한국심리학회지 : 사회문제
Korean Journal of Psychological and Social Issues
2005, Vol. 11, No. 2, 47～71.

Factor Structure of the Buss-Perry Aggression Questionnaire for a Korean Offender Population

Soo Jung Lee

Criminological Psychology, Graduate School, Kyonggi University

The unexpected increase of violent crimes in Korea urges people to look for more dynamic explanations of criminal behavior other than sociological eugenics such as a struggle between social classes or assimilation to deviant social environment. In this study, criminal behavior is treated as personal matter according to the tradition of psychological theories of crime rather than sociological phenomenon. Furthermore, aggression is supposed to be one of the most basic dispositional characteristics of violent acts. Therefore, this study explored the relationship between aggression measured by BPAQ and criminality evaluated based on seriousness of criminal offenses. On the other hand, the cross-validity of BPAQ was also investigated since prevalence and expressive forms of violence is known to vary across cultures and even within a society. The variance analyses and causal modeling presented that BPAQ had satisfactory level of cross-validity and dispositional aggression measured by BPAQ might have causal effect on criminality of Korean offenders. Additionally, a theoretical internal structure of BPAQ had been confirmed to be reasonable by confirmatory factor analyses.

key words : BPAQ, aggression, offenders

---

* This research was supported by the Korea Research Foundation Grant (KRF-2004-074-HS0009).

† Corresponding Author : Soo Jung Lee Ph.D., (442-760) San 94-6 Yiui-Dong, Paldal-Gu, Suwon-Si, Kyunggi-Do, E-mail : suejung@hanmail.net

There has been a significant increase in the number of crimes during the past 30 years in Korea. This crime increase rate in Korea is significantly higher than other countries. For example, the crime rate has been 1% increased (from 11,635,149 to 11,605,751) in the United States and 9% decreased (from 6,903,816 to 6,254,723) in Germany both between 1999 and 2000, while Korea had 9% increase (from 1,104,946 to 1,230,467) during same time period in crime (Supreme Public Prosecutors' office of Republic of Korea, 2003).

Specifically, in Korea the reported number of violent crimes including criminal homicide, assault, robbery, rape, arson, and other sexual offenses sharply increased. Among these violent crimes the highest increase rate was reported in cases of criminal homicide (10.4%) and rape (10.2%) (Supreme Public Prosecutors' Office of Republic of Korea, 2003).

The unexpected increase of violent crimes in spite of the radical improvement of living conditions requires a dynamic explanation of criminal behavior other than sociological eugenics such as a struggle for status change of the poor (e.g., Dahrendorf, 1995; Lynch & Groves, 1986; and Bohm, 1982) or assimilation to social environment (e.g., Akers, 1985; Bandura, 1983). In this study criminal behavior is treated as personal matter according to the tradition of psychological theories (Eysenck, 1977) of crime rather than sociological phenomenon. Furthermore aggression is supposed to be one of the most basic dispositional characteristics of violent acts (e.g., Baron, 1983).

The prevalence and expressive forms of violence vary considerably across cultures. Across and within societies, cultural differences play an important role in violence and aggression. Many psychologists have studied cultural differences among Caucasian men, which might be related to the tendency to behave violently (e.g., Nisbett, 1993). However, unfortunately, there are few studies on violence among the Asian population. This study is one of the few attempts to investigate aggression and its relation to violent crimes in an Asian population.

Traditionally, as one of the basic ingredients in violent crimes, aggression has been studied by numerous scholars (Baron, 1983; Bartol, 1999; Kahn, 1984; Williams, Boyd, Cascardi, & Poythress, 1996). Aggression is often defined as any action that is accompanied by an intention to cause harm to another (Berkowitz, 1973). Among a variety of etiological viewpoints of crime, aggression has been consistently put forward as one of the most important individual factors. However, there are many different theories to explain the relationship between aggression and violent crimes.

One of the most frequently cited theories to explain aggression and violence is the

frustration and aggression hypothesis (Dollard, Doob, Miller, Mowrer, & Sears, 1939). This theory is derived from psychoanalytic theory and regards aggressive impulse as an integral part of human nature. Frustrated, thwarted, annoyed, or threatened people have long been regarded as being prone to aggressive behavior. This viewpoint that frustration causes aggression is the one of the oldest empirically proven psychological hypotheses (Bushman, Baumeister, & Phillips, 2001).

Berkowitz (1973) had expanded on this theory and described the links between frustration and aggression in more detail. He argued that blocking an individual from obtaining an expected goal might produce frustration. This frustration then generates aversive feelings such as anger, and anger produces action readiness to aggressive behavior. Then whether the final consequences become present or not depends on the accessibility to aggression-eliciting stimuli such as the presence of firearms. More recently Berkowitz (1989) proposed that all states of negative affect, not just being frustrated, deserved to be recognized as causes of aggression. For example, when slapped in the face people automatically judge the environment to be hostile or threatening, get angry or scared, and prepare for the fight or flight response (e.g., Berkowitz, 1993). His premise of negative affect-aggression link has been pervasively supported by many studies (Leith & Baumeister, 1996; Petersen, Gonzales, & Miller, 2000; Twenge, Baumeister, Tice, & Stucke, 2001).

Other theorists focused on cognitive factors in the pathway to arrive at the final results, violent behaviors. Social learning theory (Bandura, 1983), cognitive scripts model (Huesmann, 1988), and the hostile attribution model (Dodge, 1986) might be good examples that seek to explain the mental processes and pathways between aggression and its violent results. Unlike emotion theorists including Berkowitz emphasizing the automatic natureof aggressive pathways, a social information processing theorist, Dodge (1980, 1986, 1991) agreed to the perspective that aggression must be more intentional (Rule & Duker, 1973), foreseeable (Dyck & Rule, 1978), and freely chosen (Costanzo, Grumet, & Brehm, 1974) rather than accidental, unforeseeable, and constrained. With defining aggression into two different types of responses, proactive and reactive aggression, he and his colleagues (Crick & Dodge, 1996; Dodge, Price, Bachorowski, & Newman, 1990) found reactive aggression was significantly explained by hostile attributional biases. Aggressive children and adolescents attributed even ambiguous provocation of peers to hostile intents (Dodge, 1980; Steinberg & Dodge, 1983).

Criminological studies (e.g., Gelles & Cornell, 1990; Fritzon & Garbutt, 2001)

analyzing real crimes, yet, reported at most 10% of aggressive crimes such as family violence could be explained by offenders' characteristics. Even a psychologist (Dodge, 1986) said the relation between cognitive skills and antisocial behavior was empirically significant but weak in magnitude. Yet, theorists like Moffitt (1993) who focused on the idiographic characteristics within an individual emphasized strongly the life-course persistence of criminogenic needs. Among criminogenic needs, trait-like aggressive patterns of cognition and behavior were again paid attention by many scholars (Loeber & Dishin, 1983; Loeber & Hay, 1997; Loeber, Kalb, & Huizinga, 2001; Loeber, Stouthamer-Loeber, Van Kammen, & Farrington, 1991; Olweus, 1981; Parke & Slaby, 1983).

