

How Robberies Differ based on the Number of Offenders Involved

Jisun Park[†]

Sookmyung Women's University

Ji-Young Kim

Korean Institute of Criminology

Although robbery displays a higher prevalence of involving groups of two or more offenders than other types of violent crimes, there has been little research on differentiating co-offending robberies from lone robberies. To investigate differences among robberies based on the number of offenders involved, we examined 1353 robbery offenses committed in South Korea. Significant differences among robbery offenders across group size were observed with respect to their age, criminal record, occupation, and living status. Additionally, we found notable differences in victim characteristics, including gender, age, victim-offender relationship, and the nature of the victimization. Moreover, differences were noted in offending behaviors, including planning, offense type, method of approach, type of violence, and weapon possession. Furthermore, a number of factors that significantly contributed to predicting the size of the robbery group were identified, including planning, offense type, offender living status, type of violence, and type of victimization. Our study has policy implications for developing early intervention programmes targeting co-offenders and treatment programmes for victims as well as research implications as to how co-offending affects the behaviors of robbery offenders.

Key words : lone robbery; group robbery; co-offending; group size; offending behavior

[†] 교신저자 : 박지선, 숙명여자대학교 사회심리학과, 서울시 용산구 청파로 47길 100
Tel : 02-2077-7832 / E-mail : jsirispark@hotmail.com

Robbery causes physical harm, emotional distress, and financial loss to the victim, and it is one of the most violent crimes that invokes fear in a community(심영희, 1991; 이상호,곽정식, 2007; 황지태, 2004; Matthews, 2002; McCluskey, 2013). Compared to other types of violent crimes, robbery displays a higher prevalence of involving groups of two or more offenders in South Korea(Supreme Prosecutors' Office, 2015). In 2014, 53.8% of robbery offenses were committed by groups of two or more offenders(Supreme Prosecutors' Office, 2015). Offenses involving two or more offenders accounted for only 7.9% of homicide, 6.9% of rape, and 3.9% of arson cases(Supreme Prosecutors' Office, 2015).

The proportion of offenses committed with accomplices differs by crime type, and the relatively high prevalence rates of robbery committed by multiple offenders are a worldwide phenomenon(Carrington, 2002; Reiss & Farrington, 1991; Weerman, 2003). For example, robbery had the highest proportion of crimes committed by multiple offenders(27.9%) among 15 types of crime in the United Kingdom(van Mastrigt & Farrington, 2009). In the United States, 37.9% of robbery incidents involved two or more offenders in 2008(U.S. Department of Justice, 2011), which, again, was the highest among violent crimes including rape and assault. In Canada, 48.6% of robbery incidents involved accomplices, a proportion that was higher than that of violent crimes

such as homicide and sexual assault(Carrington, 2002).

The high prevalence rates for robbery committed with accomplices demands a better understanding of this phenomenon. However, very few studies with detailed analyses of co-offending robberies exist. Moreover, there has been little research on differentiating co-offending robberies from lone robberies. The purpose of this study is to contrast lone robberies with co-offending robberies with respect to offender and victim characteristics and offending behavior. Investigating differences related to variation in the number of offenders among robbery may contribute to extending our knowledge of co-offending and to understanding the impact of co-offending on robbery.

Past Research Comparing Lone and Group Offending in Robbery

Past research has revealed a number of differences between offenses carried out by lone offenders and multiple offenders(Alarid, Burton, & Hochstetler, 2009; Gidycz & Koss, 1990). First, in terms of offender characteristics, group offending is known to be highly associated with younger offenders(Anderson & Felson, 2012; Gagnon & LeBlanc, 1983; van Mastrigt & Farrington, 2009). In addition, Reiss and Farrington(1991) reported that offenders who committed crime in groups when young displayed a general tendency towards offending

alone as their age increased. Second, van Mastrigt and Farrington(2009) reported that a slightly larger proportion of offenses carried out by females than males involved group offending. Third, Alarid et al.(2009) examined robbery offenses specifically and reported that relative to lone offenders, a higher proportion of group offenders had never been married and not completed high school.

With respect to victim characteristics, Harrell (2005) reported that victims of group robberies were younger than those of lone robberies. Group robbery offenders were more likely to target multiple victims than lone offenders(Alarid et al., 2009; Burrell, Bull, Bond, & Herrington, 2015). Groups of two or more perpetrators were far less likely to rob family members and non-family acquaintances than lone offenders (Felson, Baumer, & Messner, 2000).

In terms of offending behaviors, group robberies were associated with higher level of planning than lone robberies(Alarid et al., 2009). Group robberies, by assigning a specific role to each individual involved, may maximize their gains from the offense(van Mastrigt & Farrington, 2009; Weerman, 2003). Indeed, the financial outcome of the offense was much bigger for robberies involving multiple offenders than lone offenders(Felson et al., 2000). Compared to offending alone, co-offending in robbery may benefit more from multiple offenders' specialized knowledge of selecting the target, assessing potential risk, and increasing

probable rewards(Tillyer & Tillyer, 2015; Wright & Decker, 1997). However, some researchers have noted that this may not always be the case, as group offending always has risks of disloyalty and betrayal(Weerman, 2003). Moreover, there was no difference found between lone and group robberies in their victim selection(Alarid et al., 2009).

