UNIVERSITI TEKNOLOGI MARA

INTERNATIONAL JOURNAL OF SOCIAL PLANNING AND DEVELOPMENT

VOLUME 1 (1) DECEMBER 2011 ISSN : 1985-3092

Penerbitan Oleh: Universiti Teknologi MARA (Perak)

INTERNATIONAL JOURNAL OF SOCIAL PLANNING AND DEVELOPMENT VOLUME 1 (1) DECEMBER 2011

EVALUATING FEAR OF CRIME IN NEIGHBOURHOOD: A STRUCTURAL EQUATION APPROACH

Siti Rasidah Md Sakip, Aldrin Abdullah, Noraini Johari and Mohd Najib Mohd Salleh

ABSTRACT

Fear of crime is based on three preferences which are crime-specific, crime problems in neighbourhood and environmental factors such as physical disorder, social disorder and victimization. Most findings by the researcher found that those dimensions show a high level of reliability to measure the fear of crime. Therefore, in this paper the dimensions of fear of crime were tested using confirmatory factor analysis with a series of measurement model. The validation and confirmation of the fear of crime construct was done using Confirmatory Factor Analysis (CFA) via AMOS. Nineteen items were initially involved in measuring the three categories of fear of crime dimensions, but six items were excluded from the list of variable indicators of the fear of crime dimensions because these items have a factor loading below 0.3. The results of this study indicate that the crime problems in neighbourhood (CPN) and environmental factors (EF) dimensions achieved good fit indices where the values for GFI, TLI and CFI exceeded 0.90 and the RMSEA value was less than 0.05. The CPN dimension on the other hand, was found to be the best indicator to measure fear of crime in neighbourhoods with the value of standardized coefficients at r=0.91.

Keywords: crime, fear of crime, environmental, confirmatory factor analysis, structural equation modeling

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INTRODUCTION

Beginning from the late 1960s, fear of crime has become a major social problem demanding scientific understanding and social reaction (Renauer, 2007). Therefore, fear of crime has attracted a significant amount of research interest in recent years since it was developed as a research focus in the UK (Evans & Fletcher, 2000). Social research in Europe, North America and elsewhere regularly find widespread fear of crime (Gray, Jackson, & Farrall, 2008). Studies such as the European Social Survey, the British Crime Survey and the International Crime Victim Survey all substantiate the view that all across Europe fear of crime is common and a problem in its own right, separate from crime itself (Hale, 1996).

Prior research posits three dominant factors to explain citizens' fear of crime namely crime problems in neighbourhoods (Farrall & Gadd, 2004; Roh & Oliver, 2005), crime-specific (British Crime Survey, 2005, , 2008; Gray, Jackson, & Farrall, 2008) and environmental factors (Franklin & Franklin, 2009; Nasar & Fisher, 1993; Ross & Jang, 2000). These dimensions of fear of crime were found to have a high internal reliability level that is a Cronbach alpha value of between 0.07 to 0.08 (Franklin & Franklin, 2009; Renauer, 2007). In this study, those dimensions were tested using a series of confirmatory factor analysis (CFA) models to develop a measure of fear of crime that can be used among individuals and community's feelings of fear. These CFA models are based on the factor structured on the basis of a 'good' theory of fear of crime to determine whether there is empirical support for the theoretical factor fear of crime. This study has implications for future measurement of fear of crime for individuals, particularly in residential communities.

LITERATURE REVIEW

Fear of crime affects far more people in the United States than crime itself, and there are sound reasons for treating crime and fear of crime as distinct social problems (Warr, 2000). The same scenario can be seen in Malaysia where fear of crime is high even though the crime rate has declined (USM, 2008). The phrase 'fear of crime' has been equated with a variety of emotional states, attitudes or perceptions including mistrust of others, anxiety, perceived risk, fear of strangers, concern about deteriorating neighbourhoods or declining national morality (Warr, 2000). There are some definitions of fear of crime by prior researchers, LaGrange, Ferraro and Supancic (1992) who defined fear as negative