The Aggression Questionnaire (Buss & Perry, 1992) is currently one of the most frequently used instruments to assess individual aggressive tendencies. Many studies have defined aggression as a combination of sub-traits, and numerous attempts also have been made to develop tools to measure these sub-traits (Buss, 1961, 1971; Buss & Durkee, 1957; Buss & Perry, 1992; Harris, 1995; Huss, Leak, & Davis, 1993; Zillmann, 1979). Among the inventories measuring aggression, the Aggression Questionnaire (AQ; Buss & Perry, 1992) which revised the Buss and Durkee's Hostility Inventory (Buss & Durkee's 1957) is gaining in use since its development in 1992.

The original AQ (Buss & Durkee's 1957) consisted of 6 dimensions of aggression, including physical aggression, verbal aggression, anger, indirect aggression, resentment, and suspicion. However, 4 factors (physical aggression (PA); verbal aggression (VA); anger (ANG); and hostility (HO)) were identified through exploratory factor analysis using principal axis factoring and oblimin rotation. Buss and Perry found that this 4-factor model with 29 items was supported by confirmatory factor analysis using a sample of 448 college students. Among these sub-traits the former two factors (PA and VA) could be considered behavioral outputs and the latter two factors (ANG and HO) might represent the emotional and cognitive contributors (Williams, Boyd, Cascardi, & Poythress, 1996).

Several empirical studies have investigated the factor structure of the AQ and all have reported that the original theoretical model did not adequately fit the data using confirmatory factor analytic methods and standard indices of fit. These studies consistently reported that some items or subscales might be redundant and proposed a simpler structure based on their empirical analyses.

A cross-cultural validation study on a Canadian university student sample (Harris, 1995) generally supported the 4-factor structure that Buss and Perry (1992) found. However, the study also concluded that the hostility

scale could be improved psychometrically if the 2 suspicion items were eliminated from the scale.

Meesters, Muris, Bosma, Schouten, and Beuving (1996) attempted to apply the AQ outside of the North America. They replicated Buss and Perry's (1992) and Harris' (1995) findings on a Dutch university student sample. Also they recommended removing 3 items from the questionnaire (1 VA item and 2 HO items) that had multi-collinearity problems.

The first AQ validation study on an Asian sample was conducted in Japan by Nagano (2001). He measured the psychometric properties of the AQ translated into Japanese and replicated the 4-factor model of the original AQ. The result of this study showed that the 4-factor model of the AQ was generally supported in the Japanese sample. However, he found that 2 reverse scored items (1 from the PA scale and 1 from the ANG scale, had inadequate factor loadings. The problem of these two items was even more remarkable for Japanese individuals than for US individuals (Iwata, Roberts, & Kawakami, 1995). Researchers consistently concluded that the AQ might be improved if the two reversed scored items were eliminated from the scale for the cross-cultural validation.

More recently, Bryant and Smith (2001) made an attempt to shorten each subscale by omitting several items with low loadings, multiple loadings and reverse-scored wordings. However, they tried to maintain the conceptual scheme of aggression proposed in the original AQ. They found a reduced model with 3 items per scale to fit the data adequately using several different college student samples. (Either include a table with the new set of items or put them into a footnote.)

The most recent study to test the validity of a factor structure of the AQ was done using an offender sample (Diamond, Wang, & Buffington-Vollum, in press). They tested Bryant and Smith's parsimonious model as well as several others with a sample of 786 mentally ill male prisoners. The Bryant and Smith 12 item factor model that had three items for each subscale fit their offender data well. However, they found that one of the items in the ANG subscale had an unacceptably small factor loading and resulted in a scale with low reliability as measured by Cronbach's alpha. Therefore the item, I flare up quickly but get over it quickly was dropped and another item from the original Anger scale I sometimes feel like a powder keg ready to explode was substituted. The model with this substituted item fit the data well and the reliability and factor loadings were all in the acceptable range.

The current study investigated the adequacy of the original and reduced models of Korean translation of the Buss-Perry AQ with a

sample of Korean offenders. Confirmatory factor analysis was used to assess the competing models and construct validity was further investigated by considering the correlations between offender's scores on the scales of the instrument and indicators of aggressive behavior such as participation in violent crime, number of arrests, and crime seriousness. Reliabilities and factor loadings was also assessed for the scales resulting from the competing models. Since Korean offenders generally have less education and lower reading abilities than non-offenders, and offenders in general might be said to have shorter attention spans than non offenders (Lexcen, & Redding, 2000), there are potential advantages to the shorter scale should it prove to be adequate with this group.

After a parsimonious, adequately fitting model was determined, we also investigated some of the structural relationships postulated among the constructs of anger, hostility, physical and verbal aggression and criminal behavior. Among subscales of the AQ, PA and VA might be viewed as different types of aggressive results, whereas HO and ANG could be considered contributing factors. Therefore the causal relationship among aggression factors was also assessed in this study. Among four factors of the AQ, ANG and HO could be regarded as remote factors to mediate provoking environment and aggressive behavioral patterns, VA and PA.

Furthermore, the effect of verbal aggression escalating physical aggression was assumed. During the earlier stages of aggression, an aversive event produces a negative affect almost automatically. However, mediating cognitive elaboration process becomes more important in later information processing stages of aggression. Being verbally insulted is a good example to make clearer appraisal of anger and then give rise to a variety of aggressive behavioral responses for retaliation. Therefore, among four factors of AQ, VA could be prone to facilitate both of these two processes eventually followed by PA.

Researchers (Pomara, Volavka, Czobor, & Sidtis, 2002) also found that there was a significant relationship between VA and PA. By use of the hierarchical linear modeling they revealed a complex relationship between screaming and physical aggression (hitting and grabbing) among patients with dementia. The result showed that PA became maximal when VA (e.g., screaming) was absent. However, when VA was present, PA increased as VA was escalated. These research results proposed there might be significant causal scheme among AQ factors and criminal conducts among offenders, target population in this study. Therefore, causal relationship was additionally investigated by structural equation modeling besides the confirmatory factor

analysis of a four-factor structure. The main hypothesis of causal modeling was that ANG and HO might be the remote factors and aggressive behavioral patterns, VA and PA must moderate to produce offenders' violent criminal conducts. Specifically VA might provide an escalating effect on PA. Competitive models to maintain this basic relationship were compared.

Method

Participants

Participants in this study were 268 Korean offenders; 109 were from maximum security correctional facilities and 159 were on probation in the community. Among these participants 255 male and 12 female offenders were included. All female participants were probationers. Participants were randomly chosen from the list of offenders of each facility and were recruited to participate on a voluntary basis. These data were collected from the 24th of December, 2002 to 28th of December, 2002 from maximum security prisons in 5 cities. Data from probationers were collected between the 3rd of January, 2003 and the 29th of January, 2003 at the S city probation office in Korea. This data collection procedure was conducted under the permission of the internal board of human rights of each facility.

