4-2003

Age differences in safety attitudes and safety performance in Hong Kong construction workers

Oi Ling SIU
Lingnan University, Hong Kong

David Rosser PHILLIPS
Lingnan University, Hong Kong

Tat Wing LEUNG
Lingnan University, Hong Kong

Recommended Citation

Siu, O.-l., Phillips, D. R., Leung, T.-w. (2003). Age differences in safety attitudes and safety performance in Hong Kong construction workers. Journal of Safety Research, 34(2), 199-205. doi: 10.1016/S0022-4375(02)00072-5

This is the post-printed version of an article. The final published version is available at Journal of Safety Research 34:2 (2003); doi: 10.1016/S0022-4375(02)00072-5
ISSN 0022-4375 (Print) / 1879-1247 (Online)

Age differences in safety attitudes and safety performance in Hong Kong construction workers

Oi-ling Siu
Lingnan University
David R. Phillips
Lingnan University
Tat-wing Leung
Lingnan University

Abstract

Problem: Safety in the construction industry is a major issue in Hong Kong, representing about 46% of all occupational injuries in 1998. This study explored linear and curvilinear relations between age and safety performance (accident rates and occupational injuries), as well as safety attitudes, in construction workers in Hong Kong. Method: A Chinese version of the Safety Attitude Questionnaire (SAQ by Donald & Canter) was developed and administered to a sample of Chinese construction workers (N=374, 366 males, 8 females) from 27 construction sites. Results: Accident rates were not related to age. Occupational injuries were related to age in a curvilinear manner, with injuries at first increasing with age, then decreasing. Two safety attitude scales were related to age with older workers exhibiting more positive attitudes to safety. If age and tenure are controlled, some attitude scales are predictors of safety performance. Impact on industry: Management/supervisors, team leaders, and workers are all responsible for safety, and any negative bias toward older construction workers is unfounded.

Keywords

Age; Safety attitudes; Safety performance; Accident/injuries; Construction workers

INTRODUCTION

The world's population is aging rapidly, which can be attributed to a number of interrelated factors, including the aging baby boomers, longer life expectancy, and especially, reduced total fertility rates. Consequently, older people will make up a larger proportion of the labor market in the near future almost everywhere, especially as retirement ages increase in some countries to compensate for labor shortages.

It has been well established in Western and Asian samples that age is associated with employee work well-being and specifically with job satisfaction (e.g., Birdi et al., 1995, Clark et al., 1996 and Siu et al., 2001). In general, older workers tend to be better adjusted to work, as reflected in job satisfaction. Some studies have found linear effects with job satisfaction increasing with age (e.g.,

This is the post-printed version of an article. The final published version is available at Journal of Safety Research 34:2 (2003); doi: 10.1016/S0022-4375(02)00072-5
ISSN 0022-4375 (Print) / 1879-1247 (Online)

White & Spector, 1987). Others have found a curvilinear pattern, with job satisfaction at first declining and then increasing with age (e.g., Clark et al., 1996). However, there are relatively fewer investigations on age differences in safety attitudes and safety performance. The issue of age and employee susceptibility to injury and illness has therefore become even more important (Topf, 2000).

Employee safety is costly in many terms, especially economically and legally. A large amount of money is lost due to occupational accidents. Improvements in safety in the workplace are often necessary for economic and legal reasons. Although it has been well documented that age and accident rates are negatively related (probably because older workers are more experienced on the job and have greater job knowledge, patience, and skills than younger counterparts; Frone, 1998, Kingsma, 1994, Stalneker, 1998 and Topf, 2000), when injuries do occur, older workers are usually more severely hurt, and fatalities occur more frequently among older workers (Topf, 2000). However, as concluded by Czaja (2001), information regarding aging and work performance is limited, and the information that is available is somewhat contradictory.

The challenge to the safety professional is finding ways to make older employment both more rewarding and safer Brewington & Nassar-McMillan, 2000 and Stalneker, 1998. This will likely lead to better job performance, reduced occupational injuries and illness, and, of course, increased economic efficiency for employing enterprises. Topf (2000) analyzes some of the possible reasons why younger workers may be at increased risk of work-related injury: limited job knowledge, training, and skills, and perhaps less sense of responsibility. These factors all point to the importance of safety attitudes in performing safely at work.

