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Actual Improvement Plan of the English Language Proficiency of Tourism POLICE in KOREA

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Abstract

Purpose; The purpose of this study is to examine and analyze the English ability and operation status of the Korean tourism police officers, to find out the problems, and to find out more effective tourism police officer's English ability according to the characteristics of the tourism police.

For this purpose, we examined the English ability of the tourism police officers who are performing actual work, and analyzed the importance of English ability in accordance with some of the representative cases in tourist attractions around the world. Also, this study analyzed the problems and difficulties of English language ability that tourism police officers consider to be important in real work environment in order to make improvements in current English test and education system.

As a result of examining the cases of foreign tourism police, the most common case of English utterance is when they need to give help in solving the inconveniences of foreign tourists while enjoying the visit in tourist attractions. The necessity of English was most emphasized in speaking and listening to the basic vocabulary and expressions used by foreign tourists, and the difference of accent by culture was one of the factors that caused difficulties in mutual communication. The main topic of communication between foreign tourists and tourism police officers was mainly on asking and responding to directions, giving some explanation of the tourism sites, taking complaints of various inconveniences around the attraction spots. Therefore, it is necessary to design the test and curriculum for a special purpose English required by the tourism police in order to meet the actual work condition.

[Keywords] Policing, Tourism Police, ESP, English Proficiency, Functional Use

1. Introduction

The number of foreign tourists visiting Korea has been steadily increasing, exceeding 10million by 2012 and has reached 14.2 million by 2014. In addition to the increasing number of foreign tourists, the number of reported inconveniences by foreign tourists has also increased resulting in 1093 cases in 2012, 1107 cases in 2013, 1154 cases in 2014, and 1310 cases in 2016, respectively. However, there was a slight fall in numbers during 2015 because of the MERS(Middle East Respiratory Syndrome) incident[1].

■Table 1. Reported tourist inconvenience case.

Year	Total number received
2012	1,093
2013	1,107
2014	1,154
2015	1,061
2016	1,310

The National Police Agency promoted the introduction of tourism police, judging that illegal activities targeting foreign tourists might cause dissatisfaction of Korean tourists and make them hesitant to visit Korea again.

The National Police Agency promoted the introduction of tourism police, judging that illegal activities targeting foreign tourists might cause dissatisfaction of Korean tourists and make them hesitant to visit Korea again. In October 2013, the National Police Agency held a ceremony for the opening of the Tourism Police under the slogan, “A tourism police officer with excellent foreign language ability will solve the inconvenience of foreign tourists visiting Korea”. The Ministry of Tourism Police announced that the organization was composed of police with excellent foreign language ability at the time. However, 63% of the interviewees scored less than 40 points out of 50 points scale which is lower than the average score of auxiliary police officers.

Also, the TOEIC score, between 650 to 800 points, of the police officer which was submitted as the reference data was found to be insufficient to categorize their language proficiency as top class. In the case of Chinese, HSK 3rd ~4th grade certificate was submitted, which is considered the elementary and intermediate level. These certificates even lower than the basic qualification of the tourist interpreter who needs to send in a certificate of HSK level 5 or above[2]. Therefore, it is necessary to improve the basic English fluency level of the tourism police and the needs for ESP(English for Special Purpose) education must be followed to deal with illegal acts against foreign tourists and resolve complaints. ESP refers to English for special purpose which focuses on improving English proficiency for situational environment as opposed to learning general English skills. According to the universal classification method, ESP is divided into English for Academic Purposes(EAP) and English for Occupational Purposes(EOP).

The English language course was not sufficient enough to meet the needs of learners who needed to learn English for specific purposes. As a result, the study of ESP emerged during the 1960s. The importance of learning ESP has emerged due to the need for English learning to meet specific objectives as the combination of the specificity of English language. Foreign language learners generally learn the target language with a sense of the

necessity to learn the target language. Therefore, the most important factor in ESP course/test design is to go through a thorough learner centered needs analysis. As a result, an empirical examination of the effectiveness of English tests, one of the prerequisites in the process of recruiting police officers, is needed and it can be considered that the tourism police officers need special education and test that can confirm the verification of actual English proficiency[3][4][5].

In this study, we navigate the current English test that is being conducted in the police officer recruitment process in the purpose of finding out the effectiveness and give resolution on improving the English course and test to meet the tourism officers’ needs according to their work environment.

2. Preceding Research

2.1. Preceding researches

Police officers perform individual tasks to protect the public, arrest criminals, supervise and regulate illegal activities to provide guidance and civil service. Therefore, it is important to recruit talented individual with appropriate skills for completing the given task. Even after they are employed, it is necessary to allocate them in appropriate departments through Job Analysis. Due to the nature of the tourism police duty, countering illegal activities against foreign tourist and resolving complaints, the importance of recruiting talented candidate who has appropriate capacity in foreign language skills and educating target language to make them able to deal with the unique working environment.

The recruiting test of the police officers are designed to meet the following criteria and the English test, which is one of the test subjects, is designed with the same premises[6].

•Table 2. Principles of examination.

Equal opportunities for applicants
Predict candidate’s job ability, behavior, post-exam mind-set
Assessing potential of the candidate
Evaluate and rank candidate’s grades transparently and objectively

These criteria are designed to make it easier to rank all the candidates by sorting out whether the candidates test score is above or under the pass/fail level. In the case of the English test, there is a considerable gap between the test scores and the actual language used in the working environment or the needs of the tourism officers. Thus, it is necessary to introduce ESP education and test which can offer practical help for those who need it.

In the field of ESP, centered in Korea, there are not so many studies related with the situational distinctiveness of tourism police. In addition, from a practical point of view, English proficiency of tourism police officers who deals with foreign tourists is not good enough to meet the needs of tourists[2].

In the case of an English test for police officers, a reasonable ESP test and curricula should be introduced that is designed to help learners to develop their English skills in accordance with the unique characteristics of their work environment.

According to a survey of police officers working in well-known tourist areas in foreign countries, the most commonly used field in the use of English language is speaking and listening followed by reading and writing among the four categories. These results can be regarded as natural when we look at the priority of English usage situation for tourism police. The following is the priority ranking of work situation in which police officers need to use English in the tourist attractions areas[7][8].

1. Responding to foreign tourist's questions and problem solving.
2. Phone or face to face conversation.
3. Questioning& taking statements.
4. Giving directions.
5. Recovering lost and stolen goods.
6. Explaining emergency issues.
7. Dialogue on Historical/tourist sites.

Mutual communication between the tourist and police officers is quite important factor as it can be seen from above and the tourism officers also recognized as the most important element for acquiring job efficiency[9]. In result, when designing an English test or course, it must be focused on speaking and listening training among the four areas of English. Also, in an actual working environment of the tourism police, Officers are faced with the some difficulties such as fast speaking speed of foreign tourist, grammatical punctuation, lack of vocabulary, and opportunities of actual practice.

In general, tourism police work should be focused on the functional use of English because they are likely to use English for questions and answers or responding to help requests from foreign tourists. As a result, developing and designing a curriculum that fit the tourism police needs, a class or test that can reinforce the basic communication skills of English, should be emphasized[10][11].

3. Applying ESP in Course & Test

The role of tourism police is to protect tourists from crimes related to tourism and to minimize the inconvenience of tourists related activities and services[12].

Tourism police in Greece, famous for having many famous tourist destinations, are comprised of officers specifically trained in foreign languages. Their primary duty is to provide information to their citizens and foreign tourists, and to help them by solving tourism-related problems. Therefore, in case of tourism police, focusing on communication with the tourist in terms of providing tourist services and convenience, differentiating the duty regulation to better serve the foreign tourist. Looking at the ratio of foreign tourists who visit Korea, China is the largest and Japan is the second most. The proportion of tourists concentrated in some countries cannot be considered as a good phenomenon in the long term. Establishing a long-term plan to attract more diversified tourists from the all over the world is imperative. In order to communicate

with tourists from different nationalities, usage of the most universally used language, English, is critical. Thus, it is essential to find a way to improve the functional use ability of tourism officers which in result open the way for them to solve various inconveniences of foreign tourists and provide better services.

The most essential skills needed for tourism police, in the case of foreign tourist attractions, were functional use of language. Among them, speaking and listening ability were the most frequently used and to communicate with the tourist. Generally, officers used English to give directions, for problem solving such as question & response, recovering lost items, and giving a short explanation on tourist attractions which can all be regarded as everyday English. This means that English test, which is currently being implemented in Korea, is not appropriate enough to meet the needs for tourism police duties.

The police recruiting English test conducted in 2017 consists of 4 vocabulary questions, 5 grammar questions, and 10 reading questions summing up to total 20 questionnaires. Only 20 questions presented in the test are not sufficient enough to check the candidates' language fluency and furthermore, test items presented are also not in line with practical communication requirements that tourism police need to make mutual communication appropriately with the foreign tourist. There were only one case of a dialogue question directly related to practical communication and the questions related to vocabulary could only be solved if the candidates know the meaning of words that are far from common vocabulary used by tourists. In

addition, the grammar questions were too much focused on specialized property that would not cause problem in mutual communication even if the candidates don't know about the grammatical scope perfectly.

This kind of test question tendency is more centered on identifying candidates' ability to find the right answers rather than checking the fluency of the target language. <Table 3> shows the three questionnaires that were presented as vocabulary problems in police recruiting test. The only question that can be used by the tourism police officer in a work circumstance is the third one which is related with circumstantial communication environment. However, in the case of the vocabularies used in questions 1 and 2 for example, tattered/deject/opaque/sanguine are extraordinary vocabularies that do not correspond to basic vocabulary. It is very unlikely that these kinds of vocabularies having sophisticated meaning will be used by non-native speakers who are willing to use English to communicate in tourist attractions.

In order to verify the candidate's actual English fluency, it is necessary to replace the test method that can confirm the problem-solving ability based on the situation setting in actual work environment. The questions must be transformed into the kind that can verify officer's ability in problem-solving technic utilizing modified basic vocabulary needed in tourism settings. Therefore, in case of question 3 in <Table 3>, it is desirable to replace it with the type of question describing and explaining the situation by question and response. In addition, question No. 2 should be changed into the one that is appropriate for checking how the candidate describes and

•Table 3. Example test questionnaires from 2018 civil service examination.

1. What is the closest meaning to the underlined word? The woman was <u>convicted</u> and sentenced to ten years in prison for the murder case.
a. indisposed b. tattered c. condemned d. dejected
2. What is the closest meaning to the underlined word? The earthquake and the <u>subsequent</u> aftershocks frightened citizens.
a. opaque b. repellent c. sanguine d. ensuing
3. What is the appropriate word in the empty space? The truck went out of control and came close to _____ over a pedestrian.
a. running b. pulling c. taking d. looking

explains the situation of an earthquake then help tourists evacuate the area for avoiding the subsequent aftershocks.

In the case of reading comprehension, questions were presented to examine the candidate's reading ability using examples of science, social, cultural English paragraphs. The question itself doesn't seem to be a problem in checking the reading ability of the candidates. But it can't be considered as an effective questionnaire without considering the specificity of the tourism police. Tourism police should be able to explain the characteristics of the culture, historical sites or even the traffic situations and the best way to do so is to have a short conversation with the tourists. Therefore, it can be said that it is effective to use the examples that imply the regional characteristics, culture, sightseeing places, transfer, traffic or emergency situations, etc.

With the popularization and development of smart devices, the road guidance system for using public transportation or rental cars much easier without any help of anyone. However, there are occasions when a tourist needs assistance in the process of finding a specific destination using a tourist map around the tourist complex. If the tourism police help the tourist to figure out the difficulties in this kind of situation, it will not only give a good impression but also provide an opportunity to visit Korea again. In order to meet these conditions, the English skill which can explain the way of looking at the map and explaining the path to the destination is one of the essential elements that the tourism police should have. Thus, the kind of test items shown in <Figure 1> below should be added to verify such cap ability[13].