Basic demographic data such as age, gender, marital status, educational level, types of crime, prior arrest history, age of first crime and violent crime history is provided in Table 1. Demographic variables for 268 participants were provided based on the data-base of Korean Inmate Classification System; participants' age ranged from 16 to 64 and the mean age was 34.3 (SD=11.06). The sample included 125 singles (46.6%), 91 married (34.0%), 33 divorced (12.3%), 8 separated (3.0%), and 1 widowed (0.4%). There were 5 missing cases (1.9%).

For the educational level, 68 offenders (25.4 %) had junior high school or less educational experiences, and 51 participants (19.0%) had at least college or university experience. Among others, 58 of them (21.6%) had less than high school diploma, and 82 had completed high school level (30.6%).

Primary charges of participants varied, and included arson, assault, murder (including attempted murder), burglary, drug, DWI, embezzlement, fraud, larceny, rape, robbery, and so on. For analysis the crime types were re-categorized into 3 groups; aggressive crime, property crime, and others. The aggressive crime category included murder (including attempted murder), rape, robbery, arson, and assault. There were 59 cases in this category. Forgery, fraud, larceny, embezzlement and

Table 1. Demographic characteristics

		Prisoner Sample (N=109)		Probationer Sample (N=159)	
		N	%	N	%
Age					
	Mean	36.4		32.9	
	Range	18-64		16-61	
Educational Level					
	Less than elementary school	16	15.5	12	7.6
	Less than highschool	65	63.2	115	72.9
	College or higher	20	19.4	31	19.6
	None of above	2	1.9		
Criminal History					
	Yes	63	0.59	58	0.37
	No	44	0.41	100	0.63
Number of Criminal History					
	0	37	0.37	90	0.6
	1~2	22	0.22	35	0.24
	3 times or more	41	0.41	24	0.16
Violent Crime History					
	Yes	29	27.9	38	24.2
	No	75	72.1	119	75.8
Age of First Crime					
	19 or young	35	33.0	45	29.8
	19~25	31	29.2	29	19.2
	26~30	12	11.3	25	16.6
	31~35	7	6.6	22	14.6
	36~40	6	5.7	14	9.3
	41 or older	13	12.3	16	10.6
Types of Crime					
	Aggressive crime	21	21.4	32	31.1
	Property crime	45	45.9	11	10.7
	Others	32	32.7	60	58.3

perjury were categorized as a property crime, and military law violation, DWI, and traffic related offenses were included into other category.

Thirty-seven prisoners and 90 probationers did not have any prior criminal histories, while 57 offenders (22 prisoners and 35 probationers) have 1 or 2 times and 65 offenders (41 prisoners and 24 probationers) have 3 times more. The greatest number of prior criminal history was 21 times. Eighty offenders answered they committed their first crime when they were 19-year-old or younger. Those who had the violent crime history were 67 offenders, while 194 offenders did not have any violent criminal histories.

Measure

The Korean version of the AQ was employed using the same 29 items and response format (5-point Likert format) from one (extremely uncharacteristic of me) to five (extremely characteristic of me) as the original Buss and Perry version. Four subscales of the questionnaire, established on the basis of factor analyses, were Physical Aggression (PA: nine items), Verbal Aggression (VA: five items), Anger (ANG: seven items), and Hostility (HO: eight items). The Korean version of the AQ was translated from English to Korean by two bilinguals and independently translated back to English again. This back translating procedure demonstrated that the translated Korean version items closely same as the meaning of the original English version of Buss and Perry.

Procedure

The research proposal was first reviewed at the internal board of each facility not to invade human subject issues. Then permission was obtained to recruit offenders to participate in this study. All offenders were randomly chosen from the list of names at each facility. Then offenders were asked to cooperate with data-collection on a voluntary basis. The purpose of the study was described as one while world to investigate psychological characteristics and all participants were advised they could discontinue participation and leave at any time should they feel uncomfortable with the questionnaire. All participants independently performed every step of procedure. Informed consent was granted at the time of the testing and offenders were assured that all identifying information would be stripped from the data prior to analysis or reporting and reports would only be provided at the aggregate level.

Data Analysis

Rather than searching for a new conceptual model based on the factor structure to be

obtained in this sample, reduced models of Bryant and Smith's and Diamond et al's were compared, which kept the Buss and Perry's original theoretical model. This is to lessen the reading load of the AQ for offenders. The confirmatory factor analyses were performed using AMOS 4.0 to compare these more parsimonious models with the original Buss and Perry model.

In addition to the Chi-Square, which is quite sensitive to sample size, four other indices of model fit were used to assess the adequacy of each hypothesized model (Browne and Cudeck, 1993). Two incremental fit indices that tend to complement one another and which are relatively unrelated to sample size (the NNFI and the CFI) were chosen as recommended by Marsh, Balla and Hau (1996). The GFI which has been shown to perform well when compared to other absolute fit indices was chosen to reflect that class in fit index (Hu & Bentler, 1995). For the previous three indices, values of .90 and above are considered adequate (Bentler & Bonnett, 1990). Finally, the RMSEA, which assesses the magnitude of the residuals when the actual covariance matrix is compared to the covariance matrix implied by the model, was used. Values up to .08 on this index are considered adequate (Browne & Cudeck, 1993).

In order to investigate a causal relationship among aggression factors and criminal offences causal modeling was then applied. For this analysis number of times the individual had been arrested prior to this incarceration was recoded to recover the normality of the distribution based on the frequency analysis. This variable was categorized into 3 categories; none, 1 or 2 times, and 3 times or more. Also the type of instant crime was recoded into three categories; misdemeanor, nonviolent property crime vs. violent crime. These two variables were set as measurement variables to define the latent variable, "so-called" CRIMINALITY, which was an ultimate effect variable. Criminality was produced by two measurement variables, number of criminal history and the violence of current conviction.