emotional reactions generated by crime or symbols associated with crime. According to Warr (2000), fear is not a perception of the environment, but a reaction to the perceived environment. Although fear may result from the cognitive processing or evaluation of perceptual information and fear is not in itself a belief, attitude or evaluation. Fear of crime has a relationship with emotional reaction, a feeling of fear and wariness towards any action that may bring about injury as a result of being assaulted (Pain, 2000; Ross & Jang, 2000). According to Pain (2000), fear is the manifestation of a feeling that one is in danger. Some studies have postulated that fear of crime is assumed to be signs or symbols of criminal victimization (Lee, 2001; Stephen, Emily, & Jonathan, 2007) as the frequency of one becoming a victim of crime will induce a higher feeling of fear of crime (Gray, Jackson, & Farrall, 2008). Nevertheless, individual understanding of fear of crime differs as it depends on the situation in which one feels fear of crime (Schneider & Kitchen, 2007), design and the environment (Spinks, 2001) as well as their psychological and social life factors (Minnery & Lim, 2005).

Numerous theoretical developments have sought to explain the various dynamics of fear of crime. In this study fear of crime was measured using three preferences; (a) crime problems in neighbourhoods to measure crime problems in neighbourhoods; (b) crime-specific and; (c) environmental factors. Crime problems in neighbourhoods were measured by asking respondents to rate how big the crime problem is in their neighbourhoods (Gibson, Zhao, Lovrich, & Gaffney, 2002) within a period of 12 months with regards to the following: (a) house breaking or theft, (b) vehicle theft, (c) acts of vandalism such as broken windows, damage to public property, (d) drug dealing; and (e) physical assault on individuals. Conversely, crime-specific measures a respondent's general sense of safety (Ferraro & LaGrange, 1987). The measure taps emotional fear by asking respondents how often they worry about specific types of crime. The specific questions used to create this measure of fear come from the British Crime Survey (2005) and Renauer (2007) who asked respondents, " Within a period of 12 months, how much do you worry about the following: (a) house breaking, (b) physical assault, (c) vehicle theft, (d) sexual harassment and (e) rape. Responses were based on a Likert-type scale continuum from 1 (not worried at all) to 8 (extremely worried).

The basic assumption in environmental factors construct is that neighbourhood incivilities are the manifestations of physical and social disorders that threaten individual residents more than the actual experience of crime (Worral, 2006). Physical disorder refers to disorderly surroundings such as abandoned cars, vandalized property, trash, vacant houses and deteriorated homes (Nasar & Fisher, 1993; Painter, 1996). Social disorder refers to disruptive elements such as, public drunkenness, drug addiction, prostitution, juvenile loitering, delinquent behaviour and homelessness (Joseph, 1997; Nasar & Fisher, 1993; Perkins, Weeks, & Taylor, 1992; Renauer, 2007). Neighbourhood residents who perceived disordered social and physical local surroundings are more likely to exhibit higher levels of fear (Lewis & Salem, 1986; Skogan, 1990; Wilson & Kelling, 1982). Research on fear of crime has consistently found a positive relationship between neighbourhood disorders and fear (Renauer, 2007). Meanwhile, direct victimization such as hearing news of crime either experiences of being a crime victim among relatives, friends, neighbours or from the media also increases fear of crime (Banks, 2005; Ferguson & Mindel, 2007; Nasar & Fisher, 1993). According to Reid (2000), a person who has never been a victim of crime may also exhibit fear of crime. In fact this type of people is said to feel a higher level of fear as compared to a real crime victim (Farrall & Gadd, 2004; Skogan & Maxfield, 1981). Indirect victimization is caused by a traumatic feeling and fear on personal safety should become a victim of crime (Reid, 2000).

Environmental factors have been divided into three main dimensions - physical disorder, social disorder and indirect victimization. These dimensions were measured by the following questions: "In a period of 12 months, how far do you agree with the following statements: (a) I am fearful when confronted with acts of vandalism, (b) I am fearful when I walk near overgrown areas or dense undergrowth, and (c) I am fearful when I walk in abandoned housing estates". Social disorder was measured by the following questions: "(a) I am fearful when I come across loiterers, (b) I am fearful when I run into drunkards, and (c) I am fearful when I come across homeless people". Direct victimization was measured by the following questions: "(a) I am fearful when I hear news of crime in the media, (b) I am fearful when I hear accounts or experiences of being crime victims from friends or neighbours, and (c) I always relive visuals of crime after reading news of acts of crime". Responses were based on a Likert-type scale continuum from 1 (strongly disagree) to 8 (strongly agree).