The presence of co-offenders may contribute to diminishing fear of getting caught and punished(Erikson & Jensen, 1977). Overwhelming victim in numbers and physical superiority, offenders of group robbery may more easily control the victim than offenders of lone robbery(Burrell et al., 2015). Previous studies on group offenses repeatedly reported that committing a crime in a group context led to more severe forms of violence(Gidycz & Koss, 1990; Ullman, 2007). Felson et al.(2000) also reported that victims of robberies committed by multiple offenders were more likely to be injured than those victimized by lone offenders. Interacting with accomplices, perpetrators involved in the same offense may in turn encourage each other's aggressive behavior (McCord & Conway, 2005; McGloin & Piquero, 2009). It should be noted that the more severely the victim gets injured as a result of robbery, the more likely the offense is to be reported to the police and the offenders are to be arrested(Roberts, 2008). Gagnon and LeBlanc (1983) also reported that offenders who committed crime with others had a higher

chance of apprehension than lone offenders.

Although previous research on co-offending robbery has been scarce, researchers have demonstrated notable differences between offenses carried out by lone and multiple offenders. A number of studies on rape reported that offenses involving two perpetrators differed from those involving a group of three or more perpetrators (Amir, 1971; da Silva, Woodhams & Harkins, 2013). In the United States, 18.5% of robbery incidents involved two offenders, and 19.4% involved three or more offenders in 2008(U.S. Department of Justice, 2011). Unfortunately, differences between robberies involving two and groups of three or more offenders still remain under-researched.

Pointing out that past research on co-offending has predominantly focused on why offenders commit crimes together, Tillyer and Tillyer(2015) emphasized the need for more studies on the actual consequences of co-offending in robbery incidents. Based on the 2011 NIBRS(National Incident Based Reporting System) data in the United States, they examined how the number of perpetrators was associated with robbery outcomes. They reported that as the group size of robbery increased, the seriousness of victim injuries and the arrest rate considerably increased. Their findings included that lone perpetrators were far less likely to commit robberies in public sites, at night, and with a weapon than group perpetrators. At the same time, groups of two perpetrators displayed

the highest likelihood of using a weapon, which declined as the group size increased. By dividing the total outcomes of robbery by the number of perpetrators, Tillyer and Tillyer(2015) found that the average financial reward decreased as the group size increased. In contrast to the findings of Felson et al.(2000), Tillyer and Tillyer(2015) reported that perpetrators who acted alone or with one accomplice were less likely to rob victims known to them than perpetrators with two or more accomplices.

The Present Study

Empirical studies exploring co-offending robberies in South Korea and differentiating robbery offenses by the number of offenders are lacking. Our study aims to provide analyses of robbery cases committed in South Korea in detail, including characteristics of offenders and victims and offending behaviors. In addition, we aim to investigate differences among LPR (lone-perpetrator robberies), DPR(double-perpetrator robberies), and GPR(group of three or more perpetrator robberies). Furthermore, we seek to determine the predictors of group size in robbery. It is imperative to better understand group offending in robbery and identify differences among robberies across group size for the following reasons.

First, group crime is reported to be more common with juvenile offenders than adults, which indicates that understanding co-offending

is essential for exploring beginning of a criminal career(Anderson & Felson, 2012; Reiss & Farrington, 1991). Offenses committed by juvenile offenders(aged 18 and less) in South Korea accounted for 3.1% of homicide, 10.2% of rape, 10.8% of arson, and 19.1% of robbery cases(Supreme Prosecutors' Office, 2015). Approximately 88% of juvenile offenders committed robberies in groups(Supreme Prosecutors' Office, 2015). Carrington(2002) also reported that approximately 64% of robbery incidents committed by young offenders aged less than 18 in Canada involved accomplices. Moreover, Conway and McCord(2002) reported that young offenders in co-offending crimes displayed a higher risk of recidivism than solo offending, especially for more violent offenses. Therefore, investigating co-offending in robberies and identifying differences from lone robberies has policy implications for designing intervention strategies for young offenders, especially to prevent them from committing additional offenses(Reiss & Farrington, 1991).

Second, committing crime in groups may easily contribute to facilitating violence(Warr, 2002). The mere presence of others in the context of group crime can cause a diffusion of responsibility and an increased feeling of anonymity, which can provoke more severe forms of violence(Festinger, Pepitone, & Newcomb, 1952; McGloin & Piquero, 2009). When experiencing diffusion of responsibility, perpetrators involved in group offending may

have little hesitation about committing subsequent offenses(McCord & Conway, 2005). Therefore, understanding how variations in the number of offenders may influence robbery and cause differences in offending behaviors has theoretical implications for gaining insights into group dynamics. Moreover, understanding the differential nature of co-offending robbery from lone offending may help to develop strategies to prevent subsequent offenses of perpetrators who have been involved in group offending.