Structural equation modeling was then used to assess the relationship between the four factors of aggression (VA, PA, HO, & ANG) as measured by the reduced AQ and criminal behavior (CRIMINALITY). The primary hypothesis that was tested was that VA and PA served as mediator variables between ANG and HO and CRIMINALITY. In order to investigate the relative plausibility of this hypothesis several competing models were postulated and tested. Model 1 was first tested as the most basic model in which only direct effects of AQ factors on CRIMINALITY (Figure 1) were permitted. Model 2, in contrast, was the most complicated model and allowed all possible direct and indirect effects

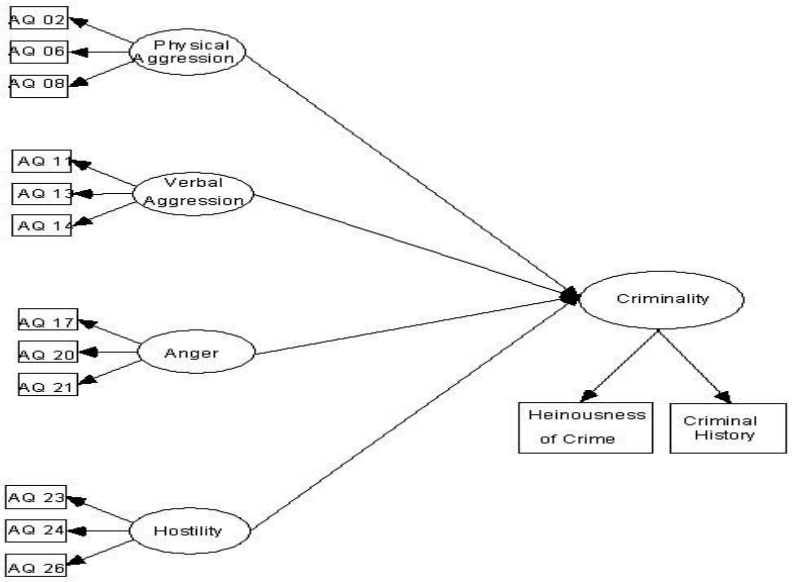

Figure 1 A Theoretical Model of Causal Model

among variables (Figure 2).

According to researchers (Berkowitz, 1989; Pomara et al, 2002; Williams et al, 1996), some factors such as anger and hostility might ignite tendency to act aggressively and then eventually concrete aggressive behaviors would be produced. Therefore, it could be expected that there might be a causal relationship even among aggression factors and then eventually to offenders' criminal acts.

Model 2 was further refined by removing insignificant paths and adding parameters based upon an inspection of modification indices and consideration for theoretical clarity. Models 3 through 6 shown in Table 7 reflect this process of refinement.

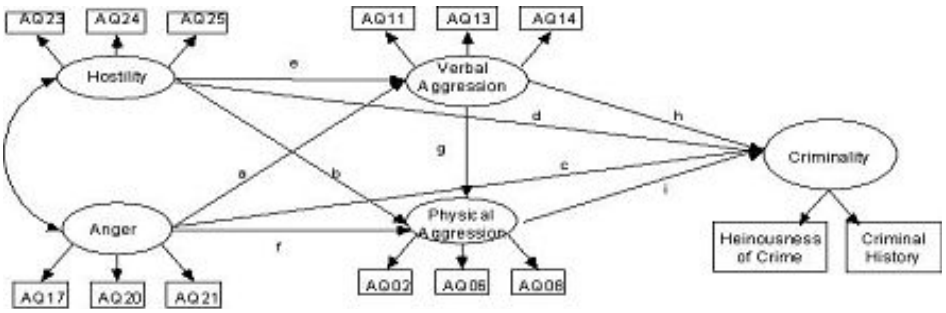

Figure 2 A Theoretical Model of Causal Model

Result

One of the major research purposes was to identify the most parsimonious but still reasonable factor structure for the AQ that would fit the data from current Korean offender sample. In order to achieve this goal, three factor models were tested: the original

Table 2. Items Constituting the Original and Refined Measurement Models of the AQ

Factors	Items	Mean(SD)
Physical Aggression	1. Once in a while I can't control the urge to hit another person.	1.81(1.11)
	2. Given enough provocation, I may hit another person.	2.47(1.22)
	3. If somebody hits me, I hit back.	3.07(1.25)
	4. I get into fights a little more than the average person.	1.94(1.11)
	5. If I have to resort to violence to protect my rights, I will.	2.57(1.28)
	6. There are people who pushed me so far that we came to blows.	2.40(1.23)
	7. I can think of no good reason for ever hitting a person*	3.68(1.26)
	8. I have threatened people I know.	1.92(1.15)
	9. I have become so mad that I have broken things.	2.62(1.31)
Verbal Aggression	10. I tell my friends openly when I disagree with them.	3.24(1.20)
	11. I often find myself disagreeing with people.	2.23(1.04)
	12. When people annoy me, I may tell them what I think of them.	3.12(1.18)
	13. I can't help getting into arguments when people disagree with me.	2.54(1.13)
	14. My friends say that I'm somewhat argumentative.	2.00(1.05)
Anger	**15. I flare up quickly but get over it quickly.**	2.99(1.22)
	16. When frustrated, I let my irritation show.	2.25(1.10)
	17. I sometimes feel like a powder key ready to explode.	2.37(1.15)
	18. I am an even-tempered person.*	2.73(1.07)
	19. Some of my friends think I'm a hothead.	2.82(1.19)
	20. Sometimes I fly off the handle for no good reason.	2.15(1.14)
	21. I have trouble controlling my temper.	2.15(1.14)
Hostility	22. I am sometimes eaten up with jealousy.	2.34(1.14)
	23. At times I feel I have gotten a raw deal out of life.	2.56(1.11)
	24. Other people always seem to get the breaks.	2.56(1.07)
	25. I wonder why sometimes I feel so bitter about things.	2.06(1.02)
	26. I know that "friends" talk about me behind my back.	1.99(.96)
	27. I am suspicious of overly friendly strangers.	2.82(1.09)
	28. I sometimes feel that people are laughing at me behind my back.	2.20(1.02)
	29. When people are especially nice, I wonder what they want.	2.67(1.12)

Buss and Perry (1992)'s four factor model, the Bryant & Smith (2001) reduced four factor model, and the Diamond, Wang, and Buffington-Vollum (in press) revision of the Bryant & Smith model. Table 2 presents the means and standard deviations of all 29 items of the original AQ.

Confirmatory Factor Analysis

Confirmatory Factor Analyses were used to assess the fit of the three proposed models for the AQ with this Korean inmate sample. The goodness-of-fit indices were evaluated for the three alternative measurement models; the original Buss and Perry's model, Bryant and Smith's parsimonious model, and Diamond et al's revised parsimonious model. Table 3 summarizes the results of these analyses.

First, the Buss and Perry's four factor model did not reach the acceptable level of fit with current Korean offender sample. There was too much common variance that was unexplained as indicated by both the absolute (GFI = .71) and relative fit indices (NNFI = .65). This original four factor model also had a relatively high ratio of chi-square to degrees of freedom (X^2/df = 3.28) and an unacceptably large, root-mean-square ofapproximation (RMSEA = .092). This finding is consistent with findings of previous researchers (e.g., Archer, Kilpatrick, & Bramwell, 1995; Bryant & Smith, 2001; Diamond et al, in press; Harris, 1995; and Williams et al, 1996) who have reported the inadequacy of the twenty nine item factor models of the original AQ scale.