Safety attitudes and safety performance

Due to changes to the physical environment and to working conditions of employees (which are known as "human factors"; Donald, 1994 and Donald & Canter, 1993), particular attention has been paid to the physical and cognitive characteristics of jobs. The application of the ergonomic methodology and principles has led to great improvements in industrial safety. However, many organizations have found that their accident rates level off after periods of continuing improvement. This has stimulated a search for new methods and approaches and a growing interest in social–psychological factors, particularly safety attitudes (Donald & Canter, 1994).

Donald and Canter (1993) proposed using the attitudinal approach, particularly with respect to safety attitudes, to address this concern. This approach starts from a basic premise: "a large number of accidents are under the control of those involved in them. The people involved may not intend to have an accident, but the behavior that leads them to the accident is intentional, and they are aware of what they are doing. This is in contrast to the idea that an accident happens because

This is the post-printed version of an article. The final published version is available at Journal of Safety Research 34:2 (2003); doi: 10.1016/S0022-4375(02)00072-5
ISSN 0022-4375 (Print) / 1879-1247 (Online)

of some momentary lapse of concentration or slip" (Donald & Canter, 1993, p. 5). They developed a Safety Attitude Questionnaire (SAQ) to measure attitude, which had 16 subscales. The rationale was that surveying workers' safety attitudes, using questionnaires as measurement instruments, appear to be similar to management safety audits.

Donald and Canter (1993) conducted safety research using the SAQ in more than 40 companies over 6 years and concluded from their research that it is possible to measure attitudes toward safety in a valid and reliable way and that attitudes are indeed predictive of safety performance. Young, Donald, and Chalk (1997) used the SAQ to demonstrate the success of an intervention study to improve organizational safety performance of a major UK electricity generating company. Some researchers developed more measures of perceptions of workplace safety that related to accident-related variables, such as accident rates, anxiety, and employees' safety behaviors (e.g., Hayes, Perander, Smecko, & Trask, 1998). For instance, Hayes et al. (1998) reported that supervisory safety practices and management safety practices were the best predictors of job satisfaction. The implication of these results is that, if a department's safety attitudes are surveyed, it should be possible to predict the likely accident rates within that department and to take proactive corrective action.

The present study

Aging issues are extremely evident in a number of Asia Pacific countries such as Hong Kong, Singapore, Taiwan, Korea, and China (Phillips, 2000). In Hong Kong, although the number of workers aged 45 and above is not yet rapidly increasing, the proportion of the population aged 50 or above is projected to shoot up in the coming three decades, from about 25% in 1999 to over 37% in 2029 (Census and Statistics Department, 1998). However, the shortage of younger workers in Hong Kong is unlikely to be as problematic as in some Western societies, because there is generally an inflow of younger workers from Mainland China. Under this scenario, the labor market in Hong Kong will remain competitive, and the increasing number of older workers in Hong Kong will need to compete with the newly arrived younger workers from the mainland. Their safety and well-being may therefore be neglected.

As in many countries, safety has always been a major issue and is often a problem in the construction industry in Hong Kong. Thousands of people are killed annually in industrial accidents in Hong Kong, and the number of disabling injuries is a staggering figure. For example, from January 1998 to March 1999, there were 35,986 cases of industrial accidents (refer to injuries and deaths arising from industrial activities in an industrial undertaking) in all industrial undertakings in Hong Kong. Construction employees in Hong Kong incurred approximately 46% of all annual occupational injuries (refers to injury cases, including those of industrial accidents, arising from work accidents, resulting in death or incapacity for work of over three consecutive

This is the post-printed version of an article. The final published version is available at Journal of Safety Research 34:2 (2003); doi: 10.1016/S0022-4375(02)00072-5
ISSN 0022-4375 (Print) / 1879-1247 (Online)

days). The annual accident rate per 1,000 workers in construction industry was 249 in 1998 and 199 in 1999 (Census and Statistics Department, 1998, 1999).