Figure 1. Test example of describing the location.



As such, it is necessary to cultivate abilities appropriate to the purpose of the tourism police by subdividing the English skills necessary for the needs of the officers. In order to achieve the above-mentioned object, the following procedure is required. First, English test and course design should be centered on core vocabulary that can be used by native and non-native speakers. Second, examples of reading comprehension should be used considering the characteristics of tourism in Korea. Finally, in the case of a dialogue questionnaire, the items should be focused on the actual working environment of the tourism police for verifying the target language fluency to cope with the circumstantial situation. Due to the linguistic nature of the individual, there are cases where communication difficulties arise in accordance with the different accent and intonation. So, basic training on unique intonation and accent is also needed to understand the tourists from non-English speaking countries.

4. Conclusion

This study focused on discussing the necessity of ESP and improving the English proficiency which can act as a cornerstone of the existence of tourism police. The first step for providing better services for foreign tourists through proper ESP education can be summarized as follows:

First, a survey of the basic vocabulary that is mainly used by foreign tourists should be conducted and applied to the tourism police English test and course design.

Second, the curriculum should be designed so that the tourism police can use the target language without difficulty in the actual work environment by organizing the content in details regarding road guide, tourist spots, and the historical sites where the officers operate.

Third, as not only native English speakers but non-natives use the language as a tool for mutual communication in various tourist attractions. English accent and intonation may differ in accordance with the tourist's cultures. So, the curriculum for tourism police should contain a pre-training course of diverse accent and intonation used in various cultures. If so, the satisfaction of service provision will be increased and the rate of re-visit will also increase.

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A Study on States of Secondary Victimization of and Measures against Dating VIOLENCE

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Abstract

The thesis recognizes and proposes an effective measures to prevent the recently occurring dating violence and their following secondary victimizations. Therefore, case analysis of dating violence and their following secondary victimization states as follows. First, by transition of recognitions on dating violence as crimes, reports by people should be activated and active intervention by judicial authorities should be enabled. Second, legislations should be amended to enable intensive penalties against assailants and to ensure personal protections. Third, by adopting One-Stop system, rapid handling of affairs and protection and support of victims should be enabled. Lastly, development and utilization of a crime-preventive smart-watch should be prepared to enable 24-hours protection of victims.

[Keywords] Dating Violence, Secondary Victimization, Recidivism, Case Analysis, Smart Watch

1. Introduction

In March 2018, in Busan, a dating violence, forcefully undressing and beating up a girlfriend who asked for a breakup, and hauling her to one's house to beat her up again, occurred, even threatening the victim constantly after he had been arrested by the police via threat messages et al[1]. It is the case, presenting a vicious cycle of dating violence which possesses a sufficient possibility of secondary victimization by an assailant. That is, even after an assailant of dating violence has just been released from imprisonment, the assailant may cause secondary victimization, generating serious damages to the victim through violent crimes including harassment, assaults and murder, as directly shown from the case.

Particularly, 'No Punishment Against Will' is applicable to assaults and threats that are mainly being applied to Korean dating violence cases, and these only involves 2 years or less imprisonment or 5 million won or less fine as there

is no 'Special Act for Dating Violence' in regulations. Moreover, due to the characteristics of relationships among lovers, most cases are ended up with oral agreements, then punishments to eradicate dating violence are not preliminarily practiced, thus, secondary victimization of such dating violence has a probability to be developed into more severe consequent by the assailants against victims.

Consequently, the thesis recognizes the seriousness of secondary victimization for dating violence and strives to search for preventive measures to minimize secondary victimization damages from dating violence by analyzing secondary victimization cases that had called huge attention of the public.

2. Related Works

2.1. Concept of dating violence

At the current state, the conceptual definition of dating violence is not clearly established. Only researches on dating violence incorporate violence among couples or loving relationships, and

designating it as love quarrels or violence[2]. Therefore, based on advanced researches, definitions of dating violence as follow in <Table 1>.

Table 1. Conceptual definition of dating violence.

Division	Main content
Sugrman & Hotaling (1989)	Often, dating violence, so-called as 'Courtship Abuses', refers to threats or violence against the other by a person during a dating relationship[3].
Stets (1992)	Dating violence refers to behaviors inducing physical harms against the other[4].
Ronfeldt & Kimerling & Arias (1998)	Dating violence refers to mental and physical behaviors to acquire control powers during a dating relationship[5].
Straus (2004)	Dating violence refers comprehensively to violence committed with intention to harm a person unilaterally against the other without any prior discussion among a single man and woman in a dating relationship[6].
Oh (2015)	Dating violence refers to behaviors that are judged to have intentions to potentially harm the other physically and mentally even if a single man and woman have no premise of marriage in their current dating relationship[7].

2.2. Cause of recidivism and secondary victimization pattern for dating violence

The biggest cause of dating violence recidivism is that dating violence is still being treated as a private issue to be resolved among couples, thus, only colleagues or friends are called for help in most cases rather than practical reports or calls to the public supportive systems such as police department and professional treatment agencies, et al.

Furthermore, as punishment regulations against present assailants and the level of personal protection for victims after dating violence are too weak or insufficient, no active measures by judicial institutions are executed, thus such conditions lead to a secondary victimization of dating violence by the assailants.

As a result, recognizing the cause of dating violence recidivism as a private issue leads to passive protection measures to victims of dating violence and its pertinent weak punishment regulations, hence, develops into serious secondary victimization damages by the assailants.

Dating Violence damage patterns are largely categorized into the first and the secondary patterns, and as follow in <Table 2>.

Table 2. Dating violence damage pattern.

Division	Main content
First pattern	Physical, mental, verbal and sexual violence[7].
Secondary pattern	- Secondary victimization due to the result of criminal procedures by judicial institutions - Secondary victimization deriving from investigative procedures by investigative agencies - Secondary victimization deriving from recidivism by assailants who returns to the society without fully being corrected and treated since the event occurrence[8].

3. Analysis of Dating Violence State and its Secondary Victimization

3.1. State analysis of dating violence and

its secondary victimization

3.1.1. Present condition analysis of dating violence

For the past 5 years(2012-2016), according to the official statistics data from the National Police Agency, frequency of dating violence occurrence has constantly increased since 2014, and the number, 7,584 cases, in 2012 increased to 8,367 cases in 2016 by 10% for the years, as depicted in <Table 3>. Furthermore, the most frequently occurring dating violence pattern is assaults and injuries, taking 1.5% of the whole, however, considering that lives are deadly jeopardized, such crimes should be taken into consideration with higher degree of severity than other crime patterns when they occur[9].

Hence, the majority of assaults and injuries are involved in first victimization damages occurring during dating violence, while their secondary victimization may lead to murders – considering such conditions, preliminary preventive measures for victims and early-stage responses against dating violence occurrences are urgently needed.

Table3. Yearly condition of dating violence(2012-2016).

Year	Assault	Injury	Special Violence	Sexual Violence	Murder	Total
2012	2,822	3,028	1,226	409	99	7,584
2013	2,848	2,571	1,179	533	106	7,237
2014	2,702	2,273	1,109	483	108	6,675
2015	3,670	2,306	1,105	509	102	7,692
2016	6,233		1,017	224	52 (Others 841)	8,367

3.1.2. Present condition analysis of secondary victimization of dating violence

In accordance with the investigation on ‘Conditions of Dating Violence and their Measures’ by Police Science Institute, the average recidivism rate of assault-assailants among couples from 2005 to 2014 was reported as 76.5% and its interval as 6 months since the previous commitments. Also, observing the assailants by ages, 20~30 took 58.3% and 5,213(62.3%) of them were identified as the ones who experienced violent acts against their lovers[10]. In fact, since that dating violence is generally occurred among

close loving relationships should be significantly considered, if no preliminary protective measures for victims and isolation of assailants away from the victims are not properly executed, vicious cycles of secondary victimization by the assailants will continue.

3.2. Case analysis of secondary victimization for dating violence

Division	Contents of secondary victimizations and their analysis
Case 1	After the assailant(A) is released from imprisonment, constant calls and messages of threats were sent to the victim, further, spread false information of the victim, insisting the victim had a sexual relationship with the assailant-self via SNS to the colleagues of the victim at work – thereby, a second victimization of dating violence had occurred in the case[11]
Case 2	Consistent stalking and threats by the assailant(K) had led to a murder with deadly weapons against the victim, the teacher(A) in the case[12]
Case 3	- The victim(D) reported the dating violence to an investigative agency, however, the agency merely treated the case as a trivial private issue with no active measures, then consequently the victim was more harshly or violently beaten up by the assailant(R) in the case[13] - The victim was treated as a female who violates the confidence of men with sex appeal rather than a victim, even though the victim reported to the police in the case[13]
Case 4	- As a case of dating violence occurred in Busan, the boyfriend committed dating violence and threatening calls and messages succeedingly, thus, had put the victim suffer from psychological anxiety and stress intensely till the victim cannot maintain her everyday life. Further, the assailant had shown a sign of second victimization in the case[14]

<Case 1>, <Case 2>, <Case 4> are the result pattern of secondary victimization by assailants developed from the previous commitments due to reasons of obsession, revenge and hatred that links to more serious consequences. Especially, as in the case of <Case 4>, most of the victims of first victimization from dating violence are not able to maintain their everyday lives due to anxiety and stress of being involved in secondary victimizations, and in fact, as observable in <Case 2>, secondary victimizations are found to

be more dangerous than the other as the secondary victimizations had led victims to even deaths.

Furthermore, <Case 3> is the crime victim case of secondary victimization occurring from the procedures and measures of judicial institutions against the first victimizations. Even though victims should be successfully isolated from the assailants and practice personal protection for the victims, when dating violence has been reported, due to passive and insufficient management to the victims, the secondary victimization crimes occurred. Above all, even if the judicial authorities are the ones which must recognize the dating violence as the incidents which the authorities should actively intervene in, not as private issues, unfortunately, they are not perceiving them as important crime issues, but merely trivial.

In the manner of the real responsive management against dating violence by the police, 53.3%, which is the highest among all options, of the public insisted that the police 'treated dating violence as a mere trifle', thus, proved, the recognition state of the police regarding dating violence has influenced the level of case investigation and enforcement procedures[15].

As described from the above case analysis, secondary victimization damages after the first dating violence can lead to serious crimes that may put the victims into deaths. Thus, dating violence should be recognized as issues that the government should actively intervene in, and establish strict punishment systems against assailants and personal protection system for victims via legislative modifications.

4. Prevention of and Measures against Secondary Victimization of Dating Violence

This chapter would like to propose a responsive measure against dating violence and following secondary victimizations by analyzing real cases as follow.

First, transition of recognition, from a private issue to a significant problem that a government should actively intervene in, is needed. That is,

not only the victims, but also the judicial authorities should perceive dating violence as social crimes, and in a personal dimension, a person should actively report to the judicial authorities for help, then the authorities including the police should be able to conduct an active early-responses.

Second, legislative and institutional measures to protect victims from dating violence, and to punish against assailants, should be established. With the current state of law, the legal basis to punish assailants is insufficient as there is no rule of 'Right of Request Prohibition of Access' or 'Right to Victim Statement of Opinion'. Therefore, the police are not able to perform particular measures even if they are mobilized. Consequently, punishment legislations against assailants should strongly be intensified and legal means to actively respond to violence should be developed so that the police can control the violent behaviors of assailants, when victims report to the police.