Both revised models with reduced number of items resulted in acceptable fit. Both the Bryant and Smith's and the Diamond et al model fit the data better than the Buss and Perry's original 29 item four factor model. These reduced factor structures achieved sufficient goodness-of-fit both absolute (GFIs = .92 - .93) and relative (fit indices = .87 -

Table 3. Goodness-of-Fit Statistics for Three CFA Models

	# items	X2	df	X^2/ df	GFI	RMSEA (90% CI)	CFI	NNFI
Buss & Perry's model	29	1216.95	371	3.28	0.71	0.092 (.087-.098)	0.72	0.65
Bryant & Smith's model	12 (item 15)	135.76	48	2.83	0.92	0.083 (.067-.099)	0.91	0.87
Diamond et al's model	12 (item 17)	114.09	48	2.38	0.93	0.072 (.055-.089)	0.94	0.90

Table 4. Scale Inter-correlations and Reliabilities of Subscales (N=268)

	B/S_PA	B/S_VA	B/S_ANG	B/S_HO	D_PA	D_VA	D_ANG	D_HO
B/S_PA	0.66							
B/S_VA	.56***	0.66						
B/S_ANG	.61***	.59***	0.58					
B/S_HO	.39***	.46***	.54***	0.72				
D_PA					0.66			
D_VA					.56***	0.66		
D_ANG					.58***	.54***	0.8	
D_HO					.39***	.46***	.50***	0.72

* $p<.05$, ** $p<.01$, *** $p<.001$

B/S indicates Bryant and Smith (2001)'s model and D indicates Diamond et al (2003)'s model

.90) terms. Furthermore, the chi-square to degree of freedom ratios for these models (X^2/dfs = 2.832.38) and RMSEAs showed improvement (RMSEAs = .083 - .072). Based on these indices, Diamond et al's model could be concluded to have slightly better fitness to this offender group.

Table 4 presents reliabilities and inter-correlations of subscales of the two parsimonious models. The only difference between two parsimonious models was which items were included into the subscale of anger. Coefficient alpha indicated that inclusion of item 17 of Table 2 instead of item 15 improved the reliability of anger subscale from .58 to .80, as Diamond et al (2003) suggested. When compared to the reliabilities of original Buss & Perry (1992)'s subscales these indices were not low in spite of the decreased number of items; .77 in physical aggression, .66 in verbal aggression, .77 in anger, .80 in hostility.

Prior to conducting further analyses looking at the relationship between the AQ and CRIMINALITY, a decision had to be made about which of the models best reflected the constructs of interest. Table 5 presentsthe factor loadings for the two parsimonious models that were shown to have adequate fit. As expected from the analysis of reliabilities, the Diamond et al model which substituted item 17 for item 15 in the ANG scale appeared to be superior with this sample. All items had factor loadings higher than .50 and the reliabilities were adequate, therefore it was decided that this model would provide the basis for subsequent analyses.

Table 5. Factor Loadings for Bryant & Smith's model and Diamond et al's model

		Bryant & Smith's model	Diamond et al's model
Physical Aggression	2. Given enough provocation, I may hit another person.	0.53	0.53
	6. There are people who pushed me so far that we came to blows.	0.68	0.67
	8. I have threatened people I know.	0.67	0.68
Verbal Aggression	11. I often find myself disagreeing with people.	0.65	0.66
	13. I can't help getting into arguments when people disagree with me.	0.52	0.51
	14. My friends say that I'm somewhat argumentative.	0.72	0.71
Anger	15. I flare up quickly but get over it quickly.	0.22	-
	17. I sometimes feel like a powder key ready to explode.	-	0.7
	20. Sometimes I fly off the handle for no good reason.	0.84	0.82
	21. I have trouble controlling my temper.	0.8	0.77
Hostility	23. At times I feel I have gotten a raw deal out of life.	0.66	0.66
	24. Other people always seem to get the breaks.	0.65	0.65
	25. I wonder why sometimes I feel so bitter about things.	0.73	0.72

Relationship between D-AQ Subscales and Criminal Conducts

Prior to investigating structural links between the aggression factors and CRIMINALITY, descriptive statistics and correlations among D-AQ subscales and two observed measured of CRIMINALITY were inspected. PA was significantly correlated with number of prior arrests (r = .15, p<.05). When the number of prior arrests was ordinalized into three categories PA (r = .24, p<.001) and VA (r = .14, p<.05) subscales were both found to be significantly correlated with this variable.

There were two groups of participants; 109 prisoners(higher criminal involvement) and 159 probationers (lower criminal involvement) that could be expected to score differently on these Aggression Scales based upon the implied level of criminal involvement. Group means for these sub-samples were compared on D-AQ subscales. Table 6 presents means and standard deviations of D-AQ for prisoners as well as probationers. Prisoners had significantly higher scores on PA and VA scores. The effect sizes between two criterion groups were 1.07 on PA and .62 on VA.

Types of criminal charge for current

Table 6. Group Differences between prisoners and probationers on Diamond et al's AQ subscales

	D_Physical Aggression	D_Verbal Aggression	D_Anger	D_Hostility
Prisoners	7.42(2.83)	7.14(2.66)	7.01(2.80)	7.48(2.55)
Probationers	6.35(2.66)	6.52(2.33)	6.45(2.95)	6.96(2.57)
t_{266}	3.15**	2.03*	1.57	1.62

* $p<.05$, ** $p<.01$, *** $p<.001$

incarceration had been coded into three categories based on the criminality of primary charges; property crime, violent crime, and misdemeanor. Unlike the previous result from prisoners versus probationers, analysis of variance indicated that there were no significant group differences on the subscale scores of D-AQ.

Searching for Causal Relationship among Aggression Factors and Criminality

In order to investigate relationships among aggression factors and CRIMINALITY a series of structural models were tested. In these analyses 190 cases were used since cases with missing values on any of the variables of interest were omitted from the data file. The

Table 7. Goodness-of-Fit Statistics for Causal Models

	# variables	X^2	df	X^2/ df	GFI	RMSEA (90% CI)	CFI	NNFI
Model 1 (Figure 1)	34	377.073	74	5.096	0.744	0.147 (.133-.162)	0.577	0.533
Model 2 (Figure 2)	36	107.862	67	1.61	0.921	0.057 (.036-.076)	0.943	0.867
Model 3 (remove b)	36	108.864	68	1.601	0.921	0.056 (.036-.076)	0.943	0.865
Model 4 (remove h)	36	109.406	69	1.586	0.921	0.056 (.035-.075)	0.944	0.865
Model 5 (remove d & c)	36	112.014	71	1.578	0.919	0.055 (.035-.074)	0.943	0.861
Model 6 (remove f)	36	113.293	72	1.574	0.919	0.055 (.035-.074)	0.942	0.86

first model (Model 1) that was tested included only direct effects from all of the AG subscales to the criminality latent variable. AG scales were allowed to correlate freely. As can be seen in Table 7, this model did not fit adequately.