Third, if offending behaviors may differ by the group size in robbery, then the nature of victimization may differ accordingly, which demands differential treatment programmes for victims(Ullman, 2007). For example, previous studies reported that victims of group robberies are more likely to be physically injured than those of lone robberies, and the financial outcome was bigger for group robberies than lone robberies(Felson et al., 2000). Therefore, investigating differences not only between lone and group robberies but also within robberies involving multiple offenders has practical implications for developing efficient victim treatment strategies.

Method

Sample

Our sample contained 1353 robbery offenses

prosecuted in South Korea between 2011 and 2013. A total of 16 Public Prosecutor Offices in 12 South Korean cities, namely Seoul, Busan, Incheon, Suwon, Euijeongbu, Daejeon, Gwangju, Daegu, Ulsan, Jeonju, Changwon, and Cheongju, provided us the cases. The case files included incident reports, victim statements, police investigation records, and offender interviews.

Our data comprised 460 LPR offenses, 242 DPR offenses, and 651 GPR offenses. The group size of robbery offenders ranged from one to 12(see Table 1). Among co-offending robberies, offenses carried out by two offenders were the most common, accounting for 27.1%(N = 242) of the co-offending cases(N = 893). Previous research on co-offending robbery also demonstrated that two was the most prevalent group size(Tillyer & Tillyer, 2015; U.S. Department of Justice, 2011).

Among the 1335 cases in which the offense type was known, 45.1%(n= 602) were break-in robberies, 32.3%(n= 431) were street robberies, 8.4%(n= 112) were robberies committed after approaching under the guise of prostitution, 4.9%(n= 66) were kidnap robberies, 2.2%(n= 29) were hostage robberies, and 7.1%(n= 95) were other types, including robberies committed

after attempted rape.

Most of offenders in our sample were male(90.8%, n= 1229) and only 9.2%(n= 124) were female. The mean age of offenders was 25.77 years(SD = 11.0). Their ages ranged between 10 and 73 years(median = 22, mode = 17). Among the 1337 cases in which previous convictions of the offender were known, 22.4%(n= 300) had previously committed robbery.

Among the 1338 offenses in which the victim's gender was known, 53.7%(n= 719) were male, and 46.3%(n= 619) were female. Except for 47 offenses in which the victim's age was missing, 0.2%(n= 3) were less than ten years old, 15.0%(n= 196) were teenagers, 26.3%(n= 343) of the victims were in their 20s, 19.1%(n= 249) were in their 30s, 15.2%(n= 199) were in their 40s, 15.2%(n= 198) were in their 50s, and 9.0%(n= 118) were more than 60 years old. Regarding the victim-offender relationship, 67.5%(n= 913) were strangers, 20.1%(n= 272) had just met before the robbery, 5.3%(n= 72) were friends/lovers, and 4.5%(n= 61) were acquaintances. In 2.0%(n= 27) of the cases the offender knew the victim, but not vice versa. Additionally,

Table 1. Number of Offenders in Robbery

Number of offenders	1	2	3	4	5	6	7	8	9	10	11	12	Total
N	460	242	202	181	154	29	58	8	11	1	2	5	1353
%	34.0	17.9	14.9	13.4	11.4	2.1	4.3	0.6	0.8	0.1	0.1	0.4	100

0.1%(n= 2) were relatives, and 0.5%(n= 6) were others, such as co-workers and neighbors.

Procedures

To provide analyses of robberies in detail and investigate differences among robberies across group size, information about offender/victim characteristics and offending behaviors were examined. First, variables regarding offender characteristics included age, gender, criminal record, occupation, living status, marital status, and drinking before the offense. Second, we investigated victim characteristic by employing variables such as gender, age, and the victim-offender relationship. Additionally, the nature of victimization that victims experienced was examined: whether the victim was physically assaulted, whether the property was stolen, and whether the victim was sexually assaulted.

Third, offending behavior variables included offense type, area, evidence left at the scene, approach method, type of violence, possession of a weapon, possession of ligature, wearing gloves or a cap, use of car/motorcycles, and whether the offenders were arrested at the scene were analyzed. Premeditation of the offense was investigated by using variables such as planning, pre-selecting a target, pre-visiting a target area, preparing a weapon or a tool, and seeking out an escape route in advance. Moreover, we determined whether offenders travelled from where they had met the victim to where they

committed the offense, and, if they travelled, whether the offenders travelled on foot or by car.

We conducted data analyses by using SPSS 22.0. We investigated differences among LPR, DPR, and GPR using Kruskal-Wallis and Mann-Whitney U tests for continuous variables and Chi-square analyses for categorical variables. When multiple comparisons were made, a Bonferroni correction was used to control for the inflation of Type I errors(in this case, the corrected p value of .0167). In addition, to determine predictors of the size of the robbery group, multinomial logistic regression analyses were employed.