All these dimensions have been analyzed using confirmatory factor analysis (CFA). CFA is a tool that enables to either "confirm" or "reject" the items to measure the construct. In CFA, a measurement model is used to test how specific variables logically and systematically represent constructs involved in a theoretical model (Hair, Black, Babin, & Anderson, 2006). In other words, measurement model specifies a series of relationships that suggest how measured variables represent a latent construct that is not measured directly. Compared to the use of exploratory factor

analysis (EFA), the factors are derived from statistical results and not from theory. This means that the researchers run the software and let the underlying pattern of the data determines the factor structure. Thus, EFA is conducted without knowing how many factors really exist or which variables belong with which constructs (Hair et al., 2006).

METHODOLOGY

The respondents in this study come from a population survey of 476 residents in Presint 9B Putrajaya and Seksyen 4, Bandar Baru Bangi, Selangor Malaysia. Only 171 residents participated in the questionnaire survey. A face to face interview was conducted in this study to ensure that the respondents truly understood the questions that were asked. The respondents involved in this study comprised home owners or the main breadwinners of the household. Therefore, either the husband or the wife was chosen to be the study's respondents. The survey was undertaken from Monday to Sunday, beginning from 9 am to 7 pm. In the event respondents could not be interviewed during working days, an appointment for the survey was made on weekends or on days suggested by the respondents. The respondents required at least 30 to 40 minutes to comprehensively answer the questionnaires as stipulated by the duration required by Perkins *et al.*, (1992). If the respondents were not at home at the time of survey, a revisit was done at a different time and day. The maximum number of visits was set at 5 times, after which if the respondents were still unable to be interviewed it was assumed that the respondents were not interested to participate in the questionnaire survey.

RESULTS AND DISCUSSIONS

The main objective of this working paper was to conduct validation on the fear of crime construct which consisted of three main dimensions; (a) crime problems in neighbourhoods with five items, (b) crime-specific; which also has five items to measure the respective dimension and (c) environmental factors with 15 items to measure the respective dimension. The development of these items was based on previous research (Banks, 2005; British Crime Survey, 2005; Gibson, Zhao, Lovrich, & Gaffney, 2002; Nasar & Fisher, 1993; Painter, 1996; Renauer, 2007). All the items were measured using interval data within a Likert scale that comprised 8 answer choices (Alreck & Settle, 2004) of (1) highly unproblematic to (8) highly problematic for crime problems in neighbourhoods dimension, (1) not fearful at all to (8) extremely fearful for crime-specific dimension and (1) highly disagree to (8) highly agree for environmental factors dimension.

The validation for fear of crime construct was done by conducting a confirmatory factor analysis (CFA) using AMOS and SPSS software. CFA is a measurement model which is developed by the correlation between latent variables and several indicators (items) or known as variable and error manifests. The CFA method is able to ensure and validate the items used in measuring latent variables by taking into account the value of the variances as opposed to the factor analysis (FA) which only explores an item and suggests a factor for each of the items. According to Joreskog and Sorbom (1993), the evaluation of the measurement model is done by assessing the quality of the items for each construct individually (or known as the con-generic model) and followed by retesting the constructs simultaneously, which is known as confirmatory factor analysis (CFA). Using Bentler's (1995) suggestion, an appropriate number of samples (N=171>150) gives reasonable weightage to use CFA in order to establish a confirmatory test.

The measurement models for each fear of crime construct which is a crime problem in a neighbourhood, crime-specific and environmental factors were developed as shown in Figure 1.