Hong Kong's construction industry enjoyed a golden period due to the rapid development of property estates in the past two decades. However, after the 1997 Asian financial crisis, the unemployment rate among construction workers rose. In Hong Kong, age discrimination in employment is against the law but there are nevertheless many perceived and actual obstacles to older workers searching for jobs, one of which is employers' negative perceptions of older workers. They might think older workers are not physically fit and are reluctant to adopt the safety procedures suggested by line management or team leaders.

Many studies have been conducted in developing safety measures for different industry groups in Western societies (e.g., Dedobbeleer & Beland, 1991, Donald & Canter, 1993 and Hayes et al., 1998), but their cross-cultural implications are not known. The purpose of this research is to study the linear and curvilinear relationships between age and safety performance (accident rates and occupational injuries) and safety attitudes among construction workers in Hong Kong by adapting a Western measure of safety attitudes. The present study is one of few conducted in a Chinese society to investigate these linear and curvilinear relationships. The outcome will therefore provide at least initial cross-cultural evidence.

Method

1. Sample and procedures for the survey

A purposive sampling method was used to contact as many construction sites as possible in the three main regions of Hong Kong: Hong Kong Island, Kowloon, and the New Territories. The researchers obtained permission from the managing directors of four companies to proceed with data collection.

The data were collected from 374 workers from 27 construction sites between February and May 2000. Face-to-face surveys with workers were used, and participants were paid a token of HK$50 (US$7) to compensate for their time spent completing the questionnaires.

2. The survey instrument

The 12 subscales of the Safety Attitudes Questionnaire (SAQ) by Donald and Canter (1993) were used to measure safety attitudes. The SAQ was used because it has demonstrated its validity and reliability in many European countries. The scales were translated into Chinese by a professional translator using a back-translation method. Items measuring accident-related performance and demographic factors were also included in the questionnaire. The different safety attitude subscales comprised:

This is the post-printed version of an article. The final published version is available at Journal of Safety Research 34:2 (2003); doi: 10.1016/S0022-4375(02)00072-5
ISSN 0022-4375 (Print) / 1879-1247 (Online)

A.

Shopfloor satisfaction with the safety system (three items): The degree to which employees express themselves as satisfied with specific aspects of the safety system such as safety equipment, safety precautions, and safety procedures (e.g., "My workmates are satisfied with the safety procedures in general").

B.

Housekeeping and safety equipment (four items): Employees assess general housekeeping and checking of safety equipment (e.g., "Before I start work, I check the safety equipment I might need").

C.

Shopfloor encouragement and support (four items): Employees assess the degree of interpersonal support and encouragement that they and their workmates afford each other (e.g., "The people I work with encourage me to work safely").

D.

Shopfloor training (three items): Employees assess their knowledge of their training needs together with their satisfaction with the adequacy of the training they have had (e.g., "I feel satisfied with the attention given to safety in any training I have had").

E.

Level of safe working behavior (two items): This scale relates to employees' rating of how safely they believe themselves to work in general (e.g., "Overall, I think I work safely").

F.

Safety meetings (five items): Employees rate the level of involvement they have in meetings, which involve discussions about safety, satisfaction with these meetings, and their knowledge about what has been discussed in Safety Committee Meetings (e.g., "I'm encouraged by my supervisors to go to meetings which involve discussions about safety").

H.

Safety information (three items): The success with which safety information in general, including aspects such as results of safety inspections, is communicated to employees (e.g., "The people I work with are satisfied with the information they get about safe working").

M3.

Management/supervisor encouragement and support (three items): Employees appraise the degree of support and encouragement that they receive from management and their supervisors (e.g., "My supervisors encourage me to report any safety problems I might notice").

M4.

Pressure from management/supervisor (four items): Employees evaluate the pressures that operate to encourage them to infringe safety regulations, and relate these to their understanding of their job, and their actions in carrying it out (e.g., "The management in the company puts productivity

This is the post-printed version of an article. The final published version is available at Journal of Safety Research 34:2 (2003); doi: 10.1016/S0022-4375(02)00072-5
ISSN 0022-4375 (Print) / 1879-1247 (Online)

before safe working").

TL1.

Team leader practice (six items): Employees assess their team leader in terms of the interpersonal support they receive from them, as well as the degree to which they enforce following safe working procedures (e.g., "My team leader talks to me about safe working procedures").

