledge sharing among sport professionals should facilitate the utilisation and transformation of individual expertise into organisational knowledge, which can in turn be used to enhance organisational performance. The study of knowledge sharing has hitherto mainly focused on corporations, rather than sport professionals, especially in systems theory-based approaches. In contrast, this study used different theoretical models to compare the knowledge sharing behaviours of sport professionals. The study's objectives were: (1) to compare the knowledge sharing behaviours of different sport professionals to models of intention; and (2) to compare the knowledge sharing behaviour models of sport professionals from different occupational fields.

In terms of behavioural theories, earlier studies have favoured the Theory of Reasoned Action (TRA), the Theory of Planned Behaviour (TPB) and the Modified Theory of Planned Behaviour (MTPB). The TRA was introduced in 1967, with the main assumption being that humans are rational individuals. Behavioural Intentions (BI) is determined by the Attitudes Toward behaviour (AT) and Subjective Norms (SN). The AT include positive and negative evaluations. SN is influenced by society (Fishbein & Ajzen, 1975; Goldberg *et al.*, 1997). Therefore, the TRA assumes that attitudes and subjective norms are independent and that behaviours (BE) may be indirectly influenced by BI (Fishbein & Ajzen, 1975; Ajzen & Fishbein, 1980). The structure of the TRA is shown in H1, H2 and H3 in Figure 1. It includes the dependent variables of individual behaviours and behavioural intentions, as well as the independent variables of individual behaviour, namely attitudinal tendencies and subjective norms (Ajzen, 2001a; Ryu *et al.*, 2003).



**FIGURE 1: HYPOTHESISED STRUCTURE MODEL**

Ajzen (1991), devised the theory of planned behaviour and claimed that behavioural intentions were not only influenced by attitudes and subjective norms in the Theory of Reasoned Action model, but also by perceived behavioural control. The Theory of Planned Behaviour (TPB) stresses how behaviours are determined by 'Behavioural Intentions' (BI), which are influenced by 'Attitudes Toward Behaviour' (AT), 'Subjective Norms' (SN) and 'Perceived Behavioural Control' (PBC). The process by which it is formed and analyses behaviour, and the structure of the TPB is shown in H1, H2, H3, H4, and H5, in Figure 1.

The results of Ajzen's earlier research (1985), can be compared to other works (Shimp & Kavas, 1984; Vallerand *et al.*, 1992), that indicate how SN of personal behaviour directly influences AT. These empirical research results modified the TBP model into the MTBP model. The structure of the MTBP is shown in H1, H2, H3, H4, H5, and H6, in Figure 1.

All three models maintain that behaviour determines personal BI, whereas the TPB and MTBP models add 'Perceived Behavioural Control' (PBC) as an influence. Regarding the factors that influence BI, there are some slight differences among the three models. The Theory of Reasoned Action (TRA) stresses how ATB and SN determine BI. The Theory of Planned Behaviour (TPB) maintains that AT, SN and PBC are the most consequential variables (Chau & Hu, 2001). The MTPB model adds the subjective norm's influence to the attitudes toward behaviour, which enhances its predictive ability in relation to individual behaviour.

The three theories applicable to this study include: the Theory of Reasoned Action (TRA) (Hypothetical model: H1, H2 and H3), the Theory of Planned Behaviour (TPB) (Hypothetical model: H1, H2, H3, H4 and H5) and the Modified Theory of Planned Behaviour (MTPB) (Hypothetical model H1, H2, H3, H4, H5 and H6).

The following hypotheses were explored:

1. Compare the knowledge sharing behaviour of sport professionals with different behavioural intention models.

*Hypothesis 1:* Sharing intentions directly affect sharing behaviour.

*Hypothesis 2:* Knowledge sharing attitudes positively and directly affects the knowledge sharing intention.

*Hypothesis 3:* Knowledge sharing subjective norms positively and directly affects the knowledge sharing intention.

*Hypothesis 4:* Perceived knowledge sharing behaviour positively controls and directly affects knowledge sharing intentions.