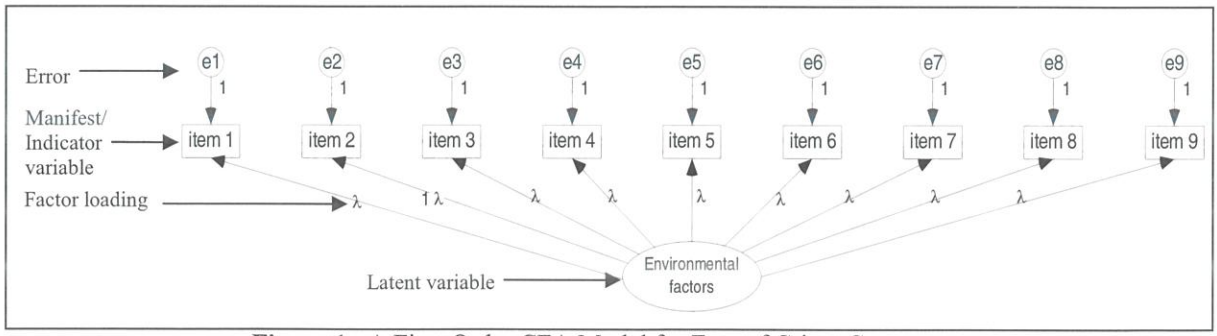

Figure 1: A First-Order CFA Model for Fear of Crime Construct

Figure 1 demonstrates the measurement model which comprised one latent variable (environmental factor) which is measured by nine items (Item 1 to Item 9) and each item has its own measurement error. Every dimension of fear of crime will undergo the first order CFA model. The quality of each item that develops this construct is determined by the factor loading as symbolized by λ. Factor loading imparts information about the total number of variances contributed by each item

towards the measure construct and the factor loading value of 0.30 (Sellin & Keeves, 1997) was used as a cut-off value to determine the suitability of the item in measuring the latent variable. Apart from the factor loading value, several indices were employed to judge whether the model tested fits the data, such as Chi-square, Chi-square/degree of freedom ratio, and goodness of fit indices. AMOS provides a variety of fit indices and this study employs the goodness of fit indices as suggested by Hair, Black, Babin and Anderson (2006) such as Root Mean Square of Approximation (RMSEA), Goodness of Fit Index (GFI), Normed Fit Index (NFI), Comparative Fit Index (CFI) and Tucker-Lewis Index (TLI). According to Hair *et al.* (2006), the value of GFI, NFI, CFI and TLI of 0.9 and above show a well fitted model. As for RMSEA, a value of between 0.03 and 0.08 is considered to be good.

The results of the confirmatory factor analysis (CFA) in the first-order illustrated that the two models have achieved a good fit between the models and the data, which are the measurement models for crime problems in neighbourhoods (CPN) and environmental factors (EF). The Chi-square value (X^2) for the CPN measurement model is not significant ($X^2(2)=1.924$, $p>0.05$) and shows good fit between model and data. The values for the fit indices of GFI, CFI and TLI on the other hand exceeded 0.90 and the RMSEA value was less than 0.05. It was a similar finding for the EF model, where the Chi-square (X^2) value was also not significant ($X^2(2)=9.909$, $p>0.05$), the goodness of fit indices of GFI, CFI and TLI also recorded values above 0.90 and the RMSEA value was less than 0.05. The values further strengthen the fit of this measurement model against the data (Schreiber, Stage, King, Nora, & Barlow, 2006). Meanwhile for the crime-specific construct (CS), the measurement model found that Chi-square value (X^2) was significant ($X^2(1)=5.946$, $p<0.05$), but the values for the fit indices of GFI, CFI and TLI recorded values exceeding 0.90 and the RMSEA value was 0.17. This is the best fit measurement model for CS construct based on the data. Several items were eliminated as they possess a factor loading value of less than 0.03 (Sellin & Keeves, 1997).

On the other hand, the level of reliability was determined through the internal consistency for each factor that was determined by calculating the Cronbach's Alpha value as shown in Table 1.

Table 1: Results of Fear of Crime Measurement Model Variables

Fear of Crime dimension	Items	Description of Items	Factor Loading	Reliability
Crime Problems in Neighbourhood (CPN)	Item 1	House breaking or theft incidences	-	0.88
	Item 2	Vehicle theft (automobile, motorcycle, van, bicycle, lorry)	0.74	
	Item 3	Vandalism such as breaking windows, public property thrashing	0.77	
	Item 4	Drug dealing problems	0.87	
	Item 5	Physical assault on individuals such as battery or assault	0.87	
Crime-specific (CS)	Item 1	House breaking	-	0.93
	Item 2	Physical assault	0.90	
	Item 3	Vehicle theft	0.70	
	Item 4	Sexual harassment	0.96	
	Item 5	Rape	0.97	
Environmental factors (EF)	Item 1	I am fearful when I come across acts of vandalism	-	0.95
	Item 2	I am fearful when I walk near overgrown areas or thick undergrowth	0.86	
	Item 3	I am fearful when I walk near abandoned housing schemes	0.94	
	Item 4	I am fearful when I come across loiterers		
	Item 5	I am fearful when I come across drunkards	0.84	
	Item 6	I am fearful when I come across homeless people	0.95	
	Item 7	I am fearful when I hear news of crime in the media	0.92	
	Item 8	I am fearful when I hear accounts or experiences of being crime victims from friends or neighbours	-	
	Item 9	I always relive visuals of crime after reading news of acts of crime	-	
			0.78	