TL2.

Team leader satisfaction with the safety system (five items): Employees rate their team leader's satisfaction with the safety system (e.g., "My team leader is satisfied with the safety training given to our work group").

TL3.

Team leader knowledge with the safety system (three items): Employees rate their team leader's knowledge with the safety system (e.g., "My safety officers know about most aspects of safe working in their area").

These were measured on a 7-point Likert-type scale where 1=very strongly disagree and 7=very strongly agree.

3. Safety performance: accident rates and occupational injuries

Two questions were used to collect information about accident rates: "Have you ever been involved in an accident, or incident, of any kind at work, in the last 6 months? Yes or No."; "If yes, how many times?" One question was used to measure occupational injuries: "How many times have you suffered from the following injuries, in the last 6 months? Strains or sprains, cuts or lacerations, burns, bruises, or contusions, fractured bone, dislocated joint, other injuries." A 6-point scale was used ranging from 1=never to 6=five times or more.

4. Demographic factors

Items used to collect the personal information about the respondents included age, gender, apprenticeship (yes or no), years of training, and working experience in the current company and present job.

Results

1. Sample distributions

The response rate for successfully completed questionnaires was 89.3%. Of the 374 respondents, 97.9% were male (n=366) and only 2.1% were female (n=8). The mean age was 34.7 years (SD=10). The mean length of tenure for employment in the current company was 3.2 years (SD=3.0, range=0.08–20 years) and, for the present job, was 8.1 years (SD=7.9, range=0–40 years). In terms of training record, the mean duration training was 0.7 years (SD=1.3, range=0–12 years).

2. Safety performance

This is the post-printed version of an article. The final published version is available at Journal of Safety Research 34:2 (2003); doi: 10.1016/S0022-4375(02)00072-5
ISSN 0022-4375 (Print) / 1879-1247 (Online)

About 17% (n=63) of the respondents reported that they had been involved in an accident, or incident, of any kind at work, in the last 6 months. Of the 54 respondents, 15% reported that they had been involved in a near miss of any kind at work in the last 6 months. Among the seven kinds of occupational injuries, the most common injury suffered in the last 6 months was bruises/contusions (28.7%, n=105), followed by strains/sprains (28.5%, n=104).

3. Validity and reliabilities of scales

The validity of the structure of safety attitudes was demonstrated by Smallest Space Analysis, showing three facets: organizational role (with self, workmates, team leader, line management, and safety officers as elements), safety object (with passive and active safety referents as elements), and behavioral modality (with cognitive, affective, and behavioral as elements; Siu, 2001). Table 1 presents the means, standard deviations, and coefficient alphas for the scales. All of the reliabilities are acceptably high, ranging from .61 to .82.

Table 1
Means, standard deviations, and reliabilities of scales

Items	Alpha	Mean	*SD*	Range
A (3)	.77	14.76	2.29	6–21
B (4)	.71	19.88	3.04	10–28
C (4)	.82	20.08	3.28	8–28
D (3)	.67	14.48	2.06	8–21
E (2)	.74	10.08	1.73	4–14
F (5)	.77	23.87	3.75	13–35
H (3)	.72	14.46	2.31	6–21
M3 (3)	.68	14.30	2.50	7–21
M4 (4)	.77	17.28	4.13	4–28
TL1 (6)	.61	28.28	3.56	15–39
TL2 (5)	.76	24.48	3.35	13–35
TL3 (3)	.76	15.33	2.24	9–21

A = shopfloor satisfaction with safety system, B = housekeeping and safety equipment, C = shopfloor encouragement and support, D = shopfloor training, E = level of safe working behavior, F = safety meeting, H = safety information, M3 = management/supervisor encouragement and support, M4 = pressure from management/supervisor, TL1 = team leader practice, TL2 = team leader satisfaction with the safety system, TL3 = team leader knowledge with the safety system.