Third, by adopting One-Stop system, when dating violence occur, related institutions should rapidly be associated and linked to solve the cases, as domestic violence is dealt with. Considering that dating violence has identical features – consistency, recidivism and vindictiveness – like domestic violence, supports to victims and rapid resolution of crime cases would be the most important matters. Therefore, to prevent secondary victimization of dating violence, establishment of an associated network or system with authorities to perform One-Stop measure, from incident reports to supports to victims, would be required.

Finally, to minimize any damage from secondary victimization since dating violence, utilization of intelligent smart watches would be required as an option. The current smart watches offered by the National Police is operated by pressing an emergency button to mobilize the police when an emergent situation occurs to victims. However, there are problems – countermeasures are performed after crime occurs, and locational identification of victims is not accurate, but takes long time. Therefore, under the circumstances when judicial authorities such as the police cannot monitor assailants or protect victims for 24hours, utilizing intelligent smart

watches, developed from the existing models, that can preliminarily prevent crimes in advance, would be the way to minimize damages from second victimization of dating violence.

5. Conclusion

Recently, societies have recognized the severity of dating violence, and have proposed various legislations and countermeasures to prevent it. Despite such efforts, dating violence frequency has been constantly increasing, and their secondary victimization is becoming even more serious crimes, in fact. As if such realities are being reflected, the recidivism rate of dating violence has reached 76.5% for the past 10 years(2004-2015), but its imprisonment ratio only reached about 5% out of the numbers of dating violence in 2016.

Hence, local communities and governments should no longer consider dating violence and its secondary victimization as private issues, but social issues, so that they would actively respond to the issues, preventing recidivism of secondary victimization cases.

As a result, this research investigated official statistical data and the media cases and strived to seek for effective countermeasures against second victimizations of previous dating violence by analyzing their conditions and real cases.

Thanks to such efforts, it has been discovered that transition of recognition of second victimization of previous dating violence into crimes is needed, and proper legislations to bring constant supports to victims and strict punishments against assailants should be amended. Moreover, to enable protection of victims from assailants and One-Stop system for rapid affair managements, intelligent crime-preventive smart watches should be developed and designed for their applications.

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A Study on the Integrity Assurance of CRIME Digital Evidence

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Abstract

With advances in digital technologies, vast quantities of information have been processed and reported in a digital form. This has resulted in an increase in the scale and number of crimes related to digital information, and the relative importance of digital evidence in criminal proceedings has also increased significantly. In addition, it is a reality that such a huge amount of evidence is confiscated in a digital form at the crime scene and submitted to the court, but digital evidence is still not recognized as satisfactory proof due to its characteristics as well as insufficient legal and institutional support. Likewise, although the importance of digital evidence continues to increase, there is still a lack of research on the technologies and procedures to ensure integrity, such as the prevention of forgery and tampering with acquired digital evidence.

Since digital evidence is easily altered, tampered with or destroyed through improper handling, it has been faced with a challenge of securing the reliability of investigation and ensuring its integrity. Therefore, it is required to devise measures to ensure the integrity of digital evidence so that digital evidence can be accepted as legally valid in court. In this regard, this study proposed a method to guarantee the integrity of digital evidence by using blockchain technology that allows all nodes in the network to share distributed database securely without the use of a central server, and thus can prevent the forgery and tampering with data. The use of this method is expected to reduce the time and cost burden, while ensuring a high level of integrity.

[Keywords] Policing, Digital Evidence, Integrity, Blockchain, Crime

1. Introduction

In recent years, the rapid development of information and communication technologies has led to the digitalization of information at an accelerating rate, and thus the scale and frequency rate of crimes related to digital information has increased accordingly. As digital forensics become common in cybercrime investigations, an interest in digital evidence is also increasing, and electronic evidence confiscated in a digital form at the crime scene is increasingly presented as important evidence at a trial.

Digital evidence is probative information that is stored or transmitted in a digital form. Therefore, digital information plays a very important role in identifying allegations of all crimes, and its importance will further increase in the future.

Digital evidence, however, has not yet been recognized as satisfactory proof in the court due to its characteristics as electronic evidence which is fragile and can be easily deleted, tampered with or destroyed unlike physical evidence. Accordingly, there is a need for a method that can ensure the integrity of digital evidence which is admissible in court.

This study seeks to investigate blockchain technology that can prevent the forgery and tempering with data in a way that generates a block in which information on all of the transactions that occur within a certain period of time is recorded, transmits the generated block to all computers connected to the blockchain network instead of a central server and shares it with them, and to propose a method to guarantee the integrity of digital evidence.

2. Related Studies

2.1. Digital evidence

As shown in the following The precise conceptualization of digital evidence is not yet complete, but it refers to information reliable enough to stand up as evidence in court that is either stored in a computer or on digital storage media, or transmitted over a network[1]. In other words, digital evidence is information that is either stored in a computer or on digital storage media, or transmitted over a network, and it is evidence that is necessary for criminal investigations and prosecutions[2].

Unlike general physical evidence, digital evidence is characterized by non-visibility/non-readability, vulnerability(possibility of forgery)/ease of duplication(media independence), mass quantities, expertise, volatility and transnationality. Digital evidence has characteristics that distinguish it from traditional physical evidence. Digital evidence includes six main characteristics[3].

1)Media independence: The independence of media in digital evidence means that the content of the original does not change even if it is transferred from one digital storage medium to another one, the value of the content is not changed although the identity of the entity is transferred to any digital storage medium unless the content stored in the original of digital evidence is transmitted or stored after being manipulated or altered, and the identity of digital evidence can thus be recognized.

2)Non-visibility/non-readability: It is evidence made of non-visible forms of 0 and 1, which are not visible to the naked eye.

3)Vulnerability(possibility of forgery): It is easily damaged, deleted and forged by mistake or on purpose, and it is difficult to find the deletion and forgery. Ease of duplication(media independence): It is easy to create the duplicate that is the same as the original, which is difficult to distinguish.

4)Mass quantities: When a large-scale server system or a file server is the subject of investigation, the amount of data to be collected and analyzed is enormous.

5)Expertise: The collection and analysis of digital evidence requires professional skills and needs a forensics expert.

6)Transnationality(network association): In the current digital environment, digital evidence is being transmitted across the walls of a space because each computer is connected to one another through various networks including Internet rather than being isolated As a result, there are characteristics regarding the extent to which the law enforcement over domestic jurisdictions is recognized and the issue related to sovereignty when crossing national borders[3][4].

As such, it is often difficult to apply the conventional process of collecting and analyzing traditional evidence to digital evidence due to the above characteristics[5].

2.2. Digital evidence considerations

Digital evidence with characteristics distinct from those of physical evidence can be used as evidence in criminal proceedings only if it meets the requirements of authenticity and integrity as evidence. In this case, the authenticity of digital evidence is in the same vein as the formal and practical authenticity of physical evidence. The integrity of digital evidence should be preserved so that there can be no improper alternation, modification and damage of digital evidence in the process of being collected from the original, stored and analyzed, and this should be verifiable[6]. In order to use digital evidence in a criminal action, special precautions need to be taken from the generation of the original by the actor to the collection and analysis during the investigation process as well as the presentation of evidence in court. Therefore, the probative value of digital evidence cannot be recognized unless technical issues such as authenticity and integrity are resolved[7].

2.3. Blockchain

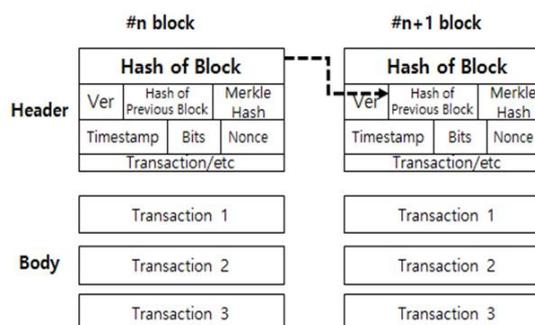
Blockchain is a P2P(Peer to Peer) distributed ledger technology, which distributes and shares transaction details to and with all participants in a blockchain network, rather than managing them in a centralized server. As participants manage the transaction details distributed to the P2P network, participants in the network can jointly record and manage them, and they can verify the forgery and falsification of transaction

details through the chain of blocks. Users(nodes) participating in the Bitcoin blockchain create transactions and sign the transactions with their private keys[9]. The created transactions are broadcasted and transmitted to other users, and the transactions are generated as one block through a specific agreement algorithm in the settlement process. The generated block is connected to the existing blockchain, and the information of the block is broadcasted to other users. The users can confirm the integrity and reliability of data between users without the use of a central system based on the information of the blocks connected to the blockchain. The blockchain uses hash functions and data chaining techniques to provide data integrity. It also uses public key-based digital signatures to ensure the reliability of data[11].

The block of blockchain consists of a header and a body. The body of the block is composed of transactions, and the block header is composed of the block's own hash, the hash of the previous block, a Merkle tree and timestamp. With respect to the transactions of the block registered in the blockchain network, the data cannot be forged and modulated due to the hash of the previous block contained in the block header. The block structure of the blockchain is shown in Figure 1[10].

The blockchain uses a P2P network in which each peer participating in the network must replicate the same file, and new data is propagated and verified through the network. However, it takes a long time and costs a lot of money to propagate and verify the data through the P2P network. Therefore, a larger data structure can be checked safely and efficiently by allowing the Merkle tree to transmit only the hash value of data instead of sending the data and the receiving peer to check the hash value of the root hash of the Merkle tree. In addition, the integrity of data is also ensured. The Merkle tree, also called a hash tree, is organized in the form of a binary tree, and all peers/nodes must have the same legitimate and unaltered data which is not damaged. If the data is changed in one node, all nodes participating in the blockchain network must be informed of the change[8].

Figure 1. Blockchain block structure.



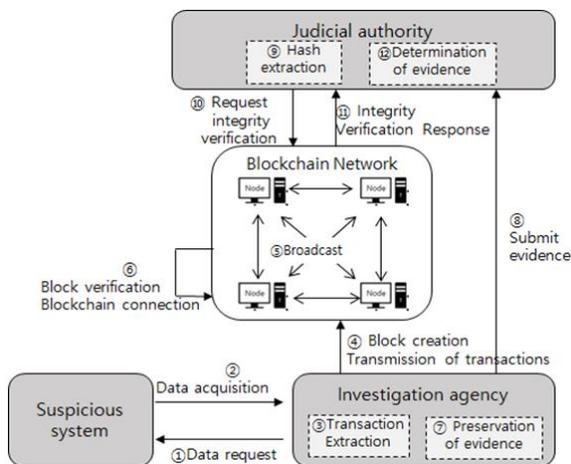
The blockchain work flow has five steps which include transaction definition, transaction authentication, block creation, block validation and block[10]. Transaction definition is the model of the transaction pre-defined by the blockchain network, and the sender's digital signatures, the transaction payload and receiver's public key are cryptographically signed with the sender's digital key. Transaction authentication is the process by which the nodes validate if the user A has the asset, enough balance to send the asset and is authenticated to move the asset. Block creation is the process of creating blocks by node from the transaction pool where transactions are grouped together based on the creation time. Block validation is the process of validating the blocks by checking if there is previous hash and nonce which provides the proof-of-work. Block chaining is the process of adding the blocks to the blockchain once the nodes reach a consensus[12].

3. Proposed System

This chapter presents a way to prevent the integrity of digital evidence from being damaged in the investigation process and proposes a method based on the blockchain technology that can detect the forgery and falsification of digital evidence through distributed blockchain nodes without the operation of the central authentication system. The proposed framework operates through a connection with the blockchain network that stores authentication and integrity verification information. The organization of each institution can be divided into the suspicious system to be investigated, the investigation agency that conducts investigations and collects actual evidence, the enforcement authority that exercises the powers of jurisdiction

and the blockchain network that provides integrity. The composition of each institution and the procedure of the system are shown in <Figure 2>.

Figure 2. Proposed system.