qNote: (-) = Items eliminated through the measurement model process

Table 1 reports that the crime problems in neighbourhoods (CPN) dimension has an alpha value of 0.88, the crime-specific (CS) dimension has a value of 0.93 and the environmental factors (EF) dimension has an alpha value of 0.95. This shows that all three dimensions have a good reliability value as the Cronbach's Alpha value exceeds 0.7 (Hair, Black, Babin, & Anderson, 2006). The findings from the first-order measurement model for every latent variable for fear of crime construct were used in the second-order model. In this second-order model, fear of crime (FOC) acts as a latent variable measured by the three dimensions as the first order factor which became the observed variables for FOC.

The CFA was then employed in this study to examine whether the extracted factor structure that had been defined by a hypothesis model fitted the data adequately. The goodness of fit indices (GOF) such as GFI, CFI and TLI of at least 0.9 and above and a RMSEA value of less than 0.06 (Schreiber, Stage, King, Nora, & Barlow, 2006) were used to ensure fitness of data. The hypotheses second-order model is shown in Figure 2.

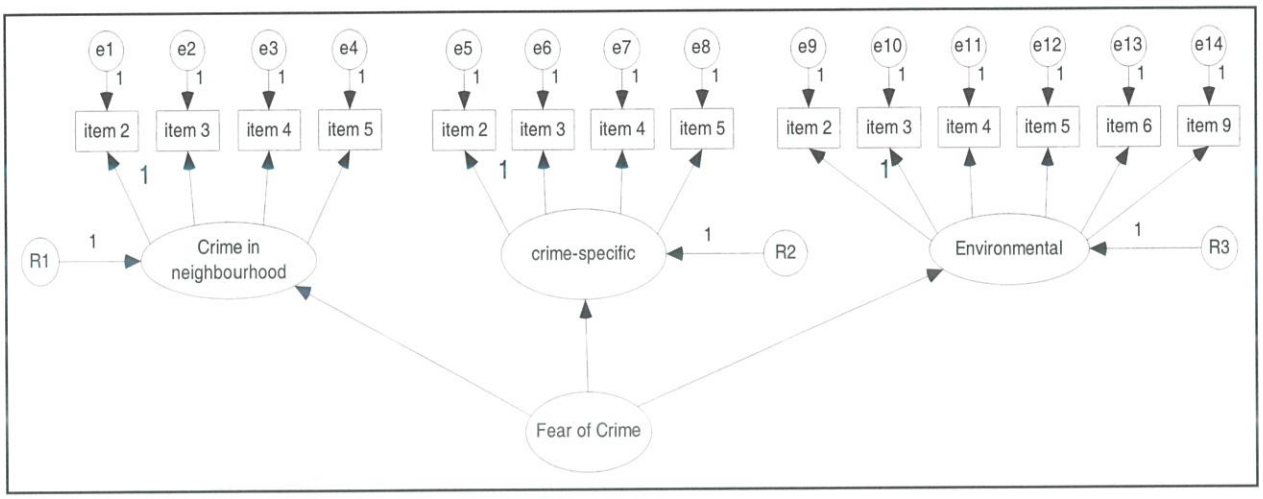

Figure 2: A Priori Hypotheses Second-Order Model

The final result of the Confirmatory Factor Analysis (CFA) is shown in Figure 3, and GOF indicates that the Chi-square (X^2) value is significant ($X^2(60)=142.216$, $p<0.05$), and Chi-square/df=2.370.