Next a series of nested models were tested in which both direct effects and indirect effects were estimated and tested for significance and fit. These models (shown and Models 2 through 6 in Table 7 and compared graphically in Figure 2) exhibited adequate fit (GFI = .919 - 921, CFI = .942 - .944, NNFI = .860 - .867, RMSEA = .055 - .057), and the most parsimonious of these models (Model 6) did not fit significantly worse than Model 2 when compared using the Chi-Square difference test (Table 8). Therefore, the most parsimonious

Table 8. Chi-square Changes of Causal Models

	X^2	df	⊿X2	⊿df	p
Model 1(Figure 1)	377.073	74			
Model 2(Figure 2)	107.862	67	269.21	7	0.00
Model 3(remove b)	108.864	68	1	1	0.32
Model 4(remove h)	109.406	69	0.55	1	0.46
Model 5(remove d & c)	112.014	71	2.6	2	0.27
Model 6(remove f)	113.293	72	1.28	1	0.26

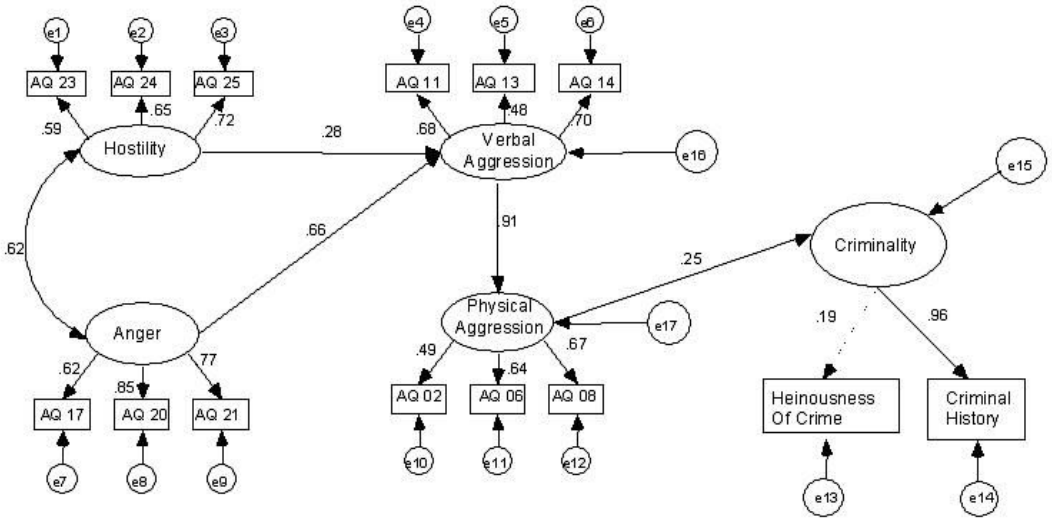

Figure 3. Path Coefficients of Causal Model

Table 9. Regression Weights of each path

	Standardized weights	Unstandardized weights	S.E.	C.R.
Verbal Aggression ← Hostility	0.275	0.304	0.124	2.455*
Verbal Aggression ← Anger	0.660	0.536	0.096	5.576***
Physical Aggression ← Verbal Aggression	0.909	0.987	0.137	7.213***
Criminality ← Physical Aggression	0.253	0.270	0.092	2.932**
AQ 23 ← Hostility	0.588	1.000		
AQ 24 ← Hostility	0.655	1.085	0.177	6.135***
AQ 25 ← Hostility	0.720	1.176	0.185	6.350***
AQ 21 ← Anger	0.772	1.000		
AQ 20 ← Anger	0.851	1.119	0.103	10.866***
AQ 17 ← Anger	0.624	0.811	0.099	8.220***
AQ 11 ← Verbal Aggression	0.684	1.000		
AQ 13 ← Verbal Aggression	0.475	0.761	0.132	5.765***
AQ 14 ← Verbal Aggression	0.702	1.068	0.131	8.146***
AQ 8 ← Physical Aggression	0.672	1.000		
AQ 6 ← Physical Aggression	0.637	1.001	0.143	7.0138***
AQ 2 ← Physical Aggression	0.495	0.786	0.138	5.687***
Crime Type ← Criminality	0.193	0.198	0.327	0.608
# of Priors ← Criminality	0.963	1.000		

* $p < .05$, ** $p < .01$, *** $p < .001$

model was accepted as the final model among candidate causal models.

Table 9 presents the regression weights of each path in the final model. The significance tests showed a plausible causal relationship among latent variables. Figure 3 indicates it as in solid lines. First of all, emotion factor, ANG (=.66, C.R.=5.58, $p<.001$) and cognitive factor HO (=.28, C.R.=2.46, $p<.05$) seem to make causal effects on VA. Then VA might be likely to engender PA (=.91, C.R.=7.21, $p<.001$). And finally PA as action readiness resulted in offenders' violent criminal acts (=.25, C.R.=2.93, $p<.01$). Any direct effects from remote variables, ANG and HO to criminal conducts couldn't reach to the

significance level.

Discussion

The primary purpose of this study was to confirm a factor structure of the version of Korean AQ. Furthermore, the hypothesized causal relationship was explored between aggression factors and behavioral evidences of violence in an offender sample. At a preliminary factor analysis, Diamond et al's model that fit American offenders was reasonably validated for Korean offenders included in this study among parsimonious factor structures with maintaining conceptual framework of Buss and Perry's. All the factor loadings reached to satisfactory level and fitness indices presented good fit of this model.

The additional causal modeling supported that aggression factors might have a causal inter-relationship to produce violent conducts. Even though the sample size shrank to omit the cases with missing values, the aggression factor, PA was related to criminality measured by criminal history and violence of primary charges. The significant paths made to infer that the greater angry and hostile feeling offenders experienced the more they became verbally aggressive and then the probability of this verbal aggression being followed by physical aggression increased. This sequential mechanism was likely to end up with final criminal conducts. This causal relationship looks plausible for this data set, however further validation procedure is needed with other sets of offender data.

The implication of these results is that aggressive disposition may also play an important role in offensive behaviors among Asians who are usually believed to be not so much aggressive as Western offenders. In order to make this proposition to be a validated one the further comparative studies should be performed even though this statement seems fairly plausible at this stage. Also future analyses should focus on revealing the inner structure of aggression. Even among aggression factors, there seems a consistent pathway from input of being attacked in every meaning to output of expressing aggression in an apparent form.

However for criminal conducts the amount of variance to be explained by aggression is very small. In this study, aggressive tendency of offenders accounted for around 10% of variance of their criminal history. In spite of the persuasive causal pathways found in this study, this amount of explanatory power could be easily substituted for other causal factors such as family background or socioeconomic status. Therefore, the interpretation of these results should call careful attention. Also another drawback is all the results were drawn

from cross sectional data rather than longitudinal one. Since variables assumed to be predictors were gathered later in time than collection of the criterion behavior. Therefore, the direction of causal relation seems somewhat reversed. However, logically aggression could be regarded as a causal factor, not a result factor. This is because a disposition of the individual that is inherently indicative of a tendency toward aggressive behavior. Researchers (Eysenck, 1977; Farrington, 1997; Moffit, 1993) presented many times that personality characteristics might be one of the most steady predictors of criminals' lifelong persistence of offences.