The prevention of damage to the integrity of digital evidence is achieved through the blockchain network. The investigation agency with a seizure and search warrant collects information about the suspicious system, when the investigation agency broadcasts the collected evidence information to the blockchain network, thereby ensuring both the transparency of the investigation and the integrity of the digital evidence.

The blockchain creates blocks in which all transaction information generated during a certain period of time is stored and propagates the created blocks to members' computers connected to the network rather than to the central server, which makes it practically impossible to forge and alter the data.

The investigation agency extracts the transaction of evidence information and make a request for transactions such as the submission of the evidence information to the enforcement authority. The block is propagated through the steps of transaction definition, transaction authentication, block creation, block validation and block chaining to setup the blockchain. The investigation agency submits the evidence, and the enforcement authority requests the blockchain network to verify integrity and adopts the evidence if the integrity is verified.

The framework for ensuring the integrity of digital evidence proposed in this paper is com-

posed of key generation and distribution, evidence collection, evidence registration and evidence adoption decision procedures, and the symbols and notations used are shown in <Table 1>.

Table 1. Notation.

Notation	Description
IA	Investigative agency
JA	Judicial authority
ID_{IA}	Investigative agency(Investigator) ID
CN	Case number
TS	Target(suspicious) system
SI	Suspicious system information
DI	Digital evidence profile
TS	Time stamp
PI	Digital evidence profile
H()	Hash

1)Key generation step

For private key generation, a random number generator is used to generate pairs of 256 random numbers. The each random value becomes the user's private key and has a length of 256 bits per key. The user obtains the hash value of the user's private key to make a public key. The hash values of 512 generated by the hash function become the user's public key.

2)Evidence collection step

The investigation agency confiscates a digital data source which is suspected of being involved in a criminal offense from the suspicious system, when an investigator should use a certified forensics tool as shown in the process of ①~③ in <Figure 2>.

Using the forensics tool, the investigator analyzes digital data involved in the suspicious system and collects digital evidence. In order to guarantee the integrity of the digital evidence, he or she generates an identifier, extracts the system information, creates the profile of digital evidence to which the collected identifier is applied, and uses it as a transaction of the digital evidence.

First, the transaction for the extracted evidence is defined. The definition of a transaction is the transaction model pre-defined by the

blockchain network, and the sender's digital signatures, transaction payload and receiver's public key are encrypted with the sender's digital key.

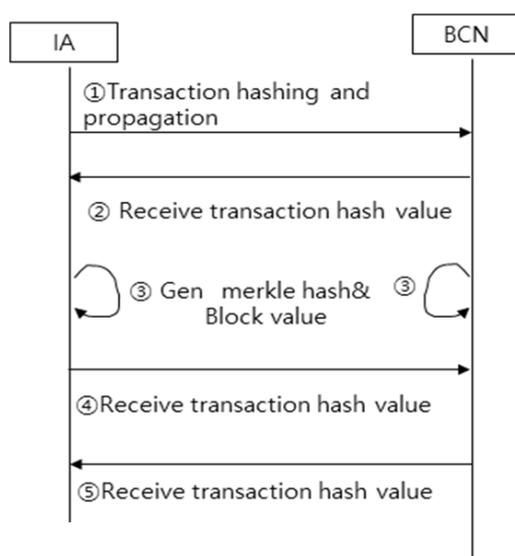
The investigator logs onto the suspicious system(TS) through a forensic program and collects system information(SI), when the collected information uses H/W and S/W eigenvalues that can identify the suspicious system. The investigator then uses the SI to generate case number(CN). He or she also generates Timestamp used as the digital evidence collection point and the standard time of the current forensics system.

The investigator collects the digital data from the TS and generates the DI. Then, he or she creates the PI using the collected DI and the stored CN and uses the SHA-256 hash algorithm to create a hash value, when the PI records the profile information of the digital evidence.

3)Evidence information registration step

The step of evidence information registration corresponds to the process of ④~⑥ in <Figure 2>. In this process, the transaction for the extracted evidence information is propagated, verified and added to the blockchain <Figure 3> shows the procedure for this step.

Figure 3. Evidence information registration step.



- The investigation agency transmit the transaction extracted from the digital evidence in the previous step to each node connected to the blockchain network.

- The transaction is broadcasted to blockchain network.

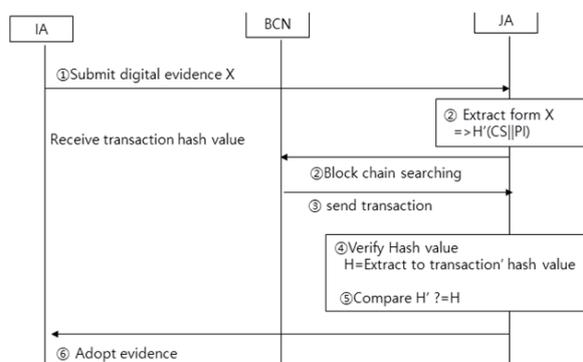
- The nodes of the blockchain network receive the transaction value of evidence in formation.

- The nodes generate the root hash value by creating the Merkle tree with the hash value of the transmitted transaction. The completed hash value is used in the header for block creation. The block is created by performing the proof-of-work until the desired range of hash values is obtained using the SHA-256 hash algorithm.

- If the node completes the block creation first, it informs the other node that the block creation is completed. If another node completes the block creation first, it receives nonce and timestamp value when the block is generated from another node.

- Each node verifies the hash value of the block by using nonce and timestamp value received from the node that generated the first block. If the first generated block is not a normal block, it is not registered. In this case, the block creation is performed again.

Figure 4. Evidence adoption decision step.



- If the validation is successful, pending transactions in the transaction pool are grouped together, and blocks are created, propagated to other nodes, and added to the blockchain for storage and management.

4)Evidence adoption decision step

The process of ⑦~⑫ in <Figure 2> is the step to decide whether to adopt the evidence submitted by the investigation agency. The investigation agency stores the transaction of the evidence information in the blockchain and then submits the evidence to the Judicial authority.

The Judicial authority extracts the hash value H' from the evidence submitted by the investigation agency and requests the blockchain network to verify the integrity. The node of the blockchain network retrieves the block in the blockchain and then extracts hash value H from the transaction. Later, the two values are compared and verified to confirm the integrity of the submitted digital information. If the verification is successful, the evidence submitted by the investigation agency is adopted, and if the verification fails, the integrity of digital evidence can be considered to be damaged. <Figure 4> shows the procedure for this step.

4. Evaluation of the Proposed System

The proposed system using blockchain has characteristics that propagate data such as the transaction value of digital evidence to all nodes connected to the blockchain network for storing and sharing them and thus prevents the forgery and falsification of the data. This gives a high degree of credibility to the proposed system. In addition, the proposed technique can reduce the risk of system hacking or server operating costs because it requires no separate central server, unlike the conventional public key-based method which stores all data in the authentication system. In addition, it is possible to prevent the denial of nodes that register evidence information due to the characteristics of blockchain. In the previous systems, one hash value is used to prove one original data. However, in the proposed blockchain-based system, as authentication is done through a hash value corresponding to a plurality of hash values, not a one-to-one correspondence, security for digital evidence verification can be improved.

5. Conclusion

With the advent of the Fourth Industrial Revolution, the use of digital devices is further increased, and the phenomenon of information digitalization is being intensified. In addition, the amount of evidence confiscated in a digital form at the crime scene is increasing dramatically, and digital evidence is becoming a very important key to proving criminal allegations.

In this regard, this study proposed a method to ensure the integrity of digital evidence without the intervention of a central authentication server by using blockchain. The blockchain is a technology that creates a block that records all transactions that occur during a certain period of time, propagates the created block to all computers connected to the blockchain network instead of the central server, and thus can prevent the forgery and falsification of data. Therefore, the proposed technique using the blockchain guarantees a relatively higher level of performance compared to the previous techniques in terms of the possibility of hash value forgery and falsification of digital evidence, system hacking risk, operating costs and credibility. Therefore, it is expected that the use of the proposed technique can further strengthen the integrity of digital evidence, and digital evidence obtained through the improved procedures will bring about positive results in terms of integrity assurance, and the reliability and cost of investigation. In addition, the court is expected to make a more fair judgment through the digital evidence obtained in this way.

For the future research, there is a need to develop more practical systems that can verify the effectiveness of technical aspects through practical cases and allow investigators to use them with ease, and to outline the detailed directions of supporting policies.

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A Study on STALKING Preventive System

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Abstract

Stalking is a behavior tailing another constantly and repeatedly due to mere unilateral favor to the one even if it is opposed. Victims and assailants of stalking are mostly 'acquaintances', particularly ex-dating partners. Victims tend to passively respond to the constant harassment by assailants without informing outside due to own guilty of close ex-relationship, resulting in being victims of violent crimes, including rape, assault and murder. Furthermore, stalking is legally regulated only when it has been constantly committed, was felt as terrifying action, was overtly rejected and was committed with an intention. Thus, such behaviors by assailants with no legal qualification fulfillment are not regulated by law. The thesis would like to identify the notion, features, development condition and punishment upon stalking and to propose a preventive system against it.

[Keywords] *Stalking, The Minor Offenses Act, Constant Harassment, Characteristics of Stalking, Punishment for Stalking Act*

1. Introduction

Stalking is considered as a mere notion of privacy infringement of celebrities by several fans with mental disorder, however, as it has been initiated to be known as violent crimes due to grudge of being rejected to date with among couples, attention to stalking is increasing[1].

90% of victims and assailants of stalking are 'acquaintances' and 58% of them are ex-couples. Due to the guilt of close ex-relationship, victims hesitate to inform outside of that ex-partner is stalking, hence, assailants end up harassing the victims constantly taking advantage of the information that they had gained before.

Stalking is only recognized when it has been constantly and repeatedly committed against overt intention of victims to reject. Generally, offline stalking is punished under 'the Minor Offenses Act' and online stalking is punished under 'the Use of Information Network System and

Protection of Information Act'. However, violence, harassment, threat and defamation et al. during stalking process is punished under a charge of threat, defamation and housebreaking et al., thus it is difficult to find stalking assailants being punished just for stalking commitment, in fact.

The thesis proposes a preventive system against stalking that enables victims report stalking affairs to investigative agencies via a device without letting outsiders know them, when constant harassment, stalking, not to mention, and even crimes that do not fulfil stalking qualifications are committed against victims' intention opposed to the assailants. The proposing stalking-preventive system can allow victims to obtain systematic supports and phased protection measures by the police based on the reported affair details and to prevent further recidivism in a form of revenge by assailants and development into violent crimes.

The chapter structure as follows. Chapter 2 illustrates the notion, characteristics, development condition and punishment upon stalking commitment and chapter 3 suggests a preventive system against stalking. Considerations regarding the system and conclusion are illustrated in chapter 4 and 5.

2. Related Research

2.1. Notion and characteristics of stalking

According to the Polizeiwissenschaft dictionary, stalking is “one of the recently emerging crimes and refers to behaviors following after another till the one being chased feel the fear of life or assault. It may be a violence type that does not involve any direct contact[2].

Stalking is a crime involving unilateral action by means of phone-call violence, constant tail, waiting in daily-life surroundings, lech and shower of presents. Survey result from 1700 stalking victims is disclosed during a seminar to prevent power-related sexual harassment. Based on the result, stalking affairs is largely divided into 7 and the most frequent type was ‘Unwanted Phone-call(74%, incl. Medium-Width). ‘Tail’(70%, ‘Visiting house’(65%), ‘Spreading Rumor about Victims’(63%), ‘Suicide Threat’(62%) and ‘Unwanted Letter or Writing’(62%) in descending order[3].