Results

Robberies across Group Size: Differences in Offender Characteristics

Significant differences were evident with respect to offender characteristics among robberies across group size. We found differences in the offender age among LPR, DPR, and GPR. As the distribution of the variable of age, shown by Kolmogorov-Smirnov and Shapiro-Wilk tests, was not normal, Kruskal-Wallis and Mann-Whitney U tests were employed to compare all three groups together and two groups at a time, respectively.

The three groups differed by offender age

at the time of the offense(Kruskal-Wallis= 515.257, $p = .000$). Pairwise comparisons demonstrated that offenders involved in GPR were younger($M = 19.69$, $SD = 6.7$) than double offenders($M = 27.92$, $SD = 11.7$), who were, in turn, younger than lone offenders($M = 33.25$, $SD = 10.5$). All pairwise comparisons were significant($p = .000$).

The results of the Chi-square tests with respect to difference in offender and victim

characteristics are shown in Table 2. It was assured that none of the cells contained expected frequencies less than five.

Substantial difference among the LPR, DPR, and GPR groups was noted in offender gender. Most robbery offenses across the group size were committed by males. However, 17.1%($n = 111$) of offenders in GPR were female, whereas only 1.5%($n = 7$) of the lone offenders and 2.5%($n = 6$) of double offenders were female.

Table 2. Robberies across Group Size: Differences in Offender and Victim Characteristics

Offender Characteristics	LPR	DPR	GPR	χ^2	Φ
Gender -male	453(98.5%) _a	236(97.5%) _a	540(82.9%) _b	93.9***	.263
Criminal record -robbery	168(36.7%) _a	65(27.0%) _b	67(10.5%) _c	108.4***	.285
Student	30(6.5%) _a	30(12.4%) _b	171(26.3%) _c	78.7***	.241
Living alone	202(48.6%) _a	60(26.0%) _b	102(16.9%) _c	121.1***	.311
Single	314(68.3%) _a	169(69.8%) _a	564(86.6%) _b	61.5***	.213
Had a drink before offense	150(34.3%) _a	48(20.6%) _b	72(11.2%) _c	84.9***	.254
Victim Characteristics	LPR	DPR	GPR	χ^2	Φ
Gender -male	132(28.8%) _a	96(40.2%) _b	491(76.6%) _c	266.8***	.447
Age -20s	134(29.1%) _a	46(19.0%) _b	163(25.0%) _{ab}	8.6*	.080
Age -30s	61(13.3%) _a	38(15.7%) _{ab}	150(23.0%) _b	18.6***	.117
Age -50s	71(15.4%) _{ab}	48(19.8%) _b	79(12.1%) _a	8.7*	.080
Age -60s and more	53(11.5%) _a	22(9.1%) _{ab}	43(6.6%) _b	8.2*	.078
V-o relationships: stranger	321(69.8%) _{ab}	180(74.4%) _b	412(63.3%) _a	11.5**	.093
V-o relationships: just met	93(20.2%) _{ab}	34(14.0%) _b	145(22.3%) _a	7.4*	.074
Physically assaulted	194(42.2%) _a	121(50.0%) _a	386(59.3%) _b	32.0***	.154
Property stolen	357(77.6%) _a	196(81.0%) _{ab}	550(84.5%) _b	8.5*	.079
Sexually assaulted	94(20.4%) _a	15(6.2%) _b	15(2.3%) _c	109.5***	.285

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

Significant differences among the three groups were observed in terms of whether they had a criminal record of robbery. Compared to those in GPR, double and lone offenders were more than twice and three times as likely to have previously committed robbery, respectively.

Significant differences were also noted in terms of whether they were students at the time of the offense. The proportion of offenders in LPR who were students was smaller than that of offenders in DPR, which was, in turn, smaller than that of offenders in GPR.

The living status of offenders at the time of the offense also differed significantly. The proportion of lone offenders who lived alone was significantly larger than that of double offenders, which was, in turn, larger than that of GPR offenders.

Most offenders, regardless of the group size, were single. However, offenders in GPR were more likely to be single than those in the two other groups. The difference between lone and double offenders was not significant as to the proportion of offenders being single.

The three groups demonstrated a significant difference as to whether they had a drink before the offense. The proportion of offenders in GPR who had a drink before offending was significantly smaller than that of offenders in DPR, which was, in turn, smaller than that of offenders in LPR.

Differences in Victim Characteristics

Most offenders in GPR attacked male victims, whereas less than half of the double and less than one-third of the lone offenders did. The three groups also differed with respect to the victim's age. First, a bigger proportion of lone offenders attacked victims in their twenties than double offenders did. Second, a larger proportion of offenders in GPR attacked victims in their thirties than lone offenders did, whereas a bigger proportion of lone offenders than offenders in GPR attacked victims aged 60 or more. Third, compared to double offenders, offenders in GPR were less likely to attack victims in their fifties. Differences regarding victims under 20 and victims in their forties were not statistically significant among the three groups ($\chi^2(2) = 0.18$, $\chi^2(2) = 4.73$, respectively).

In addition, the three groups also differed by the victim-offender relationship. Double offenders were more likely to target a stranger than offenders in GPR. Although offenders in GPR were more likely to target someone they had just met than double offenders, the difference was not statistically significant when considering the Bonferroni correction ($p = .024$).