4. Relationships among age, safety attitudes, and safety performance

Since tenure in the current company and training record were not found to be related to age or any of the main variables at all, subsequent analysis only included tenure (in terms of overall working experience in present job) as a control variable. Table 2 shows the intercorrelations among age, tenure, and the main variables. Five out of 12 safety attitude subscales , , , and were statistically significantly correlated with accident rates (self-reported measure of the number of times they had been involved in an accident in the last 6 months). Eight attitude subscales correlated with occupational injuries (self-reported measure of the number of times they had suffered from strains or sprains, cuts or lacerations, burns, bruises, or contusions, fractured bone, dislocated joint, or other injuries; , , , , , , and). Table 2 also shows that age and two safety attitudes and were positively related. In other words, older workers showed more positive safety attitudes than younger ones. Interesting enough, age was not related to safety performance (accident rates or occupational injuries) within the sample. In addition, tenure was found to be positively related to age, safety attitudes and), accident rates, and occupational injuries.

This is the post-printed version of an article. The final published version is available at Journal of Safety Research 34:2 (2003); doi: 10.1016/S0022-4375(02)00072-5
ISSN 0022-4375 (Print) / 1879-1247 (Online)

Table 2
Intercorrelations among variables

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1. A	–															
2. B	.62***	–														
3. C	.44***	.56***	–													
4. D	.65***	.51***	.50***	–												
5. E	.67***	.48***	.38***	.51***	–											
6. F	.62***	.64***	.55***	.65***	.55***	–										
7. H	.71***	.62***	.46***	.66***	.56***	.72***	–									
8. M3	.53***	.54***	.62***	.53***	.54***	.63***	.55***	–								
9. M4	.24***	.24***	.28***	.21*	.26***	.23***	.19***	.33***	–							
10. TL1	.53***	.47***	.51***	.58***	.48***	.55***	.43***	.65***	.21**	–						
11. TL2	.56***	.49***	.53***	.66***	.55***	.64***	.61***	.70***	.30***	.69***	–					
12. TL3	.50***	.48***	.50***	.55***	.43***	.56***	.53***	.62***	.30***	.61***	.76***	–				
13. ACCIRATE	−.14**	−.02	−.09	−.05	−.14**	−.03	−.05	−.15**	−.17**	−.15**	−.08	−.01	–			
14. OCCINJ	−.12*	−.14**	−.12*	−.09	−.16**	−.15**	−.12*	−.15**	−.05	−.07	−.15*	−.10	−.09	–		
15. Age	.09	.12*	.05	.05	.05	.07	.07	.11*	.05	−.07	.08	.05	−.06	.01	–	
16. Tenure	.05	−.01	−.08	.06	.08	−.13*	−.01	.07	.09	.13*	.03	−.02	−.12*	.14**	.28***	–

A = shopfloor satisfaction with safety system, B = housekeeping and safety equipment, C = shopfloor encouragement and support, D = shopfloor training, E = level of safe working behavior, F = safety meeting, H = safety information, M3 = management/supervisor encouragement and support, M4 = pressure from management/supervisor, TL1 = team leader practice, TL2 = team leader satisfaction with the safety system, TL3 = team leader knowledge with the safety system, ACCIRATE = accident rates, OCCINJ = occupational injuries.

* $p < .05$.
** $p < .01$.
*** $p < .00$.

5. Relations of age with safety performance accounted for by safety attitudes and tenure

To test for linear and nonlinear relations between age and safety performance (accident rates or occupational injuries), similar hierarchical multiple regression procedures adopted by Siu et al. (2001) were employed by entering age, age squared, and tenure into the equation in the first step. The measure of safety performance (accident rates and occupational injuries in respective equations) was regressed by adding the 12 safety attitude subscales in the second step. In relation to accident rates, age, age squared, and tenure were nonsignificant in the first step. In the second step, safety attitudes with three significant subscales , and accounted for 10% of the variance explained, while controlling for age, age squared, and tenure (see Table 3).