In spite of these methodological flaws it seems sufficient to admit aggression is not only one independent structure even for Korean offenders. As expected in many studies, anger and hostile cognitions play important role in making aggressive disposition expressed in concrete behavior. This fact implies treatment programs should be more focused on earlier processes rather than regulating aggressive behavioral patterns such as muscle relaxation. Projective attitudes of offenders to their victims might aggravate transference from anger to physical violence. At the same time, negative emotion should be made to be more conscious. With letting to be aware of their anger and its source, offenders may choose more socially acceptable actions other than aggressive behavioral codes exploding their anger.

There are definitely many types of aggressions (e.g. Bartol, 1999; Myers, 1996). The causal model found in this study from offenders may not fit to other non-offender population. Also this model may fit worse to the specific subpopulation of offenders. Future investigation of this causal model of aggression should also consider the characteristics of target population.

References

Akers, R. L. (1985). *Deviant Behavior: A Social Learning Approach. (3rd ed.).* Belmont, CA: Wadsworth.

Bandura, A. (1983). Psychological mechanisms of aggression. In R. G. Geen & E. I. Donnerstein (Eds.), *Aggression: Theoretical and empirical reviews* (Vol. 1). New York: Academic Press.

Baron, R. A. (1983). The control of human aggression: An optimistic perspective. *Journal of Social and Clinical Psychology, 1,* 97-119.

Bartol, C. R. (1999). *Criminal Behavior: A Psychosocial Approach*. Englewood Cliffs, NJ; Prentice Hall.

Bentler P. M. & Bonnett, D. G. (1980). Significance tests and goodness of fit in the analysis of covariance structures. *Psychological Bulletin, 88,* 588-606.

Berkowitz, L. (1973). Words and symbols as stimuli to aggressive responses. In J. F.

Knutson (Ed.), *The control of aggression*. Chicago, IL: Aldine.

Berkowitz, L. (1989). Frustration-aggression hypothesis: Examination and reformulation. *Psychological Bulletin, 106*, 59-73.

Berkowitz, L. (1993). *Aggression: Its causes, consequences, and control.* New York: McGraw-Hill.

Bernstein, I. H., & Gesn, P. R. (1997). On the dimensionality of the Buss/Perry Aggression Questionnaire. *Behavioral Research and Therapy, 35,* 563-568.

Bohm, R. M. (1982). Radical criminology: An explication. *Criminology, 19*, 565-589.

Browne, M. W. & Cudeck, R. (1993). Alternative ways of assessing model fit. In K. A. Bollen 7 J. S. Long (Eds.) *Testing Structural Equation Models*. Newbury Park: Sage Publications.

Bryant, F. B., & Smith, B. D. (2001). Refining the architecture of aggression: A measurement model for the Buss-Perry Aggression Questionnaire. *Journal of Research in Personality, 35,* 138-167.

Bushman, B. J., Baumeister, R. F., & Phillips, C. M. (2001). Do people aggress to improve their mood? Catharsis beliefs, affect regulation opportunity, and aggressive responding. *Journal of Personality and Social Psychology, 81,* 17-32.

Buss, A. H. (1961). *The Psychology of Aggression*. New York: Wiley.

Buss, A. H. (1971). Aggression pays. In J. L. Singer (Ed.). *The Control of Aggression and Violence*. New York: Academic Press.

Buss, A. H., & Durkee, A. (1957). An inventory for assessing different kinds of hostility. *Journal of Consulting Psychology, 21*, 343-349.

Buss, A. H., & Perry, M. (1992). The Aggression Questionnaire. *Journal of Personality and Social Psychology, 63,* 452-459.

Costanzo, P. R., Brumet, J. F., & Brehm, S. S. (1974). The effects of choice and source of constraint on children's attributions of preference. *Journal of Experimental Social Psychology, 10,* 352-364.

Crick, N. R., & Dodge, K. A. (1996). Social information-processing mechanisms in reactive and proactive aggression. *Child Development, 67*, 993-1002.

Darendorf, R. (1959). *Class and Class Conflict in Industrial society*. Palo Alto, CA: Stanford University Press.

Diamond, P. M., Wang, E. W., & Buffington-Vollum, J. (2003). *Factor structure of the Buss-Perry Aggression Questionnaire (BPAQ) with mentally ill male prisoners.* Manuscript submitted for publication.

Dodge, K. A. (1980). Social cognition and children's aggressive behavior. *Child Development, 51*, 162-170.

Dodge, K. A. (1986). A social information processing model of social competence in children. In M. Permutter (Ed.), *The Minnesota symposium on child psychology*. Hillsdale, NJ: Erlbaum.

Dodge, K. A. (1991). The structure and function of reactive and proactive aggression. In D. Pepler & K. Rubin (Eds.), *The development and treatment of childhood aggression* (pp. 201-218). Hillsdale, NJ: Erlbaum.

Dodge, K. A., Price, J. M., Bachorowski, J. A., & Newman, J. P. (1990). Hostile attributional biases in severely aggressive adolescents. *Journal of Abnormal Psychology, 99*, 385-392.

Dollard, J., Doob, L. W., Miller, N. E., Mowrer, O. H., & Sears, R. R. (1939). *Frustration and aggression*. New Haven, CT: Yale University Press.

Dyke, R. J., & Rule, B. G. (1978). Effect of retaliation on causal attributions concerning attack. *Journal of Personality and Social Psychology, 36,* 521-529.

Eysenck, H. J. (1977). Crime and personality (2nd ed.). London: Routledge & Kegan Paul.

Farrington, D. P. (1997). Early prediction of violent and non-violent youthful offending. *European Journal on Criminal Policy and Research 5*, 51-66.

Fritzon, K., & Garbutt, R. (2001). A fatal interaction: The role of the victim and function of aggression in intrafamilial homicide. *Psychology, Crime & Law, 7*, 309-331.

Gelles, R. J., & Cornell, C. P. (1990). *Intimate Violence in Families*. California: Sage Publications Inc.

Harris, J. A. (1995). Confirmatory factor analysis of the aggression questionnaire. *Behavior Research and Therapy, 33,* 991-993.

Harris, J. A. (1997). A further evaluation of the Aggression Questionnaire: issue of validity and reliability. Behaviour *Research and Therapy, 35*, 1047-1053.

Hu, L. & Bentler, P. M. (1995). Evaluating model fit. In R. H. Hoyle (Ed.), *Structural equation modeling* (pp. 76-99). Thousand Oaks, CA: Sage Publications.

Huesmann, L. R. (1988). An information processing model for the development of aggression. *Aggressive Behavior, 14*, 13-24.