A significantly larger proportion of victims of GPR reported that they were physically assaulted than either the lone or double offenders did. Moreover, victims of GPR were more likely to report that their property was stolen than those of LPR. The three groups also differed

significantly with respect to whether the victims were sexually assaulted. Notably, victims of LPR were over three and eight times more likely to report that they were sexually assaulted as those of DPR and GPR did, respectively.

Differences in Offending Behaviors

Differences in offending behaviors are shown in Tables 3 and 4. Above all, LPR, DPR, and GPR differed by the offense type. The majority

of LPR involved break-in robbery, whereas about half of DPR and one fourth of GPR did. Compared to LPR, both DPR and GPR were more likely to commit street robbery.

In addition, significant differences were evident with respect to the crime area. Offenders in GPR were more likely to commit offenses in commercial areas compared to either the lone or double offenders. In contrast, lone offenders were significantly more likely to commit offenses in residential area than the other two groups.

Table 3. Robberies across Group Size: Differences in Offending Behaviors

Variable	LPR	DPR	GPR	χ^2	Φ
Type: break-in robbery	314(68.3%) _a	118(48.8%) _b	170(26.1%) _c	196.0***	.381
Type: street robbery	87(18.9%) _a	88(36.4%) _b	256(39.3%) _b	54.4***	.201
Area -commercial	181(39.3%) _a	115(47.5%) _a	381(58.5%) _b	40.3***	.173
Area -residential	263(57.2%) _a	107(44.2%) _b	231(35.5%) _b	51.3***	.195
DNA evidence left	104(22.6%) _a	18(7.4%) _b	25(3.8%) _b	101.6***	.274
Fingerprint/footprint left	68(14.8%) _a	22(9.1%) _a	15(2.3%) _b	59.3***	.209
Approach -blitz	92(20.0%) _a	82(33.9%) _b	145(22.3%) _a	18.1***	.116
Approach -kidnap	12(2.6%) _a	35(14.5%) _b	94(14.4%) _b	45.5***	.184
Approach -threat	179(38.9%) _a	47(19.4%) _b	171(26.3%) _b	34.7***	.160
Approach -surprise	44(9.6%) _a	48(19.8%) _b	85(13.1%) _a	14.7**	.104
Approach -use alcohol	14(3.0%) _a	7(2.9%) _a	91(14.0%) _b	53.7***	.199
Approach -con	150(32.6%) _a	73(30.2%) _a	284(43.6%) _b	20.6***	.124
Violence -weapon threat	249(54.1%) _a	52(21.5%) _b	93(14.3%) _c	215.6***	.399
Violence -verbal	270(58.7%) _a	83(34.3%) _b	240(36.9%) _b	63.0***	.216
Violence -bind	70(15.2%) _a	41(16.9%) _a	37(5.7%) _b	36.0***	.163
Violence -confine	23(5.0%) _a	21(8.7%) _{a,b}	74(11.4%) _b	13.7**	.101
Violence -force	175(38.0%) _a	102(42.1%) _a	142(21.8%) _b	50.4***	.193

** p <.01, *** p <.001

Table 4. Robberies across Group Size: Differences in Offending Behaviors

Variable	LPR	DPR	GPR	χ^2	Φ
Weapon possession	263(57.2%) _a	78(32.2%) _b	116(17.8%) _c	186.9***	.372
Ligature possession	76(16.5%) _a	58(24.0%) _a	53(8.1%) _b	41.3***	.175
Wearing gloves	57(12.4%) _a	27(11.2%) _a	24(3.7%) _b	31.8***	.153
Wearing a cap	96(20.9%) _a	75(31.0%) _b	33(5.1%) _c	110.8***	.286
Using car/motorcycles	23(5.0%) _a	52(21.5%) _b	126(19.4%) _b	54.1***	.200
Arrested at scene	88(19.1%) _a	23(9.5%) _b	50(7.7%) _b	35.3***	.162
Planning	120(26.1%) _a	154(63.6%) _b	491(75.4%) _c	273.0***	.449
Pre-selecting the victim	99(21.5%) _a	50(20.7%) _a	251(38.6%) _b	48.7***	.190
Pre-visiting the site	49(10.7%) _a	40(16.5%) _{ab}	122(18.7%) _b	13.5**	.100
Seeking out an escape route	27(5.9%) _a	32(13.2%) _b	43(6.6%) _a	13.8**	.101
Preparing tools/weapons	194(42.2%) _a	122(50.4%) _a	163(25.0%) _b	63.6***	.217
Did not travel	357(77.6%) _a	145(59.9%) _b	341(52.4%) _b	73.7***	.233
Travelling by car	14(3.0%) _a	47(19.4%) _b	80(12.3%) _c	50.2***	.193
Travelling on foot	75(16.3%) _a	42(17.4%) _a	207(31.8%) _b	42.5***	.177

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

The three groups differed in relation to whether they left evidence at the crime scene. Lone offenders were significantly more likely to leave DNA evidence than the other two groups, and offenders in GPR were significantly less likely to leave fingerprints and/or footprints than either the lone or double offenders.