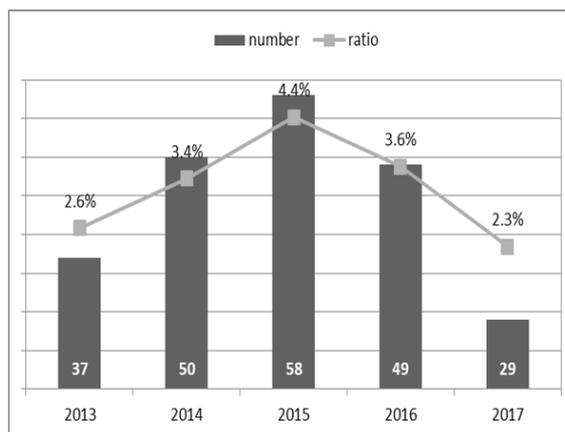
As Info-communication technology is developed at recent times, a new stalking form, ‘cyber-stalking’ appeared. Cyber-stalking refers to constant and repetitive harassment via phone-calls, e-mail, internet board and chatting room et al., by using marks, letters, sounds, videos and images. Cyber-stalking can occur ubiquitously, enabled any random 3rd party to harass and threaten others, reduced risk of direct face and can spread over random multiple people, thus is different from any other form of offline stalking commitment[4].

2.2. Stalking occurrence status

No consistent investigation on stalking occurring by year is not performed in Korea, however, its number can be estimated based on the number of sexual violence victim counselling registered in Korea Sexual Violence Relief Center. As

depicted in <Figure 1>, although stalking rate does not take the largest proportion among all sexual crime cases, it is not socially accepted as a clear violence, thus it is highly likely that victims are not able to get help or ask for help leading to constant damage[4].

Figure 1. Stalking rate among sexual crime types.

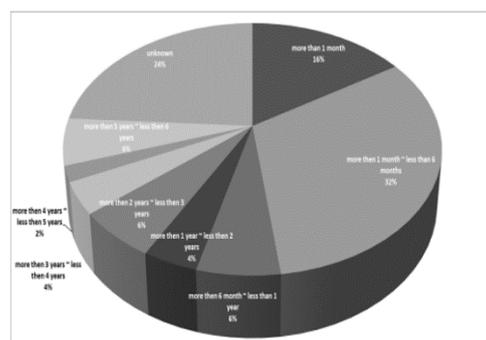


2.3. Stalking-related punishment

According to the Minor Offenses Act, those who commit constant harassment, that is, visit or dating request, watching, following and stake-out via consistent approaches to victims can be punished[5].

However, ‘constant harassment’ of the Minor Offenses Act imposes maximum 100 thousand won fine or confinement et al., for stalking, hence repetitive and constant mental and psychological damages are caused, furthermore, if it is not resisted at an early stage, it may develop into violent crimes, such as assault, kidnapping and murder. Thus, there are practical limitations to deal with stalking, and effective measures to protect victims are asked for preparation.

Figure 2. Stalking duration.



3. Stalking Preventive System

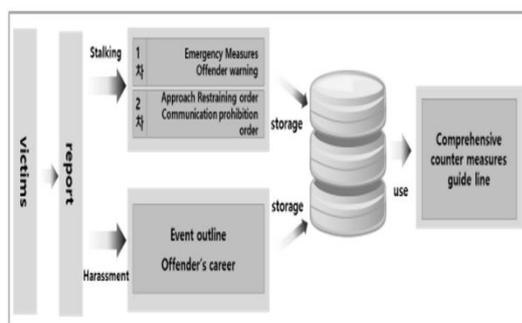
Based on the current law, stalking is defined as, 1. Certain behavior is repeated for a significant period, 2. The other felt fear and terror due to the act, 3. Clearly opposed to the other's will, and 4. Specific intention is implied in the behavior.

Primarily, offline stalking is regulated by 'the Minor Offenses Act' and online stalking is regulated by 'the Use of Information Network System and Protection of Information Act'. However, punishing against stalking with such legislations is merely limited to general stalking, and assault, harassment, threat and defamation originating from stalking procedures are just dealt with a charge of threat, defamation and housebreaking et al., therefore it is difficult to find stalking assailants being punished only for stalking commitment[6].

The thesis proposes a preventive system against stalking that enables victims to directly report to the police, prevent additional damages in advance and support victims with appropriate countermeasures against stalking by assailants who abuse victims' information, upon behaviors that are fixed as stalking such as unilateral and constant contact, sudden visit to residence or workplace and privacy infringement including personal information leakage and even light commitments, if they are opposed to the will of a victim.

The preventive system being proposed against stalking consists of 3 distinct functions as <Figure3> depicts, reporting to investigative agencies online via smart-devices.

Figure 3. Stalking preventive system.



1. Report and Processes Stalking

When victims report investigative agencies about their stalking damage cases(date, time, place, dialogue, letter and phone-call et al.), the data(personal details of victims and assailants, harmful acts of assailants and damage degree of victims) is recorded in DB. Investigative agencies analyzes the damage information and judge whether to perform mobilization. Then, the mobilized police perform an expediency such as separating victims and assailants, and warn assailants. If, recidivism of stalking is recognized, measures of approach-or-communication prohibition are practiced. Despite such prohibitions, if stalking recidivism occurs, criminal punishment is applied to the assailants and the data stored in DB is utilized for evidences of the criminal punishment.

2. Report of Harassment Undefined as Stalking, but against Victims' Will and Following Procedures

If a harassment is not definable as stalking despite disagreement with victims' will, victims constantly record its details(date, time, place, harassment type) and personal data of assailants and themselves in DB of investigative agencies. At this point, any request – police intervention and online or offline warning letter to assailants – is recorded together in the DB. When the harassment fulfills stalking qualifications through consistency, it is dealt as a stalking crime case.

3. Integrated Countermeasures against Stalking and Supports for Victims

Analyzing the stored stalking data(victim and assailant types, crime type and damage degree et al.) in DB of investigative agencies, the data is used as a legal basis – establishing a case processes standard, reinforcing punishment against assailants and legislating protective laws for victims.

4. Considerations of Proposing System

Stalking victims tend to hide the affair inside privately due to various reasons – 1. Fear of getting disadvantages when their stalking state is disclosed from societies or family, 2. Anxiety that other people would suffer from the assailants or to stimulate them, 3. Sense of Guilt that oneself

attributes to the stalking since it is by an assailant, an acquaintance, 4. Resignation owing to fear and guilty conscience towards the assailants[7]. Therefore, discovering stalking at an early stage is difficult, preventing it from developing into violent crimes fails, and preparing protective and supportive measures is difficult.

The preventive system being proposed in the thesis enabled rapid responses against assailants, active initial countermeasures by the police by allowing stalking victims to inform investigative agencies of the damaged facts and assailant details via smart-devices without letting outsiders know it[8]. Furthermore, constant record and management of stalking prevented assaults and threats from occurrence and allowed its uses as a basis for criminal charges. Even if a harassment is not defined as stalking, as it opposes victims' will, by letting it be recorded continuously, its utilization for any report and investigation against stalking and prevention of its development to stalking have been enabled.

5. Conclusion

Stalking refers to constant behaviors harassing another by phone-call violence, consistent tail, waiting in daily life surroundings, lech, hugging and shower of presents. However, stalking victims mostly end up being victims of violent crimes including rape, assault and murder as they merely conduct passive response, bearing violence by assailants and not informing outsiders of their damaged condition due to their sense of guilt, originating from their close ex-relationship.

Currently, stalking is punished under the Acts of Minor Offenses and Use of Information Network System and Protection of Information, however, there is a limitation to deal with stalking crimes with such laws as stalking is highly likely to result in serious criminal offense such as murder, and effective tools to protect the stalking victims are not sufficient. Moreover, legal grounds such as criminal definition and punishment criteria are insufficient, hence following penalties are light, as harmful behaviors by assailants are not visible, field measures to protect victims are limited – thus, considering the nature

of 'constant harassment' taking an advantage of victims' information acquired from previous 'acquaintance relationship', the punishment level is insufficient.

The preventive system against stalking being suggested in the thesis enables victims to report their damaged condition from stalking with evidences to investigative agencies without exposing their identity via smart-devices, eventually prevented its development into violent crimes by initial measures by the police and rapid responses against assailants. In addition, though a harassment is not punishable on charge of stalking, by continuous record of the disagreed behaviors with victims' will, identification of encountered situation of victims and storing assailant personal details in prior, its development into stalking is preliminarily prevented. Further, analyzing a set of data about stalking stored in the preventive system has a case procedure standard be prepared, finally allowed a legal basis, such as 1. Reinforcing punishment against stalking, 2. Reinforcing field responsiveness of the police and 3. Systematic supports – counseling, treating and protecting – for victims have become available for preparation, be prepared.

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POLICING against and Characteristic of KOREAN Organize Crime: Using Big Data

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Abstract

This study is to analyze the characteristic of the Korean organized crime based on the general characteristic theory of organized crime. This study employs social network analysis to confirm what the characteristics of the Korean organized crime are and how they are linked with in personal, structural, and influential network. The study uses big data related to organized crime that can give implications to us to identify or understand the characteristic of organized crime in Korea. The research uses Web crawler on R project to collect texts related to organized crime from 1990 and 2018 on social media like major newspapers in Korea. This study collects 59,421 words by using Web crawler, but the raw data cannot be analyzed because of unstructured text. The study employs text mining to process natural language and morphological analysis to extract adjectives and nouns. 54,759 are processed as natural languages and then 51,356 are extracted as meaningful and appropriate words for our research by using stemming analysis. The findings of the research illustrate that it is possible to present major characteristics of organized crime in Korea as follows: rational profit through crime, use of force or threat, organized hierarchy continuing, restricted membership, and oversea activity and refuge. These are similar to the characteristics of foreign organized crime, but there are significant differences in size and operation. Although it is hard to compare to the size and operation of Mafia, Triads, and Yakuza, the Korean organized crime apparently has organizational structure, activity, and power like an international organized crime. It is important to be recognized that the Korean organized crime has the potential possibility for developing into an international organized crime.

[Keywords] Policing, Characteristic of Organized Crime, Korea, Big Data, Illegal Business

1. Introduction

It is tough to go a few months without seeing the impacts of criminal activity by organized crime on social systems especially on the economy and security. Organized crime has been expanding its power to gain money and profit from illegal activity. Due to this, organized crime is more likely to extend organizational size and active domain and to engage in more illegal activity.

Organized crime like the Russian Mafia, the Chinese Mafia, Hong Kong Triads, and the Japanese Yakuza is a category of transnational,

national, or local groupings of highly centralized enterprises run by criminals[1]. These organized crime groups have some structural characteristics: organized continuing hierarchy, rational profit through crime, use of force or threat, corruption of public officials for immunity, and public demand for services[2].

The Korean mafia also has the similar characteristics to international criminal organizations regardless of short history, small size and narrow activity comparing to those of international mafia.

There have been many named local gangs and organized crime groups in South Korea operating businesses within small size and local scope to make extra money, but the money is not their main income. Their major source of income comes from illegal activities that forcibly require a kind of protection fees in exchange for not damaging business. These days, organized crime groups have expanded their activities for earning money to concession of housing redevelopment business, stock-in-trade manipulation, intervention of labor-management dispute, and laon-sharking. They used to be mobilized for the political purposes especially in the 1970s and 1980s.

Judging from the criminal situations in Korea, the damages from organized crime are generally more wide-ranging than the ones from other crimes. There are a lot of significant difficulties in investigating the illegal activity of organized crime groups. More importantly, they will be likely to negatively affect social-economic situations as they cause a large-sized victims, use organized and cruel violence like murder, and commit brutal crimes including human traffic.

There are so little studies on the Korean organized crime regardless of its rapid development and large influence on the social-economic situation. In particular, there is a lack of studies for identifying the characteristic of the Korean organized crime in terms of finding the effective strategy to control and eradicate its illegal activity.