*Hypothesis 5:* Perceived control of knowledge sharing behaviour positively and directly affects knowledge sharing behaviour.

*Hypothesis 6:* Knowledge sharing subjective norms positively and directly affects the knowledge sharing attitudes.

2. A comparison of the knowledge sharing behaviour models of sport professionals in different working fields.

*Hypothesis 7:* Industry and the education sector have significantly different models of knowledge sharing behaviour.

## METHODOLOGY

### Subjects

The subjects of the study were professionals employed by Taiwan's sport, exercise, sport health, recreational sport and dance industries. The purposive sampling method was chosen and 1 200 questionnaires were issued. Six hundred and sixty-six (666) valid questionnaires were retrieved, which provided an acceptable retrieval rate of 55.50%. More males than females featured in the sample (61.6% and 38.4% respectively) and most participants were in the 21 to 30 year range, followed by the 31 to 40 range (61.6% and 38.4% respectively). The majority were graduates of vocational schools, followed by colleges (47.3% and 35.9% respectively) and employed in the industry sector, followed by academia (36.64% and 63.36% respectively). The percentage from the academic sector was comprised of people working in schools (14.11%), colleges (8.75%), and universities (40.54%). These physical education specialists were primarily involved in sport coaching, administration and sport science research.

### Research tool

The development of the research tool was based on an examination of related literature and a published questionnaire (Ajzen, 2001b; Bock & Kim, 2002; Wu, 2003; Liu, 2006). The characteristics of the sport profession were also taken into consideration, and a 7-point Likert rating scale was applied to develop the *Sports Professional Knowledge Sharing Behaviour Survey Questionnaire*. This 6-part questionnaire was comprised of sharing attitudes, subjective norms, Perceived Behavioural Control (PBC), knowledge sharing behaviour and knowledge sharing intentions. After the questionnaire's initial draft was completed, 6 academics and experts from sport-related fields were invited to help ratify the validity of the questionnaire (expert validity). Sport professionals were then asked to test the questionnaire to clarify the subject's responses to the questions and to edit the questionnaire accordingly. One hundred and thirty nine (139) questionnaires were then randomly drawn as test samples for item analysis and reliability analysis, and 527 questionnaires were selected for confirmatory factor analysis, to verify if each observed variable could effectively reflect its latent variable.

The item analysis was conducted on 139 test questionnaires. The item analysis results showed that every question reached significant variation ( $p=0.00$ ), indicating each question had discriminate validity. Moreover, the Cronbach's alpha value of each subscale was as follows: 0.87 for the 'knowledge sharing attitudes' aspect, 0.84 for the 'subjective norm' aspect, 0.87 for the 'perceived behavioural control' aspect, 0.90 for the 'knowledge sharing behaviour intention' aspect, 0.88 for the 'knowledge sharing behaviour' aspect, and 0.92 for Cronbach's total scale alpha value.

In summary, it showed that the content validity and questions in each aspect of the questionnaire were consistent, with all questions falling into the acceptable range. The confirmatory factor analysis was then conducted using AMOS 17. The results indicated that the model matched the goodness-of-fit evaluation indicators with: GFI (Goodness-of-Fit Index)=0.95; NNFI (Non-Normed Fit Index)=0.96; CFI (Comparative Fit Index)=0.98; CN (Critical N)=267; RMSEA (Root Mean Square Error of Approximation)=0.054. The observed

variable reliability ( $R^2$ ) was between 0.50 and 0.83 and the latent variable construct reliability was between 0.84 and 0.90.

The observed variable validity value ( $\lambda$ ) was between 0.71 and 0.91 and the latent variable average variance extraction (validity) was between 0.64 and 0.75 (Table 1). Each matched the reliability and validity indicator standard (Huang, 2004). Therefore, the reliability and validity of the scale was acceptable. Following that, a structural model and multiple group comparison were tested using the structural equation modelling method (Chen, 2007; Chiou, 2010).