Moreover, the three groups did differ in the method of approach. DPR were significantly more likely to involve a blitz attack and a surprise attack than both LPR and GPR. Relative to offenders in LPR, offenders in DPR and GPR were more likely to kidnap the victim and less likely to use threats when approaching

the victim. Offenders in GPR were more likely than either the lone or double offenders to use alcohol to lure the victim and to con the victim by pretending to be police, asking directions, etc.

The three groups also differed in terms of the use of violence at the scene. Lone offenders were over two and three times more likely to make threats with a weapon as offenders in DPR and GPR, respectively. Lone offenders were also significantly more likely to verbally abuse the victim than the other two groups. Compared to offenders in GPR, both lone and double offenders were more likely to bind the victim

and use force against the victim. In contrast, offenders in GPR were more likely to confine the victim than lone offenders.

The proportion of lone offenders who possessed weapons was significantly larger than that of double offenders, which was, in turn, larger than that of offenders in GPR. Compared to offenders in GPR, both lone and double offenders were more likely to possess ligature and wear gloves at the time of the offense. The proportion of double offenders who wore a cap was significantly bigger than that of lone offenders, which was, in turn, bigger than that of offenders in GPR. Relative to lone offenders, offenders in DPR and GPR were more likely to use a car or motorcycles for the offense. In addition, lone offenders were significantly more likely to be arrested at the crime scene than the other two groups.

The three groups differed significantly in terms of the premeditation of the offense. The proportion of offenders in GPR who planned the offense in advance was significantly larger than that of double offenders, which was, in turn, bigger than that of lone offenders. Offenders in GPR were more likely to pre-select a victim or a target and less likely to prepare a tool or a weapon than either lone or double offenders. Offenders in GPR were more likely to visit a target area in advance than the lone offenders. Double offenders were significantly more likely to seek out an escape route in advance than the other two groups.

The majority of lone offenders did not travel; they committed the robbery at the same site as they met the victim. However, relative to lone offenders, offenders in DPR and GPR were more likely to travel. The proportion of double offenders who travelled by car was significantly larger than that of offenders in GPR, which was, in turn, larger than that of lone offenders. In contrast, offenders in GPR were significantly more likely to travel from where they had met the victim to where they committed the offense on foot than the other two groups.

Multinomial Logistic Regression Analyses for Predicting the Size of Robbery Group

To determine the predictors of the size of the robbery group, multinomial logistic regression analyses were conducted. The size of the robbery group was the dependent variable (one for LPR, two for DPR, and three for GPR). We selected variables with the largest effect size in prior analyses as independent variables. There were seventeen variables of which the effect size was more than .21, which can be considered a medium effect (Cohen, 1988): 'gender -male (offender)', 'criminal record -robbery(offender)', 'student(offender)', 'living alone(offender)', 'marital status -single (offender)', 'had a drink before the offense(offender)', 'gender -male (victim)', 'sexually assaulted(victim)', 'offense type: break-in robbery', 'DNA evidence left', 'violence

Table 5. Multinomial Logistic Regression Predicting the Number of Offenders in Robbery

Likelihood of being an LPR than a DPR	β	S.E.	Wald	p	Exp(β)
Planning	-1.455	0.229	40.510	0.000	0.233
Victim gender -male	-0.309	0.220	1.966	0.161	0.734
Violence-weapon threat	0.948	0.369	6.612	0.010	2.580
Type: Break-in robbery	0.684	0.232	8.691	0.003	1.981
Weapon possession	0.679	0.355	3.666	0.056	1.972
Offender living alone	0.967	0.217	19.773	0.000	2.629
Offender wearing a cap	-0.873	0.258	11.472	0.001	0.418
Victim sexually assaulted	0.890	0.381	5.456	0.020	2.436
Criminal record -robbery	-0.252	0.248	1.036	0.309	0.777
DNA evidence left	0.631	0.345	3.350	0.067	1.880
Offender gender -male	0.114	0.637	0.032	0.857	1.121
Offender having a drink before offense	0.533	0.237	5.042	0.025	1.704
Offender -student	-0.577	0.340	2.875	0.090	0.562
Did not travel	0.909	0.234	15.093	0.000	2.482
Preparing tools/weapons	-0.767	0.279	7.550	0.006	0.464
Violence -verbal	0.504	0.216	5.422	0.020	1.655
Offender -single	-0.403	0.235	2.946	0.086	0.668
Likelihood of being an LPR than a GPR	β	S.E.	Wald	p	Exp(β)
Planning	-2.292	0.232	97.905	0.000	0.101
Victim gender -male	-1.367	0.216	40.132	0.000	0.255
Violence -weapon threat	0.541	0.376	2.072	0.150	1.718
Type: Break-in robbery	1.409	0.231	37.279	0.000	4.092
Weapon possession	0.754	0.359	4.415	0.036	2.125
Offender living alone	1.162	0.219	28.244	0.000	3.198
Offender wearing a cap	0.546	0.301	3.287	0.070	1.726
Victim sexually assaulted	1.247	0.419	8.849	0.003	3.478
Criminal record -robbery	0.208	0.271	0.587	0.444	1.231
DNA evidence left	0.719	0.371	3.761	0.052	2.052
Offender gender -male	1.986	0.524	14.343	0.000	7.288
Offender having a drink	1.308	0.245	28.403	0.000	3.697
Offender -student	-1.328	0.305	18.934	0.000	0.265
Did not travel	0.461	0.234	3.885	0.049	1.586
Preparing tools/weapons	-0.218	0.284	0.593	0.441	0.804
Violence -verbal	0.352	0.212	2.759	0.097	1.421
Offender -single	-0.903	0.249	13.188	0.000	0.405