We focus on analyzing the characteristic of the Korean organized crime based on the general characteristics of organized crime that are described in the relevant literatures. This study employs a social network analysis to confirm what the characteristics of the Korean organized crime are and how they are linked with in personal, structural, and influential network.

The study uses big data related to organized crime that can give implications to us to identify or understand the characteristic of organized crime in Korea.

2. Theoretical Framework

2.1. Definition of organized crime

It is important to be clear about what we mean by organized crime. Much of the public debate on organized crime so far has been focused on narrow approaches based on understanding criminal phenomena relating to criminal cases such as organized violence, murder, depredation, etc. Various attempts, however, have been made to expand the conceptional definition of organized crime with situational approaches that depend on understanding multidimensional phenomena including social, economic, political, and cultural circumstances that are affected by activities of organized crime groups.

Organized crime has been considered to be a major threat to human security, impeding the social, economic, political and cultural development of societies worldwide. It is a multifaceted phenomenon and has manifested itself in different activities, including, among other things, drug trafficking, trafficking in vehicles, trafficking in firearms, the smuggling of migrants, and money laundering, etc.[3]. Definitions of organized crime are very different because organized crime has something to do with various crimes as mentioned above and it has each country's background and unique historical experience[4]. Due to this, it is said that the term organized crime is highly ambiguous[5,6]. In addition, discussions of organized crime lack focus because it is not clear what precisely is being talked about[2].

According to the literatures, however, there are some general attributes to contribute to the definition of organized crime. Cohen(1997) shows two attributes: one is structures of association and the other structures of activity. Structures of association refer to group organization or the hierarchy, centralization, discipline, unity and power of groups. Structures of activity refer to the types of crime activities that organized crime groups engage in or the types of crime delivered through organized crime networks[7]. Based on Cohen(1997)'s work, organized crime is a continuing criminal enterprise that rationally works to profit from illicit activities that are often in great public demand[8].

2.2. Characteristic of organized crime

It is not easy to find the consensus on the definition because of a variety of characteristics that make the concept more ambiguous.

Albanese(2015) shows conspiracy, provision of illicit goods and services, infiltration of business, extortion, and racketeering as the characteristics of organized crime[9]. These include organizing criminal group, the primary source of revenue, and scope of organized crime activity based on typology of crimes committed by organized crime groups.

Depending on Caldwell(1956), organized crime has 11 important characteristics: team work, hierarchical structure, planning, reserved fund, centralized authority, specialization, division of labor, violence, monopoly, protective measures, and conduct norms[10].

Albanese(2007) presents 10 different characteristics through analyzing the definitions of organized crime by many authors. These include organized hierarchy continuing, rational profit through crime, use of force or threat, corruption of public officials to maintain immunity, public demand for services, monopoly over particular market, restricted membership, being nonideological, specialization, and code of secrecy[8].

It is seen that 5 characteristics of them are most typical or common: organized continuing hierarchy, rational profit through crime, use of force or threat, corruption of public officials for immunity, and public demand for services. On the other hand, there seems to be less consensus about whether organized crime holds a monopoly over particular markets, has restricted membership, is no ideological, specializes in certain activities, has a code of secrecy, or engages in extensive planning of its activity[2].

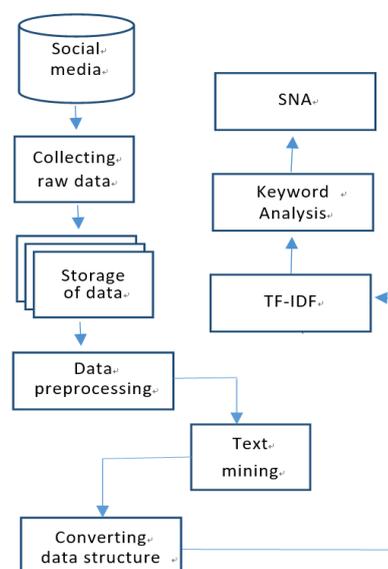
Taking a closer look at these characteristics, we can realize that organized crime has some organizational structure with the formal system of task and authority relationships that control how people coordinate their actions and use resources to achieve organizational goals[11]. Organized crime groups have their goals like earning money and use system and procedure to conduct effective task such as hierarchy, authority, planning, division of labor,

personal management, etc. They also make evolution of methods to obtain their goal from using violence which is inherent in and is most effective with but has a big risk to operating business which is more likely to be illegal like monopoly and organized ally for corruption to hold particular markets.

3. Research Methodology

We employ big data with important information on the characteristics of the Korean organized crime so we spent much time on collecting raw data and processing it into analyzable data. Raw data as big data have unstructured attribute to be analyzed. The research uses Web crawler on R project to collect texts related to organized crime from 1990 and 2018 on social media like major newspapers including Kyunghyang Shinmun, The Chosun Ilbo, Maeil Business, etc. Text mining is used to extract nouns from review data by using stemming analysis for converting unstructured data into structured one with term-document matrix. After that, we calculate the weight of terms by employing TF-IDF(Term Frequency-Inverse Document Frequency) as one of the most popular term-weighting schemes. We finally use SNA(Social Network Analysis) to identify the major characteristic of the Korean organized crime and investigating networked structures.

Figure 1. Research procedure.



4. Analytical Results

As we can see from the <Figure 2>, during 1990 to 2018 as research period, the number of crime cases that organized crime groups in Korea have committed has fluctuated pattern showing that the Korean organized crime has not continually expanded its activity and growth, but the trend does not mean that organized crime groups have no or little influence on the society or some locals like their activity areas.

The active period of organized crime is the early years and the middle years of the 1990s. Since the 2000s, however, organized crime groups have stayed in a downturn with a little bit of raised activity in the early years of the 2010s.

Figure 2. Crime cases of organized crime.



We collected 39,421 words by using Web crawler, but the raw data cannot be analyzed because of unstructured text. We employed text mining to process natural language and morphological analysis to extract adjectives and nouns. 34,759 were processed as natural languages and then 31,356 were extracted as meaningful and appropriate words for our research by using stemming analysis.

The <Table 1> shows high-ranking 27 keywords from the result of keyword analysis based on TF-IDF. According to the table, ‘without physical restraint’, ‘breach of law’, ‘sexual assault’, ‘prostitution business’, ‘loan-sharking’, ‘drug traffic’, ‘fraudulent gambling’, ‘arrest’, ‘insurance fraud’, ‘amusement spot’, and ‘violence’ have higher frequency relating to the Korean organized crime. On the other hand, ‘reconstruction of organized crime’, ‘fixing game’, and ‘contract violence’ have relatively less frequency. Judging from these keywords, we can identify that the Korean organized crime has a major purpose for earning money

by running illegal businesses like prostitution, fraudulent gambling, loan-sharking, drug traffic, etc. The Korean organized crime also violates laws and commits sexual assault. Considering the negative impact from them, it does not have severe punishment.

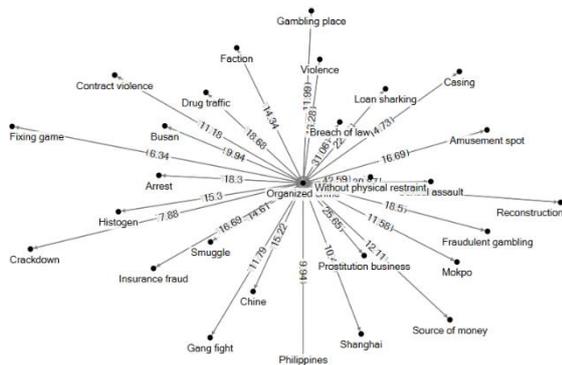
Table 1. Text mining with organized crime.

Keyword analysis(TF-IDF words) (n=31,356)		
Variables		Amount
1	Without physical restraint	41.73
2	Breach of law	30.44
3	Sexual assault	30.25
4	Prostitution business	25.14
5	Loan-sharking	22.3
6	Drug traffic	18.31
7	Fraudulent gambling	18.13
8	Arrest	17.93
9	Insurance fraud	16.36
10	Amusement spot	16.36
11	Violence	15.95
12	Histogen	14.99
13	China	14.92
14	Casing	14.44
15	Smuggle	14.32
16	Faction	14.05
17	Source of money	11.87
18	Gambling place	11.75
19	Gang fight	11.55
20	Mokpo	11.35
21	Contract violence	10.96
22	Shanghai	10.23
23	Busan	9.74
24	Philippines	9.74
25	Reconstruction	7.88

26	Crackdown	7.72
27	Fixing game	6.21

From the <Table 1>, this research can draw the network of characteristic of the Korean organized crime based on 27 keywords' correlation with organized crime. The distance values mean the degree of relationship with organized crime. According to the <Figure 3>, 27 characteristics describe that what is the important elements in the Korean organized crime. The network does not have any sub-network which can give critical meanings to understand how each characteristic is associated with each other, but it is meaningful enough to identity major activity and operational way of Korean organized crime.

Figure 3. Network of characteristic of Korean organized crime.



The research is to identify characteristics of the Korean organized crime based on the theory from foreign organized crime cases. Caldwell(1956) presents 11 important characteristics and Albanese(2007) shows 10. Generally, characteristics of organized crime can be summarized 5: organized continuing hierarchy, rational profit through crime, use of force or threat, corruption of public officials for immunity, and public demand for services.

As we can see from the <Table 2>, the Korean organized crime has organized hierarchy continuing, rational profit through crime, use of force or threat, restricted membership and overseas activity and refuge. The Korean organized crime puts top priority on rational profit through crime by conducting prostitution business, loan-sharking, drug traffic, fraudulent gambling, insurance fraud, amusement spot,

smuggle, contract violence, gambling place, and fixing game. The Korean organized crime uses violence, sexual assault, and casing as tools for use of force or threat. Keeping history and reconstructing organized crime are main ways of organized hierarchy continuing.

It is very interesting that the Korean organized crime has its overseas activity and refuge such as Shanghai of China and the Philippines in where the Korean police have some limitation on investigative power. The Korean organized crime also competes to secure or keep other profitable areas or its own one creating new factions. Due to this, it is very hard for the Korean organized crime to have or maintain continuity.

Table 2. Characteristic of Korean organized crime.

Rational profit through crime	Prostitution business Loan-sharking Drug traffic Fraudulent gambling Insurance fraud Amusement spot Smuggle Contract violence Source of money Gambling place Fixing game
Use of force or threat	Violence Sexual assault Casing
Organized hierarchy continuing	Histogen Reconstruction
Restricted membership	Faction Gang fight
Overseas activity and refuge	China(Shanghai) Philippines

5. Conclusion

The findings of the research illustrate that it is possible to present major characteristics of organized crime in Korea as follows: rational profit through crime, use of force or threat, organized hierarchy continuing, restricted membership, and overseas activity and refuge. These are similar to the characteristics of foreign organized crime, but there are significant differences in size and operation. Although it is hard

to compare to the size and operation of Mafia, Triads, and Yakuza, the Korean organized crime apparently has organizational structure, activity, and power as an international organized crime. It is important to be recognized that the Korean organized crime has the potential possibility for developing into an international organized crime.

With foreign organized crime, earning money is the main goal of the Korean organized crime. It commits illegal activities to raise a source of money which is used to keep or expand its organized crime groups. In particular, the Korean organized crime directly runs illegal businesses or forcedly controls trade rights to require a kind of protection fees in exchange for not damaging business. Cutting off the source is a very important way of eradicating or ending organized crime[12][13]. Considering Korean situation, organized crime is now falling into the decline so it is time for Police Agency to take special actions like a general crackdown on illegal activity for the source of money of organized crime. The Korean organized crime is moving to foreign countries including China and the Philippines for surviving and expanding organization. The effective policing to eradicate the illegal activity and to minimize victim from organized crime is to continually search for and cut off the source of money.