**TABLE 1: SUMMARY OF CONFIRMATORY FACTORY ANALYSES**

<b>Item</b>	<b><math>\lambda</math></b>	<b><math>R^2</math></b>	<b>Cronbach's alpha</b>	<b>Average variance</b>
<i>Knowledge sharing attitudes</i>			0.87	0.69
C1 Knowledge sharing is a good thing	0.87	0.75		
C2 Knowledge sharing is valuable	0.91	0.82		
C3 Sharing helps to maintain harmonious relationships with others	0.71	0.50		
<i>Subjective norm</i>			0.84	0.64
D3 Service institutions encourage knowledge sharing	0.72	0.51		
D4 The management believes I should provide knowledge	0.84	0.71		
D5 Colleague believes I should provide knowledge	0.83	0.69		
<i>Perceived behavioural control</i>			0.87	0.70
K2 Able to control whether to provide knowledge	0.83	0.69		
K3 Know which method to use to provide knowledge	0.89	0.79		
K5 Sufficient communication ability to share knowledge	0.78	0.61		
<i>Sharing intention</i>			0.90	0.75
B1 Willing to share knowledge	0.83	0.70		
B3 Intend to share knowledge	0.91	0.83		
B4 Try hard to share knowledge	0.85	0.73		
<i>Sharing behaviour</i>			0.88	0.71
A1 Share knowledge and experience often	0.84	0.71		
A2 Resolve professional issues for colleagues	0.87	0.76		
A3 Assist colleagues to find a resolution strategy	0.80	0.65		

## Analysis of data

There are two ways to compare competing models: nested structure and non-nested structure. Nested structure imposes constraints on the non-constrained model by examining the discriminate validity and the difference of chi-square between the non-constrained model and the constrained model. There are two types of non-nested structure models. One type is having the same covariance matrix but different parameters. That is, the two models have the same items and dimensions but in different orders. The other model has a nested structure having neither the same covariance matrix nor the same parameters, with different models even having different survey items (Ha *et al.*, 2010; Chang, 2011; Kline, 2011). This study compared the models developed on the basis of three different theories and the models among different professional groups. The former examines the fitness of models and the amount of explained variance ( $R^2$ ), which are called model selection tests (Diamantopoulos & Siguaw, 2000; Chang, 2011). The latter compares path coefficients in both groups, using a multiple-groups or multi-sample analysis (Chen, 2007).

## RESULTS

### Comparison of sport professional knowledge sharing behaviour in different behaviour intention models

The Theory of Reasoned Action (TRA), the Theory of Planned Behaviour (TPB) and the Modified Theory of Planned Behaviour (MTPB) models were utilised to explore the knowledge sharing behaviour of sport professionals. From the overall fit indexes of the investigated models in Table 2, it was possible to determine that the indexes of the 3 models all met the evaluation standard.

**TABLE 2: OVERALL FIT INDEXES OF INVESTIGATED MODELS**

Fit index	Obtained value	TRA	TPB	MTPB
$\chi^2$	–	146.29	201.42	233.69
df	–	50.00	82.00	83.00
GFI	0.9	0.96	0.95	0.95
AGFI	0.9	0.93	0.93	0.92
RMSEA	0.1	0.06	0.05	0.06
NNFI	0.9	0.96	0.96	0.96
CFI	0.9	0.98	0.98	0.97
PNFI	0.5	0.73	0.75	0.76
PGFI	0.5	0.61	0.65	0.65
CN	200.0	243.00	272.00	237.00
$\chi^2$ /df	3.0	2.93	2.46	2.82

GFI= Goodness-of-Fit Index    AGFI= Adjusted Goodness of Fit Index    RMSEA= Root Mean Square Error of Approximation    NNFI= Non-Normed Fit Index    CFI= Comparative Fit Index  
 PNFI= Parsimony Normed Fit Index    PGFI= Parsimony Goodness of Fit Index    CN= Critical N

This indicated that all 3 models could explain sport professionals' knowledge sharing behaviour. Nevertheless, a comparison of the index numbers found that the Theory of Planned Behaviour (TPB) model performed the best.