Note: -2 log likelihood = 1328.047, $R^2=.545$ (Cox&Snell), $R^2=.625$ (Nagelkerke)

-weapon threats', 'violence -verbal, 'weapon possession', 'wearing a cap', 'planning', 'preparing tools/weapons, and '(offender) did not travel'.

The model was significant($\chi^2(34) = 951.193$, $p < .001$, see Table 5). Relative to double offenders, lone offenders showed a higher probability of making threats with a weapon, committing a break-in robbery, living alone, sexually assaulting the victim, having a drink before the offense, committing robbery at the same site as they met the victim, and verbally abusing the victim. In contrast, lone offenders were less likely than double offenders to plan the offense in advance, wear a cap, and prepare a tool or a weapon.

Furthermore, in contrast to offenders in GPR, lone offenders showed a higher probability of committing a break-in robbery, possessing a weapon, living alone, sexually assaulting the victim, being male, having a drink before the offense, and committing robbery at the same site as they met the victim. Compared to lone offenders, offenders in GPR were more likely to plan the offense in advance and attack male victims. In addition, offenders in GPR presented a higher probability of being a student and being single than lone offenders.

Discussion

We examined differences among robberies

across group size with respect to offender and victim characteristics and offending behaviors by using a sample of 1353 cases of robbery. Our study demonstrated notable differences among LPR, DPR, and GPR and identified variables that can contribute to predicting the size of robbery groups, which include offense planning, offense type, offender living status, type of violence, type of victimization, and the offender having a drink before the offense.

Our study confirmed that offenders who commit crime with others tend to be younger than those who act alone(Anderson & Felson, 2012; Gagnon & LeBlanc, 1983; van Mastrigt & Farrington, 2009). Moreover, the present findings revealed age differences within group offenses, showing that offenders in GPR were significantly younger at the time of the offense than offenders in DPR. At the same time, our study showed that compared to offenders in GPR, offenders in DPR and LPR were more than twice and three times as likely to have previously committed a robbery, respectively. These findings altogether suggest that as they become older, offenders who used to co-offend increasingly tend to commit crimes alone(Reiss & Farrington, 1991). Therefore, the study again indicates that understanding co-offending is indeed essential for exploring the beginning and development of a criminal career(Anderson & Felson, 2012; Reiss & Farrington, 1991). Furthermore, our study emphasizes that early intervention programmes are required for young

offenders who co-offend to prevent them from recidivating and developing a criminal career as they grow older.

The three groups notably differed in the nature of their victims. First, a greater proportion of victims of GPR were physically assaulted than those of LPR and DPR. Previous studies repeatedly reported that co-offending, through the process of an increased feeling of anonymity and diffused responsibility, may easily lead to the facilitation of violence(McCord & Conway, 2005; McGloin & Piquero, 2009; Warr, 2002). Second, the proportion of victims whose property was stolen was larger for GPR than LPR, which is similar to the previous finding that the financial outcome was bigger for group robberies than lone robberies(Felson et al., 2000). Third, the three groups substantially differed by whether victims were sexually assaulted. These results combined together indicate that the nature of victimization does vary across group size: victims of LPR may need different assistance and treatment plans from those of DPR or GPR. The current study has practical implications for developing efficient treatment programmes for robbery victims. Providing educational programmes for mental health professionals and victim care providers is needed to help them understand the differential nature of victimization and the consequences that victims may experience after the crime depending on the group size of the robbery.

Previous research reported that co-offending

robberies were associated with a higher level of planning than lone robberies(Alarid et al., 2009). Our study showed that the three groups did differ significantly by the planning of the offense: offenders in GPR displayed the highest level of pre-planning. Seeking out an escape route in advance was the only behavior that double offenders were more likely to display than the other two groups. In contrast, our study revealed that offenders in LPR were more likely to have a drink before the offense, to be arrested at the crime scene, and to leave DNA evidence than the other two groups. At the same time, it is worth noting that lone offenders were more than three times as likely to have previously committed robbery than offenders in GPR. These findings suggest that the behavior of robbery planning may be more likely to be associated with having accomplices than the offender's criminal history. More research is needed to identify the association between planning, criminal history, and group size in robbery, possibly with offender variables such as age and gender controlled(박지선, 최낙범, 2010).