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The Relationship between Cognitive Factors and Suggestibility in Children: Focused on the POLICE SCIENCE Perspectives

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Abstract

The importance of understanding suggestibility in forensics increased the empirical research studies on how a number of factors influence suggestibility in children. This paper is to examine the relationship between cognitive factors such as language abilities, memory, theory of mind, creativity, and suggestibility in children. Previous research studies suggested that two categories such as language abilities, when a comprehensive language was measured, and creativity were found to have a consistent relationship with suggestibility. Implication for police officers and psychologists for interviewing children witnesses or victims were discussed.

[Keywords] Cognitive Factor, Suggestibility, Children, Victim, Police Science

1. Introduction

Due to landmark child sexual abuse cases in the mid-1980s, such as the McMartin case, the forensic importance of understanding suggestibility in children increased the empirical research studies. There have been studies on how a number of factors influence suggestibility in children: the use of specific or forced-choice questions, the introduction of stereotype, long term delays, intimidation, cues/props, and anatomically detailed dolls[1]. Adults in general have a negative view of young children's cognitive capabilities and many research results also suggested that mock jurors have viewed child witnesses to be less credible than adult witnesses because children are more susceptible to misleading questions and information[2][3]. This susceptibility to misleading information is suggestibility, which refers to "the degree to which children's encoding, storage, retrieval, and reporting of events can be influenced by a range of social and psychological factors"[4]. Based on the definition, inaccurate or distorted reports of

a child are influenced by both social and cognitive factors. Social factors may first influence lead to misinformation or misleading questions, but they may also lead to cognitive impairments involving memory changes with time. However, most of the research has been focused on external factors that increase or decrease suggestibility, such as interviewing techniques.

The purpose of this paper is to examine and identify the cognitive "internal" factors that influence children's suggestibility by reviewing the cascade of empirical research studies. It is clear that understanding both individual and developmental differences in cognitive factors is important since children's ability to provide accurate information depends on their memory capacity and ability to report information.

2. Cognitive Factors and Suggestibility

It is important to understand children's capacity for providing accurate information about their experience in court as witnesses or victims.

Based on a number of empirical studies, it is believed that children from approximately 4 years of age begin to form the ability to provide reliable and competent information[4][5]. For example, the concept of a lie is complex to children and their ability to understand the difference between truth and lies varies, but their understanding of the concepts increases continuously from around the age of 4 years. Furthermore, when children get older, their recall increases in terms of length, the amount of information, and complexity even though the basic structure remains the same[6][7]. However, it is just not possible to predict which children will be accurate witnesses and developmental and neurological change alone cannot fully explain children's performance. Children's memory can vary in terms of degree of accuracy and the accuracy can be distorted by adult intervention and/or affected by their difficulty distinguishing between real-life events and imagined or suggested events. A series of empirical studies[1][4] illustrated the effects of the repeated use of suggestive questions posed to very young children and the difficulty in correcting false information or statement questions from the interviewers. Younger children are more dependent on adult questions in order to search their memories in an efficient, systematic and organized fashion than are older children. Therefore, suggestibility in children must be understood or interpreted carefully because a variety of factors can influence what and how the children report. The effects of children's cognitive factors, such as linguistic abilities, memory, theory of mind, creativity, on suggestibility have been examined to explain and predict how cognitive internal factors influence suggestibility.

3. Language Abilities

First, a series of research studies was conducted in order to examine the relationship between the language abilities and suggestibility in children by using a variety of language assessment tools. Some research failed to find a significant relationship between language abilities and suggestibility when there was only one measure of language ability, usually vocabulary or receptive language[8][9]. However, other research findings, using a comprehensive language

battery in preschoolers, suggest that there is a significant relationship between language abilities and suggestibility. For example, Clarke-Steward, Malloy, and Allhusen(2004) examined the relationships between language abilities in five year old children and their suggestibility to misleading questions about an event that occurred about nine months ago. The results suggested that language abilities, inhibitory control, and the quality of children's relationships with their parents significantly and consistently influenced suggestibility in children. Suggestible children were more likely to have limited language skills, a lack of self-control and patience, and an insecure relationship with parents. Children with lower level of verbal comprehension, expression, and fluency, listening ability, speech spontaneity, and the ability to carry a conversation with adults as well as overall self-control in real life situation had a significant relationship with suggestibility in children. The above findings were already supported by previous research studies[10][11][12].

Furthermore, children's ability to communicate, such as speech style or manner of testifying as a witness, influences jurors' perception of credibility. Since jurors and judges make attributions about the credibility of a witness or victim based on the appropriateness of his or her language used during testimony, credibility judgment will be influenced by the speech style of the child witness or victim. For example, if a victim is expected to perform below the norm(such as a child), but performs at the norm level instead, the credibility of the victim will be inflated. If a victim is expected to perform at the norm level, but performs below the norm, the credibility will be underestimated. Ruva and Bryant(2004)[3] examined the effects of the age of witnesses, speech style, and prosecutor's questioning style on perceived witness credibility and trial outcome. The speech style of a child witness was manipulated as either powerful or powerless. Powerless speech condition includes false starts(e.g., "I...I saw...I heard"), verbal hedges(e.g., "I think," "kind of"), and verbal hesitation(e.g., "um," "well"), whereas powerful speech condition does not contain any of those feature in the testimony. The results indicated that the child witness with powerful speech style was rated as significantly more credible than the

child witness with powerless speech style. However, the effects of speech style on credibility judgment were greater in the adult witness condition than the child witness condition since a child witness speaking in a powerless style should not be viewed as lacking credibility because language expectancy is lower for children than adults. Furthermore, when open-ended questions were asked to the six years old witness, the child was viewed as more credible than ten or twenty-two year old witnesses. It means that a child witness who is able to provide answers sufficiently to open-ended questions should be evaluated as more credible than an adult witness who responded in a similar manner. Therefore, participants in the six year old witness with open-ended question condition were more likely to rate higher guilt ratings and yield guilty verdicts than ten or twenty-two year old witness conditions.

Although there are mixed research findings on language abilities and suggestibility, research studies suggest that there is a relationship between overall language abilities and suggestibility. Furthermore, the perceived ability of a child to coherently and clearly report his or her experience in court, also influences the credibility judgment of the child witness.

4. Memory

There have been research studies that examined the relationship between memory influences children's suggestibility. How well children are able to remember and communicate memories to others determines their ability to provide accurate information. Child witnesses or victims of crimes, whether they are intellectually in normal range or disabled, may receive questions repeatedly before giving testimony in court. Henry and Gudjonsson(2004)[13] compared children of ten to thirteen years suffering from mild and moderate intellectual disabilities(ID) with typically developing peers of the same chronological age(CA). The literature review indicated that suggestibility effects may be related to the strength of the memory trace because the stronger memories should be more resistant to suggestion than the weaker memories. According to the fuzzy-trace theory, the distinction between gist memory and verbatim memory provides a

framework for understanding the relationship between what types of memory are more activated or relied upon when children are interviewed or questioned during investigation. Because gist memory is used for meanings, concepts, and interpretation, free-recall and general questions are more likely to be relied upon in gist memory. Since verbatim memory is used for surface forms and item-specific information, specific question types, such as open-ended non-leading questions and leading and non-leading closed questions are more likely to rely upon verbatim memory, which is expected to decay more rapidly than gist memory. Researchers hypothesized that increasing memory trace strength should benefit intellectually disabled children and the effects of memory trace strength across question types should differ between the ID and CA children. The results suggested that there was no difference in effects of memory trace strength or memory process mechanism between ID and CA children. Furthermore, verbatim memory, in open-ended non-leading question and closed misleading question conditions, was benefited more from an increase in memory trace strength. Therefore, stronger memories are more resistant to the suggestibility.

More recently, Lee(2004)[14] examined the relationship between age, neuropsychological performance, the verbal paired associates scale, social cognitive status, and susceptibility to the misinformation in children(8 to 9 years old) and adolescents(15 to 17 years old) by using a various cognitive and social cognitive measures. The research findings indicated that performances of both children and adolescents were affected by misinformation. Further, a combination of neuropsychological and social cognitive measures provided reliable prediction to susceptibility. Participants with better associative memories(higher verbal paired associates scale, VPA) were more susceptible to the misinformation effect, but better associative memories were correlated with lower interrogative suggestibility. These findings show that better associative memory can be correlated with either higher or lower suggestibility depending on the way in which participants are misled. Furthermore, participants with better memories(scored by the medial temporal measure, such as California Verbal Learning Test and verbal paired associates

scale) were more likely to select the misinformation from in the recognition test and to misattribute the misinformation in the source memory test. Those participants were more likely to recognize the misleading information and reported that the misleading information came from an original source or post event information. Although some research results suggest no relationship between memory and suggestibility and some results suggest association between memory and suggestibility, it appears that children's suggestibility is not related to memory competence in general. A review of Bruck and Melnyk(2004)[15] suggests that somewhat mixed findings in memory and suggestibility research depends on context-specific factors rather than cognitive factors of individual children.

5. Theory of Mind

Theory of mind refers to "a cognitive capacity that allows us to know that others may have different feelings, intentions, and beliefs than oneself"[15] Empirical research suggested that most children develop theory of mind by the age of five and understand that two people can have conflicting beliefs about the world[16][17]. It is suggested that children's ability to understand theory of mind may act as a protection against the acceptance of misinformation. Children must be able to recall their original event, compare their original memory to what was suggested to them, and understand that one of the versions may be a more accurate representation of the event. The relationship between the development of theory of mind and children's suggestibility was examined by a number of researchers, but there are mixed findings about the relationship. Some studies found no relationship and some studies found that theory of mind decreases suggestibility. Literature reviews[15][18] indicated that the relationship between theory of mind and suggestibility is complicated and thus has mixed research findings. For example, a child with theory of mind can resist the suggestions of an interviewer because they can understand that the interviewer can have a false belief. In contrast, a child with theory of mind also can understand the false belief of an adult interviewer but choose to provide answers that are

consistent with the false belief for various reasons. Most recently, Scullin and Bonner(2006)[18] examined the relationship between development of theory of mind and suggestibility in three and five year old children in response to misleading questions about a live event. As expected, theory of mind was consistently related to children's lack of accuracy in response to misleading questions about a live event when children were given strong positive and/or negative feedback after each response to a misleading question. However, theory of mind was not significantly related to other suggestibility measures, shift(children's tendency to change their responses after receiving feedback) as well as total suggestibility measures. Since Melinder, Endestad, Magnussen(2006) and Bruck and Melnyk(2004) found that theory of mind measure was significantly correlated to resistance to suggestions, it can be concluded that a significant relationship is more likely to occur between development of theory of mind and suggestibility[19][15].

6. Creativity

The relationship between creativity and imagination and suggestibility were examined and a number of research findings consistently suggest that there are positive relationships between creativity and suggestibility in children. Melnyk(2004)[15] conducted a series of studies to examine the influence of imagery and individual differences on the accuracy of children's recall. The second study examined a relationship between false event creations and guided visual imagery instructions on preschool and third grade children. A magician performed two tricks on children in pairs and they were interviewed forty days after the magic show. The follow-up interview was conducted twenty-one weeks from the magic show and the children were interviewed in one of the four interviewing conditions: question and picture, question and imagery, question-only, and a non-reminder control condition. In the question and picture condition, children were asked to draw pictures about true and false events. In the question and imagery condition, children were asked to form mental images about true and false event[20]. The results demonstrated that the preschool

children were more susceptible to false event creation than the third grade children. The preschoolers who asked to form visual images of the false event included more false details in their false reports, although guided imagery did not significantly increase the rate of false reporting. In the fourth study, the author examined the relationship between false event creation and imaginative involvement. Children were asked to think about or imagine the false event through three interactions. The results suggested a significant relationship between preschool children's imaginative involvement and false event creation. Thus, imaginative and creative children were more likely to be suggestible and to elaborate their false beliefs. However, the effects of children's creativity on imagination and memory should be treated differently. When asked to "make something up" and "remember details about an event" after misinformation should be interpreted differently. Children in Melnyk's(2004)[12] study seem to have had no difficulty in creating or imagining an event, which means that those children were more prone to memory impairment. However, creativity should play a lesser role when children are asked to simply report about what they remember regarding an event. As discussed earlier, children should rely more on their memory in this case.