Regarding the path relationship among the dimensions in the 3 sharing behaviour models, a standardised coefficient was adopted for the path value to test hypotheses 1 to 6 in the research model (Table 3). Therefore, each hypothesis was verified and all were found to have a significant positive effect. To further explore the relationships between the 3 models in terms of knowledge sharing behaviour, the Theory of Reasoned Action (TRA) model was only affected by 'sharing intention' (0.74). In the Theory of Planned Behaviour (TPB) and the Modified Theory of Planned Behaviour (MTPB) models, the 'knowledge sharing intention' effect was the highest (0.56); followed by 'perceived behavioural control' (0.28.). For the knowledge sharing intention, there was no perceived behavioural control variable in the TRA model; 'attitudes' had the highest effect (0.43), followed by 'subjective norms' (0.25). In the TPB and the MTPB models, the 'knowledge sharing intention' was most affected by 'perceived behavioural control' (0.39 and 0.40 respectively), followed by 'attitudes' (0.30 and 0.32 respectively) and 'subjective norms' (0.13 and 0.12 respectively). In the MTPB model, the subjective norms also affected the 'attitudes' (0.61).

**TABLE 3: MODE OF HYPOTHESES AND PATH EFFECT**

Hypothesis	Path relationship	TRA	TPB	MTPB
H1	BI → BE	0.74*	0.56*	0.56*
H2	AT → BI	0.43*	0.30*	0.32*
H3	SN → BI	0.25*	0.13*	0.12*
H4	PBC → BI	—	0.39*	0.40*
H5	PBC → BE	—	0.28*	0.28*
H6	SN → AT	—	—	0.61*

AT=Attitudes Toward behaviour; SN=Subjective Norms; PBC=Perceived Behavioural Control

BI=Behavioural Intentions; BE=Behaviour \* p<0.05

TRA= Theory of Reasoned Action

TPB= Theory of Planned Behaviour

MTPB= Modified Theory of Planned Behaviour

In addition, a comparison of the explanatory power of the 3 models in terms of sport professionals' knowledge sharing intentions and behaviour, the TPB model was the most effective for 'knowledge sharing behaviour' ( $R^2=58\%$ ), followed by the MTPB model ( $R^2=57\%$ ). The TRA model had less explanatory capability ( $R^2=54\%$ ). With regard to 'knowledge sharing intention,' the TPB model had the best explanatory capability ( $R^2=47\%$ ), followed by the MTPB model ( $R^2=45\%$ ) and the TRA model ( $R^2=37\%$ ). In conclusion, for sport professional knowledge sharing behaviour models, the Theory of Planned Behaviour model was the best overall.

### Comparison of the knowledge sharing behaviour models of sport professionals in different occupational fields

Since the Theory of Planned Behaviour (TPB) model was the best at constructing sport professionals' knowledge sharing behaviour, it was used to explore sport professionals' knowledge sharing behaviour in different occupational fields. By means of a group mode, 210 people employed in academia and 217 employed in industry were selected from the sample. The indicator analysis results of the 2 groups showed that the model matched the goodness-of-fit evaluation indicator (GFI=0.92; NFI=0.93; CFI=0.97; CN=280;

RMSEA=0.044,  $\chi^2/df=1.81$ , meaning each met the standard). These results demonstrated the appropriateness of the multiple group sample data model.

To further explore whether there were any differences between industry and academia, 5 nested models established in AMOS were adopted as the method of analysis (Chen, 2007). The results of a comparison of the 5 aforementioned methods indicated how, under the same measurement path coefficient, the 2 groups did not show any significant differences, unlike the others (Table 4). Therefore, with the exception of the latent variables constructed by observed variables in industry and academia, significant differences were apparent.