Little empirical research exists on the differences between robberies involving two and groups of three or more offenders. Considerable differences were evident in our study between DPR and GPR: A higher proportion of offenders in GPR than DPR were students and single, whereas a higher proportion of offenders DPR than GPR were male, had previously committed

robbery, lived alone, and had a drink before the offense. Victims of DPR differed from those of GPR in many aspects, such as in their gender, relationship with the offender, and the nature of the victimization. DPR and GPR significantly differed by offense type, offense area, method of approach, use of violence, weapon and ligature possession, use of gloves and a cap, and offense planning. Our findings emphasize the urgent need to differentiate DPR from GPR and investigate variations within co-offending robberies. Our findings need to be replicated with other samples in future studies.

Tillyer and Tillyer(2015) is one of a few studies that had examined differences in group robberies by number of offenders. Both Tillyer and Tillyer(2015) and the present study demonstrated that robberies with accomplices were more likely to involve male victims than lone robberies and that victims of GPR were more likely to be physically assaulted than both those of LPR and DPR. However, discrepancies do exist. First, our study showed that the three groups differed as to whether they had a drink before the offense. However, Tillyer and Tillyer (2015) reported no differences with respect to whether the offender was under the influence during the offense. Second, Tillyer and Tillyer (2015) reported that lone offenders were less likely than group offenders to commit robberies with a weapon, which was the exact opposite of our findings that lone offenders were more likely to possess a weapon and make threats with a

weapon than the other two groups. The result is consistent with the notion of Reiss and Farrington(1991) that solo offenders may need a weapon as a substitute for the force of accomplices. Relative to lone offenders, group offenders who overwhelm their victim with numbers may more easily control the victim without a weapon(Burrell et al., 2015). Interestingly, what Tillyer and Tillyer(2015) also found is that groups consisting of two offenders displayed the highest likelihood of using a weapon among co-offending robberies, and it declined as the group size increased. This is confirmed in our study that double offenders were more likely to possess a weapon and make threats with a weapon than offenders in GPR. Discrepancies between the two studies may result from use of samples in different countries(the U.S. and South Korea) and differences that may exist in the method of defining variables. Moreover, some of the core variables in Tillyer and Tillyer(2015) were not included in our study(e.g., robbery outcome per offender and the total arrest rate). In future research, these variables need to be examined and the findings of the study need to be replicated to test whether these discrepancies are related to cultural differences.

The study has a number of limitations that must be addressed. First, caution should be exercised as lone robberies may be under-represented and group robberies may be over-represented in our sample. Previous research

suggest that lone offenses have a higher likelihood of remaining unreported, group offenders have a higher likelihood of being apprehended and group offenses tend to be overrepresented in official statistics(Erikson, 1971; Erikson, 1973; Hindelang, 1971). Therefore, our sample comprising cases that were prosecuted may not be representative of the general characteristics of robberies. Therefore, the external validity of the present findings may be considerably limited. Second, because of the small size of the sample, the present findings need to be replicated with larger samples.

The study includes extensive variables regarding the offender, victim, and behavioral characteristics of robberies. Our findings provide a detailed description of differences among robberies across group size. The present results contribute to advancing the knowledge of robbery and group offending, especially the variations between lone and group robberies as well as within robberies with accomplices.

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공범의 수에 따른 강도 범죄의 차이

박 지 선

숙명여자대학교 사회심리학과

김 지 영

한국형사정책연구원

강도 범죄는 다른 강력범죄와 비교해서 공범에 의해 저질러지는 비율이 상대적으로 높음에도 불구하고, 공범에 의한 강도 범죄의 특성을 살펴본 연구는 여전히 미흡한 실정이다. 따라서 본 연구에서는 공범의 수에 따라 강도 범죄의 특성이 어떻게 달라지는지를 살펴보았다. 이를 위해 국내 총 1,353건의 강도 사건을 바탕으로, 가해자 및 피해자 특성, 범행 수법에서의 차이점을 조사하였다. 우선, 공범의 수에 따라 강도 범죄 가해자의 나이와 전과, 직업 등에서 유의한 차이점을 발견하였다. 또한 피해자 특성에 있어서도, 피해자의 성별과 나이, 가해자와의 관계 등에서 공범의 수에 따른 차이가 나타났다. 더불어 계획성과 강도 범죄의 유형, 피해자 접근법, 폭력성 및 흉기 소지 등 범행 수법에 있어서도, 공범의 수에 따라 현저한 차이점이 드러났다. 본 연구 결과를 바탕으로, 특히 공범이 저지른 강도 범죄를 대상으로 해서 이를 예방하고 재범을 방지하기 위한 범죄자 초기 개입 프로그램의 필요성에 관해 논의하였다. 또한, 범행에 가담한 공범의 수에 따라 피해자들의 피해 내용과 후유증이 달라질 수 있음을 인지하고, 이를 통해 차별화된 피해자 치료 프로그램의 발전에 대해 본 연구가 가지는 함의에 대해 논의하였다.

주제어 : 단독 강도, 집단 강도, 공범, 공범 수, 범행수법