Huss, M. T., Leak, G. K., & Davis, S. F. (1993). A validation study of the Novaco Anger Inventory. *Bulletin of the Psychonomic Society, 31*, 279-281.

Iwata, N., Roberts, C. R., & Kawakami, N. (1995). Japan-US comparison of responses to depression scale items among adult workers. *Psychiatry Research, 58,* 237-245.

Kahn, A. S. (1984). *Social Psychology.* Dubuque, IA: Wm C. Brown Publishers.

Leith, K. P., & Baumeister, R. F. (1996). Why do bad moods increase self-defeating behavior? Emotion, risk taking, and self-regulation. *Journal of Personality and Social Psychology, 71,* 1250-1267.

Lexcen, F., and Redding, R. E.(2000).abuse and dependence in juvenile offenders. *Juvenile Justice Fact Sheet.* Charlottesville, VA: Institute of Law, Psychiatry, & Public Policy, University of Virginia.

Loeber, R., & Dishion, T. (1983). Early predictors of male delinquency: A review. *Psychological Bulletin, 94*, 68-99.

Loeber, R., & Hay, D. (1997). Key issues in the development of aggression and violence from childhood to early adulthood. *Annual Review of Psychology, 48*, 371-410.

Loeber, R., Kalb, L, & Huizinga, D. (2001). Juvenile delinquency and serious victimization. Bulletin. Washington, DC: Department of Justice, Office of Justice Programs, Office of

Juvenile Justice and Delinquency Prevention.

Loeber, R., Stouthamer-Loeber, M., Van Kammen, W. B., & Farrington, D. P., (1991). Initiation, escalation and desistance in juvenile offending and their correlates. *Journal of Criminal Law and Criminology, 82,* 36-82.

Lynch, M. J., & Groves, W. B. (1986). *A Primer in Radical Criminology*. New York: Harrow & Heston.

Marsh, H. W., Balla, J. R. & Hau, K. T. (1996). An evaluation of incremental fit indices: A clarification of mathematical and empirical properties. In G. A. Marcoulides and R. E. Schumacker. (Eds.) Advanced Structural Equation Modeling: Issues and Techniques. Mahwah, N. J.: Lawrence Erlbaum.

Meesters, C., Muris, P., Bosma, H., Schouten, E., & Beuving, S. (1996). Psychometric evaluation of the Dutch version of the Aggression Questionnaire. *Behaviour Research and Therapy, 34*, 839-843.

Moffitt, T. E. (1993). Adolescence-limited and life-course-persistent antisocial behavior: A developmental taxonomy. *Psychological Review, 100*, 674-701.

Myers, D. G. (1996). *Social Psychology*. New York: The McGraw-Hill Companies, Inc.

Nagano, K. (2001). Psychometric evaluation on the Japanese adaptation of the Aggression Questionnaire. *Behaviour Research and Therapy, 39,* 853-858.

Nisbett, R. (1993). Violence and U.S. regional culture. *American Psychologist, 48*, 441-449.

Olweus, D. (1981). Continuity in aggressive and withdrawn, inhibited behavior pattern. *Psychiatry and Social Sciences, 1*, 141-159.

Parke, R. D., & Slaby, R. G. (1983). The development of aggression. In P. H. Mussen & E. M. Hetherington (Eds.), *Handbook of child psychology: Vol. 4. Socialization, personality, and social development* (pp. 547-641). New York: Wiley.

Peterson, W. C., Gonzales, C., & Miller, N. (2000). The moderating effect of trivial triggering provocation on displaced aggression *Journal of Personality and Social Psychology, 78,* 913-927.

Pomara, N., Volavka, J., Czobor, P., & Sidtis, J. (2002). Relationship between verbal and physical aggression in dementia: a pilot study. Paper presented at the meeting of International College of Geriatric Psychoneuropharmacology, Retrieved from July, 19, 2003, from International College of Geriatric Psychoneuropharmacology Web site http://icgp.org/PosAbstracts.htm

Rule, B. G., & Ducker, P. (1973). The effects of intentions and consequences on children's evaluations of aggression. *Journal of Personality and Social Psychology, 27,* 184-189.

Steinberg, M. D., & Dodge, K. A. (1983). Attributional bias in aggressive adolescent boys and girls. *Journal of Social and Clinical Psychology, 1*, 312-321.

Supreme Public Prosecutors' Office of Republic of Korea. (2003). *Analytical Report on Crimes (Written in Korean)*. Seoul: Korea.

Twenge, J. M., Baumeister, R. F., Tice, D. M., & Stucke, T. S. (2001). If you can't join them, beat them: Effects of social exclusion on aggressive behavior. *Journal of Personality and*

Social Psychology, 81, 1058-1069.

Williams, T. Y., Boyd, J. C., Cascardi, M. A., & Poythress, N. (1996). Factor structure and convergent validity of the aggression questionnaire in an offender population. *Psychological Assessment, 8*, 398-403.

Zillmann, D. (1979). *Hostility and Aggression.* Hillsdale, NJ: Earlbaum

1 차 원고 접수일 : 2005. 1. 14
최종 원고 접수일 : 2005. 5. 9

한국심리학회지 : 사회문제
Korean Journal of Psychological and Social Issues
2005, Vol. 11, No. 2, 47 ~71

한국인 범법자들을 대상으로 한 Buss- Perry 공격성 검사지에 대한 요인구조 분석

이 수 정

경기대학교 대학원 범죄심리학과

최근 국내에서는 폭력사건이 크게 증가함에 따라, 범죄행위를 계층간의 갈등이나 비행환경으로 인한 영향으로 해석하려는 사회학적인 원인론보다 범죄자 개인의 역동적인 심리로서 해명하고자 하는 추세가 현저하게 증가하고 있다. 이 같은 추세를 반영하여 본 연구에서는 범죄행위를 사회적인 현상으로보다는 개인적인 문제로 간주하고 심리학적인 이론을 범죄행위에 적용하여 보고자 시도하였다. 공격성을 폭력행위의 기본적인 심리성향으로 간주하고, 공격성을 측정하는 도구로 알려진 BPAQ로 측정된 공격성향과 폭력적인 범죄력간의 관련성을 탐색하였다. 한편 BPAQ의 교차문화 타당도 역시 확인하였는데, 이는 하위문화나 사회계층에 따라 공격행동의 표현양태나 경험방식이 다를 수 있다는 이론적 가설을 확인하기 위해서였다. 변량분석과 인과모형분석 결과, 한국판 BPAQ 단축형은 상당히 만족할만한 수준의 교차문화 타당도를 지녔으며, 국내 범법자들의 폭력행위에 대한 설명력도 적절한 수준인 것으로 확인되었다. 부가적으로 BPAQ의 하위요인들에 대한 내적 구조를 확인적 요인 분석하였다.

주요어 : BPAQ, 공격성, 범법자