**TABLE 4: ANALYSIS OF MULTI-GROUP MODEL**

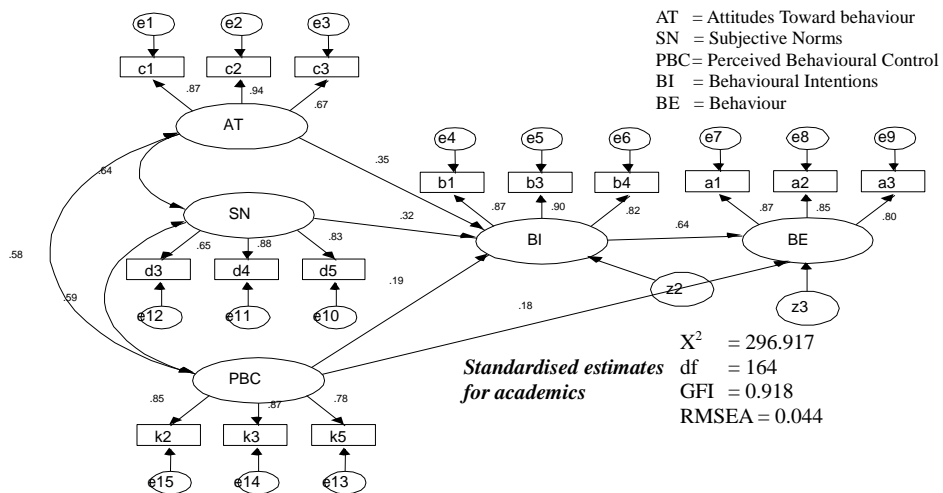
Model	df	$\chi^2$	p
Measurement weights	10	12.79	0.24
Structural weights	15	28.55*	0.02
Structural covariance	21	39.60*	0.01
Structural residuals	23	41.51*	0.01
Measurement residuals	38	68.04*	0.00

\* p<0.05

**TABLE 5: PATH EFFECTS OF DIFFERENT GROUPS OF ACADEMIA AND INDUSTRY**

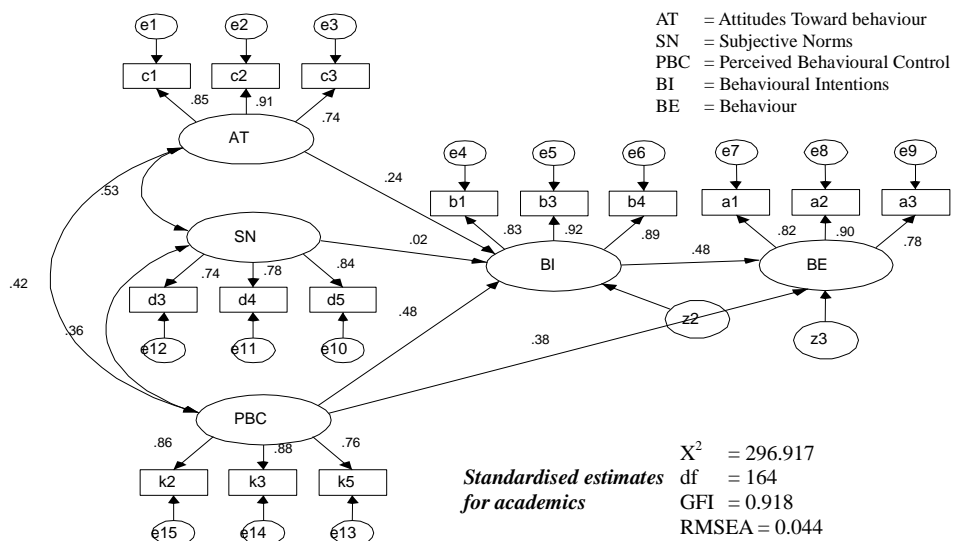
Path relationship	Total sample	Multiple group	
	(N=527)	Academia (n=210)	Industry (n=217)
AT → BI	0.30*	0.35*	0.24*
SN → BI	0.13*	0.32*	0.02
PBC → BI	0.39*	0.19*	0.48*
BI → BE	0.56*	0.64*	0.48*
PBC → BE	0.28*	0.18*	0.38*