Table 3
Summary of regression results for models of the effects of explanatory variables on two safety performance measures

Predictor	Beta			
	Accident rates		Occupational injuries	
	Step 1	Step 2	Step 1	Step 2
Demographic variables				
Age	.20	.36	.46	.63*
Age^2	−.32	−.49	−.52	−.70*
Tenure in present job	.10	.11	.10	.15*
Safety attitudes				
A	–	−.16	–	.03
B	–	.11	–	−.02
C	–	−.03	–	.01
D	–	.07	–	.05
E	–	−.03	–	−.16*
F	–	.05	–	−.06
H	–	.11	–	.05
M3	–	−.03	–	−.09
M4	–	−.19**	–	.04
TL1	–	−.22**	–	.18
TL2	–	−.06	–	.14
TL3	–	.21*	–	−.01
R^2	.01	.11	.01	.07
Change in R^2	–	.10	–	.06
Overall F	1.49	2.34**	1.39	1.79*
n	340	293	321	277

* $p < .05$.
** $p < .01$.

In relation to occupational injuries, age, age squared, and tenure were nonsignificant in the first

This is the post-printed version of an article. The final published version is available at Journal of Safety Research 34:2 (2003); doi: 10.1016/S0022-4375(02)00072-5
ISSN 0022-4375 (Print) / 1879-1247 (Online)

step. In the second step, a curvilinear relationship was demonstrated between age and occupational injuries. In other words, only for the relationship between safety attitudes and occupational injuries was the quadratic component significant (age with occupational injuries). When plotted, the form of this relation was an inverted U shape, with occupational injuries at first increasing with age and then decreasing. Together with tenure and one safety attitude subscales (E), they accounted for 6% of the variance explained.

Discussion

The purpose of the study was to explore the linear and curvilinear relationships between age and safety performance among construction workers in Hong Kong by adapting a Western-developed SAQ. The Chinese version of the 12 subscales of the SAQ was found reliable and valid. This provides cross-cultural evidence of the SAQ developed by Donald and Canter (1993). From this research, it can be seen that some older workers do indeed have more positive attitudes toward safety, compared with younger workers. Older workers are more satisfied with and more likely to assess general housekeeping and checking of safety equipment (B) in a positive way, and perceive more encouragement and support from management/supervisor (M3). It seems that the SAQ could be used as a diagnostic tool in assessing construction workers' safety attitudes to predict accident rates and occupational injuries, so that proactive corrective action can be taken.

Concerning accident rates, age appears to have no linear or curvilinear relation with prevalence of accidents. However, although age has no linear relationship with occupational injuries, age has a curvilinear effect on occupational injuries in which the frequency of injury increases with age first, then declines. Furthermore, older workers are more experienced and therefore they have decreased risk at work. Another reason may be that older workers are aware that fewer job opportunities are available for them, so they are more committed at work and are willing to comply with safety rules. Nevertheless, the amount of variance accounted for was quite small. The remaining unique variance may include other human factors such as safety climate (including communication) and psychological strains (Siu, Phillips, & Leung, 2003).

The results obtained from hierarchical multiple regressions also revealed that pressure from management/supervisor in encouraging them to infringe safety regulations (M4) was a significant predictor of accident rates after controlling for age and tenure. Furthermore, team leader's practice (TL1) and knowledge with the safety system (TL3) were significant predictors of occupational injuries while controlling for age and tenure. These results are in line with previous research demonstrating the importance of management safety in predicting accident-related variables (Hayes et al., 1998). Therefore, all agents, including the construction workers themselves, the supervisor, and the team leader, are responsible for safety performance. At the senior management level, managers/supervisors should encourage workers to conform to safety regulations. At the

This is the post-printed version of an article. The final published version is available at Journal of Safety Research 34:2 (2003); doi: 10.1016/S0022-4375(02)00072-5
ISSN 0022-4375 (Print) / 1879-1247 (Online)

middle management level, team leader's practice and knowledge of safety system should receive more attention in promoting safety.

One interesting result obtained from the study was that tenure (length of time on the job) was a significant predictor of occupational injuries; more tenure equals more reported injuries. One possible explanation may be that workers with longer working experience are more likely to comply with rules and were more open to reporting minor injuries at work. Perhaps workers with less working experience were more likely to hide injuries that occurred.