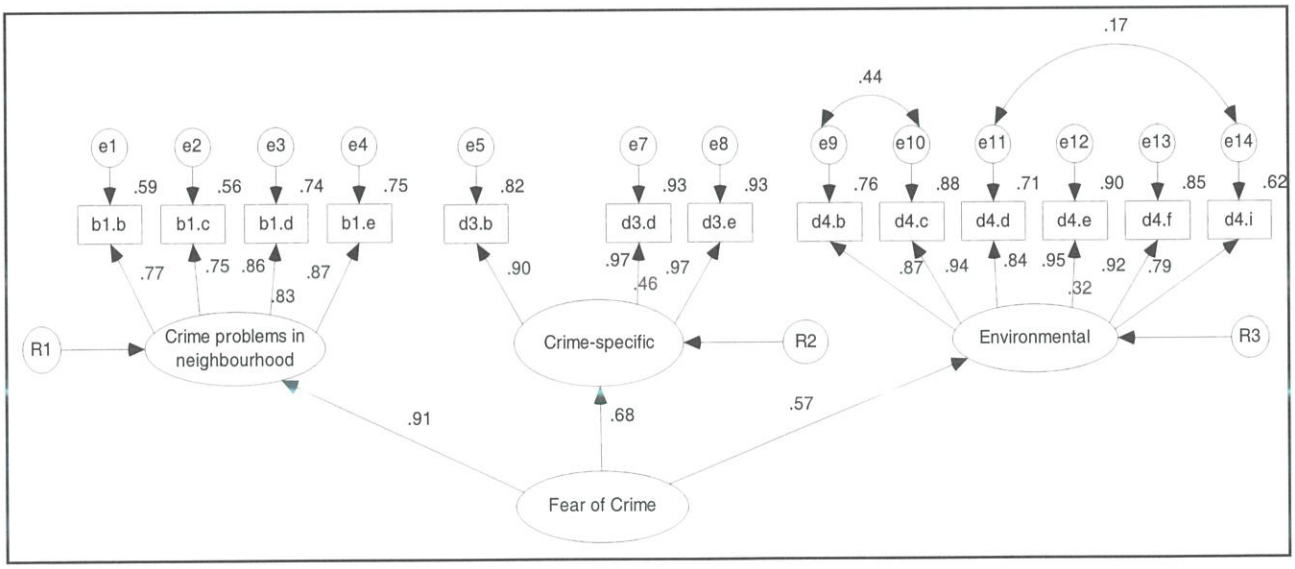

Figure 3: A Second-Order CFA Fear of Crime Model

In the model fits, the findings further show that RMSEA=0.09, CFI=0.96, TLI=0.95, and GFI= 0.89 indicating that this is the best model fitted based on the data collected. The second-order model indicates that the crime problems in neighbourhoods (CPN) variable was best measured by four indicators namely Item 2 (b1.b), 3 (b1.c), 4 (b1.d) and Item 5 (b1.e); crime-specific (CS) was extracted by 3 items namely Items 2 (d3.b), 4(d3.d), and 5 (d3.e); while the environmental factors (EF) variable was measured by six indicators namely Items 2 (d4.b), 3 (d4.c), 4 (d4.d), 5 (d4.e), 6 (d4.f) and 9 (d4.i). Fear of crime (FOC) was found to be best measured by three dimensions namely CPN, CS and EF. In Figure 3, the double-headed arrow is used to imply covariance between two measurement variables which was based on the modification indices, and the level of covariance between two errors namely *e9* and *e10* also *e11* and *e14* were discovered to be high. It implies that Item 2 (d4.b) error in the EF variable

was highly correlated with that associated with the measurement error of Item 3 (d4.c), and Item 4 (d4.d) error was highly correlated with that associated with the measurement error of Item 9(d4.i) in the same variable. Based on the Standardized coefficients between latent variables and the FOC construct, it was revealed that the CPN (r= 0.91) dimension represented FOC better than the other two dimensions (CS; r=0.68, EF; r=0.57).

CONCLUSIONS

The objective of this paper is to validate the fear of crime construct by using the Confirmatory Factor Analysis test with the series of measurement model. Based on findings of past research the fear of crime construct was measured using crime-specific (British Crime Survey, 2005; Renauer, 2007), environmental factors (Ferguson & Mindel, 2007; Franklin & Franklin, 2009; Nasar & Fisher, 1993) and problems in neighbourhoods (Gibson, Zhao, Lovrich, & Gaffney, 2002) constructs whilst demonstrating that these dimensions yield a high internal reliability level. However, the said measurement was based on exploratory factor analysis (EFA) that was conducted without knowing how many factors really exist or which variables belong to which construct. Thus, instead of allowing the statistical method to determine the number of factors and loadings as in EFA, CFA statistics are also able to determine how well theoretical fear of crime matches reality (the actual data). This means that CFA can "confirm" or 'reject" the preconceived theory. Based on the above, the findings of this paper indicate that the three FOC dimensions namely CPN, CS and EF may be validated as the dimension that could measure fear of crime whereby the CPN dimension is the best dimension to measure fear of crime in neighbourhoods.

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