\* p<0.05



**FIGURE 2: GROUP SHARING BEHAVIOUR MODEL FOR ACADEMIA**





**FIGURE 3: GROUP SHARING BEHAVIOUR MODEL IN THE INDUSTRY**

With regard to the *sharing behaviour* model in academia and industry (Table 5, Figure 2 & Figure 3), all met the standard, except for the 'subjective norms' of the industry behaviour mode. In terms of knowledge sharing intentions, in academia the 'attitudes' mode had the highest effect (0.35), followed by 'subjective norms' (0.32), while the 'perceived behavioural control' had the lowest effect (0.19). In the industry mode, 'perceived behavioural control' had the highest effect (0.48), followed by 'attitudes' (0.24); with 'subjective norms' having the lowest effect (0.02 did not reach significance). In terms of *knowledge sharing behaviour*, in both academia and industry, 'knowledge sharing intention' had the highest effect (0.64 and 0.48), followed by 'perceived behavioural control' (0.18 and 0.38). This showed that the knowledge sharing behaviours of academia and industry are indeed different. Therefore, Hypothesis 7 was confirmed.

## DISCUSSION AND CONCLUSIONS

In terms of the related behavioural research literature, the Theory of Reasoned Action, the Theory of Planned Behaviour and the Modified Theory of Planned Behaviour were adopted to explore sport professionals' model of sharing behaviour. The goodness-of-fit indicator and explanatory capability of the three models were also compared to find the best sport professional behaviour-sharing model. Next, the path relations of different group models were compared to provide a reference that could improve sport professionals' sharing behaviour and enhances the effectiveness and knowledge value of the sport and recreation industry.

The goodness-of-fit indicators of the Theory of Reasoned Action model, the Theory of Planned Behaviour model, and the Modified Theory of Planned Behaviour model, all met the standard. Research hypotheses 1 to 6 were confirmed. The path relations of all the

dimensions showed a significant positive effect. With regard to sport professionals' knowledge sharing behaviour, the above results indicate that personal attitudes, an enhanced ability to judge one's own capability, and gain support and encouragement, can increase one's knowledge sharing behavioural intentions, which will in turn increase knowledge sharing behaviour. In other words, behaviour was affected by behavioural intentions, and behavioural intentions were affected by behavioural attitudes, subjective norms and perceived behavioural control. This finding is consistent with the results of other relevant research (Ajzen, 1985, 1991; Madden *et al.*, 1992).

In addition, a comparison of the three models found that the Theory of Planned Behaviour model was more useful overall at providing a goodness-of-fit indicator. It also demonstrated a greater explanatory capability for knowledge sharing behaviours and intentions. The Theory of Planned Behaviour has been generally regarded as the most developed behavioural intention model, and the results of this study confirm this status. Therefore, the Theory of Planned Behaviour is the best model for constructing sport professionals' knowledge sharing behaviour.

The Theory of Planned Behaviour model was used in this research to explore and compare the knowledge sharing behaviour of sport professionals in different fields. A comparison of industry and academia showed significant differences, except for the established measure path coefficient. This indicated that knowledge sharing behaviours are indeed different for industry and academia. The relevant variables in this respect were the nature of the industry, employment relations, organisational culture, partner relationships and organisational tasks. Each of these influences the knowledge sharing attitudes, subjective norms, perceived behavioural control and sharing behaviour of professionals in different occupational fields. These findings are comparable to previous research (Hendriks, 1999; Lee, 2001; Bock & Kim, 2002; Hansen, 2002; Liao *et al.*, 2004). Hypothesis 7 was therefore confirmed.

In conclusion, the main finding was that the level of sharing behaviour by sport professionals in academia and industry was dependent on sharing intention and perceived behavioural control. Therefore, increasing sharing intention will increase sharing behaviour and perceived behavioural control influences sharing behaviour. This was more obvious in industry than in academia. Nevertheless, there was a significant discrepancy between academia and industry in terms of the variables that affect sharing intentions. The degree of sharing intentions among sport professionals in academia was dependent on the personal subjective opinion of the value of sharing. It was influenced by the relative amount of encouragement received from management and colleagues. For industry sport professionals, the level of sharing intention was conditional on the sharing ability of individuals and the subjective opinion of the shared value. In addition, in the industry sharing behaviour model, perceived behavioural control took on a very important role; this phenomenon may indicate that for those employed in the industry, knowledge sharing behaviour was a highly autonomous and subjective behaviour, and as such, was not easily influenced by its surrounding environment.

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