In line with many studies conducted in Western societies, the results of the present study provide little support for the widely held belief that safety performance declines significantly with age. The implications of the study are that older construction workers in Hong Kong are quite capable of learning safety regulations and safety system at work, and are willing to comply with safety regulations. Perhaps it is attributable to the fact that job knowledge structures increase with age and compensate for declines in ability. The other implications of the study are that employers in the construction industry should not have negative age stereotypes toward older workers. Instead, to accommodate older persons in the workplace, employers must acknowledge that these workers are a valuable resource. They should accept the fact that older construction workers could be more knowledgeable and experienced, displaying more positive attitudes to safety, and possibly more committed to work than younger workers.

During the last few decades, safety professionals in Hong Kong and the region have not paid much attention to older workers since this group was relatively small. However, as noted, there will be a mix of older and younger workers in Hong Kong in the foreseeable future, so safety policies and procedures that are based on a young workforce should be reevaluated in order to accommodate and anticipate this generational mix in different occupational groups. As suggested by Czaja (2001), the costs associated with additional training or extended practice may be offset by lower turnover and absenteeism among older people. Training strategies may need to be modified for older workers so that they can learn more efficiently.

REFERENCES

Birdi, K., Warr, P., & Oswald, A. (1995). Age differences in three components of employee well-being. Applied Psychology: An International Review, 44, 345 – 373.

Brewington, J. O., & Nassar-McMillan, S. (2000). Older workers: Workrelated issues and implications for counseling. Career Development Quarterly, 49, 2 – 15.

Census and Statistics Department (1998). Hong Kong annual digest of statistics. Hong Kong, China: Author.

Clark, A., Oswald, A., & Warr, P. (1996). Is job satisfaction U-shaped in age? Journal of

Occupational and Organizational Psychology, 69, 57 – 81.

Czaja, S. J. (2001). Technological change and the older workers. In J. E. Birren, & K. W. Schaie (Eds.), Handbook of the psychology of aging (5th ed.) (pp. 547 – 568). San Diego, CA: Academic Press.

Dedobbeleer, N., & Beland, F. (1991). A safety climate measure for construction sites. Journal of Safety Research, 22, 97 – 103.

Donald, I. (1994, March). Measuring psychological factors in safety. Safety and Health Practitioner, 26 – 29.

Donald, I., & Canter, D. (1993, November). Attitudes to safety: Psychological factors and the accident plateau. Health and Safety Information Bulletin, 215, 5 – 8.

Donald, I., & Canter, D. (1994). Employee attitudes and safety in the chemical industry. Journal of Loss Prevention in the Process Industries, 7, 203 – 208.

Frone, M. R. (1998). Predictors of work injuries among employed adolescents. Journal of Applied Psychology, 83, 565 – 576.

Hayes, B. E., Perander, J., Smecko, T., & Trask, J. (1998). Measuring perceptions of workplace safety: Development and validation of the Work Safety Scale. Journal of Safety Research, 29, 145 – 161.

Kingsma, J. (1994). Causes of occupational injuries. Perceptual and Motor Skills, 79, 1025 – 1026.

Phillips, D. R. (2000). Ageing in the Asia-Pacific region. London: Routledge.

Siu, O. L. (2001). A study of safety climate, work stress, and safety performance among construction workers in Hong Kong: A facet approach.

In D. Elizur (Ed.), Facet theory: Integrating theory construction with data analysis (pp. 311 – 322). Prague, Czech Republic: MATFYZ PRESS.

Siu, O. L., Phillips, D. R., & Leung, T. W. (2003). Safety climate and safety performance among construction workers in Hong Kong: The role of psychological strains as mediators. Accident Analysis and Prevention, 958, 1 – 8.

Siu, O. L., Spector, P. E., Cooper, C. L., & Donald, I. (2001). Age differences in coping and locus of control: A study of managerial stress in Hong Kong. Psychology and Aging, 16, 707 – 710.

Stalneker, C. K. (1998). Safety of older workers in the 21st century. Professional Safety, 43, 28 – 31.

Topf, M. D. (2000). General next? Occupational Hazards, 62, 49 – 50. White, A. T., & Spector, P. E. (1987). An investigation of aged-relation factors in the age –job satisfaction relationship. Psychology and Aging, 2, 261 – 265.

Young, S., Donald, I., & Chalk, J. (1997). Safety teams: Using team work to improve organizational performance. Occupational Psychologist, 31, 5 – 10.