7. Discussion

As a number of child suggestibility literatures suggests, it seems that children can be informative witnesses from four years old of age. Moreover, the two categories, such as language ability and creativity, were found to have a consistent relationship with suggestibility. When language ability was assessed by a single measure of vocabulary, it did not yield significant results. The significant relationship between language and suggestibility was obtained when overall and comprehensive language abilities of children were assessed. Creative children were found to provide more elaborative narratives about suggested events in five to eight year old children. The theory of mind studies results provided mixed results. The relationship between memory competence and suggestibility in chil-

dren yielded mixed findings, possibly due to context-specific factors rather than cognitive abilities of individual children.

However, a more important question is whether a certain degree of psychological influence from investigators or interviewers would jeopardize children's ability to be able to recall accurately and be believed in the legal context. It is also important to make sure that the accuser of child sexual abuse cases should not be determined as culpable if the case is generally too leading or too suggestive during the preliminary investigation. Therefore, all professionals must provide children with a chance to give their own stories from their own perspective during the preliminary investigation and to induce them to give further and specific details about events that are considered to be important information in legal context. How the information is received is crucial for the quality of the witness report. It is clear that suggestive techniques used by all professionals must be avoided.

One technique that all professional can use is the source-monitoring technique, which found to decrease child witness suggestibility. Thierry and Spence(2002) examined whether source monitoring technique would decrease suggestibility in three to four year old children. Half of the children received source monitoring training and another half received recognition training after watching live and video events. After the training, all children answered misleading and non-misleading questions. In source monitoring condition, children were asked to indicate why a question was misleading or not misleading. The results suggested that children who received source monitoring training were more accurate in response to yes-no misleading and non-misleading questions, but researchers failed to find significant difference in misleading open-ended questions between children in a source-monitoring and a control group. The results suggest that a limited, but careful use of the source-monitoring technique can decrease suggestibility in children. Source-monitoring training could be incorporated into preliminary investigation to be used to elicit more accurate information from child witnesses although further research has to be conducted. The training involves truth-lie discrimination, reminding that they have "don't

know” response options, and using nonsuggestive open-ended questions[2][21].

In general, the review of research studies suggests that police officers and psychologists should implement scientific knowledge about how information from children can be negatively affected by their interventions. In order to minimize contaminating the quality of children’s reports during the preliminary investigation, investigators and psychologists should coordinate their efforts to standardize interview protocols and to increase the chances that the child will be believed in court.

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A Study on the Status and New Tasks of POLICING Technology R&D in Republic of KOREA

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Abstract

The development and change of advanced technology has brought about changes in almost every sector of the nation and society, and this is the same aspect worldwide. While technological advances have provided convenience in life, crime is also becoming intelligent and emerging in new forms. These changes require new policing needs and the corresponding agility of the police. Despite the worsening environment of law enforcement, such as advanced crime, citizen's demand for policing is increasing. Therefore, active use of technology has become essential for police activities. But we lack budget, infrastructure and attention. The revision of the Police Act provided legal ground for Policing Technology R&D, but systematic research is insufficient. Therefore, the study will assess the status of its and discuss future tasks in Korea.

[Keywords] Policing, Police, Technology, R&D, Crime

1. Introduction

The development and change of advanced technology has brought about changes in almost every sector of the nation and society, and this is the same aspect worldwide. IOE(Internet of Everything), the world's first surgical robot, combat robot, legal robot, and drone(unmanned aircraft) have been introduced, and space elevator will be possible in 2050. While technological advances have brought convenience and abundance of life, crimes are also evolving and changing into new forms, such as cybercrime and intellectual crime. These changes require a new form of policing needs and the proper response of the police.

In May 2012, '2012 European Police Chiefs' Convention' held in The Hague, Netherlands, emphasized the importance of SMART policing. This is an objective analysis of fundamental causes such as crime, focusing police force, and extensive use of scientific technology in police activities, thereby maximizing the effectiveness

of police activities by focusing on existing available resources[1]. Despite the worsening environment of law enforcement, such as advanced crime, the level of public demand for police is increasing. Active technology applications have become essential for the entire police force. However, the police have limited ability to respond. Fortunately, the revision of the Police Act in 2014 provided legal ground for Policing Technology R&D, and various policies are being implemented.

Nevertheless, sufficient infrastructure has not yet been deployed for technological advancement, and there is a lack of focus and investment[2]. The study presents changes in the policing environment brought by advances in science and technology, and introduces the Korean police's Policing Technology R&D status and key relevant cases. And it will suggest policy implications.

2. Theoretical Background

2.1. Definition of policing technology R&D

The word ‘Policing’ is generally defined as “the comfortable control of the country, the maintenance and preservation of the peace and order of the nation's society”(in Naver Language Dictionary). The state agency in charge of security is the police and its activities and duties are defined in the ACT ON THE PERFORMANCE OF DUTIES BY POLICE OFFICERS. Technology, the application of scientific knowledge to the practical aims of human life or, as it is sometimes phrased, to the change and manipulation of the human environment[3]. Policing technology is the wide range of scientific and technological methods, techniques, and equipment used in policing[4].

The Policing Technology can be divided into various forms, while Manning(2003) is divided into mobility technology, training technology, transformative technology, analytic technology, communicative technology, information-processing technology[5]. Wakefield & Fleming also claims the addition of weapons technology[6].

2.2. Current status of science and technology in Korea

Investment in R&D has remained at an annual rate of 11% since 1999, and increased from 1.33 billion to 1.89 trillion from 4.0% to 5.0% of total government spending. The role of national R&D projects changed from simple technology in the 60s and 80s to composite technology in the 2000s. And now its role is diverse, from government-led development to basic research, which is shared by universities and businesses, to applied research[7]. Until now, it had focused on imitation, development and commercialization centered on strengthening competitiveness of manufacturing industries. But increasingly, there are increasing quality of life and social problem solving, scientific technology infrastructure, and needs into a technology-oriented society.

2.3. Why, is it policing technology R&D?

The world we dream of is a world with nature, a world of abundance through new technologies and continuous growth, a world of human life and safety. However, the police must increase the efficiency of law enforcement using advanced technology because of the rapid advances in technology and the criminals using it[8,9]. The change in police tactics abroad is explained by the period. The technology introduced at each time of the year will serve as a major driver of changes in police action strategies and organizational structures[1].

Table 1. Historical change of policing[10].

Division	Political era (1840 to 1930)	Reform era (1930 to 1980)	Community era (1980 to present)
Authorization	Politicians and law	Law and professionalism	Law and professionalism, community support, political
Function	Broad social services	Crime control	Broad provision of services
Organizational design	Decentralized	Centralized, classical	Decentralized, task forces, matrices
Relationship to community	Intimate	Professional, remote	Intimate
Tactics and technology	Foot patrol	Preventive patrol and rapid response to calls	Foot patrol, problem solving, public relations
Outcome	Citizen, political satisfaction	Crime control	Quality of life and citizen satisfaction

There is an increasing sense of anxiety about the risks of crime due to increased crime and widespread damage, diversification, intellection and specialization. As the percentage of traffic, violence and intellectual crime among all crimes increases, the importance of investigation through scientific technology is increasing to operate limited security resources more efficiently

and effectively. The technological progress in police operations is as follows.

Table 2. A process of technological progress for policing[11].

Division	1881~ 1945	1946~ 1959	1960~ 1979	1980~ present
Maincontent	<ul style="list-style-type: none"> • Mobile patrol • Radio com. • Telephonecom. 	<ul style="list-style-type: none"> • Traffic violation detentioninstruments 	<ul style="list-style-type: none"> • 911 • Centralized dispatch • Civilian specialists • Research & development organization • Computer age begins 	<ul style="list-style-type: none"> • Telecommunications advance • Mobile data communications • Expert systems • Imaging • Biometrics • GIS

According to the Korea National Statistical Office's 2017 social survey, the number one cause of anxiety in Korean society is the occurrence of crimes. Also, a survey of the nation's crime rates over the past decade showed that 61 percent of all crimes were traffic, violence and intelligence. Crime has been on the rise lately and the rate of arrests is around 70 percent. The number of crimes and the rate of arrests are associated with several social and environmental factors. In order to improve the quality of life and build a safe and healthy society from crime, it is necessary to actively promote crime prevention and security R&D.

South Korea's R&D budget has increased by more than 10 percent annually over the past decade. For effective R&D projects, the government established '2nd basic plan for managing and utilizing R&D performance' in 2010 and announced the National R&D Performance Evaluation every year.

3. The Status and Case of Policing Technology R&D

3.1. The organization and related rules of policing technology R&D

Some of the related organizations in Korea include the National Forensic Service, the Police Science Institute, the Korean National Police Agency, the Korea Crime scene Investigation, the Korean National Police Agency Cyber Bureau. It is difficult to display the expected R&D capabilities, such as budget and manpower distribution, as they are divided into individual institutions, departments and work areas. As such, development and organization of R&D technology at national level have not been systematically implemented. There is also a level of R&D investment that does not match the high public demand for security. In 2015, a new research and development project for public security, science and technology was launched, and the project is worth only 2 billion.

According to Article 3 of the Research and Development Business Processing Rules for Science and Technology, the scope of R&D is defined as follows(in the Korean National Police Agency):
 ① Research and development to enhance technical skills in the prevention, suppression and investigation of crimes, ② Research and development to enhance the technical skills in the areas of security, guard and anti-terrorist operations, ③ Research and development to enhance technical skills in the field of traffic control and prevention of risks, ④Collecting and analyzing crime information in cyberspace, developing technical skills in the field of cybercrime prevention, investigation and electronic evidence analysis, ⑤ Research and development for development of police equipment and application of information and communication technology ⑥ Research and development for establishment of research infrastructure, equipment, manpower, ⑦other research and development in which the Director of the National Police Agency is recognized as necessary. However, systematic research and development project is still in the beginning stage.

3.2. The case of policing technology R&D

In the United States, the National Institute of Justice was established in the 1960s to conduct research on the development of technologies and equipment for the safety and criminal courts,

and to conduct research on the causes of crime. In 2010, it allocated 88.7 billion won(26.7 percent of the total budget) and invested 78 percent of the budget, especially in R&D for science technology and capacity building for training, investigation and criminal analysis. In the UK, security-related technology development is centered on the Home Office Scientific Development Branch and National Policing Improvement Agency.

According to the current status of R&D in major policing areas in Korea, the field of forensic science, scientific investigation, and transportation accounts for 75 % of all cases(e.g., identity identification technology, smart system, etc.). On the other hand, only 14 percent of studies are related to crime prevention(National Science & Technology Information Service).

4. A New Tasks

4.1. Establish a systematic and comprehensive implementation system

We recently realized the need for the introduction of a police organization dedicated to R&D and technological development through changes in police activities in developed countries and applications of technology. However, the South Korean government has little experience in implementing the Policing Technology R&D. Only partial studies of issues such as the quality of life have been conducted in some institutions. The effectiveness of ongoing research is also questionable due to the lack of a system, as well.

Therefore, basic plans and implementation plans that reflect mid-to long-term roadmap are needed to develop technology and conduct effective research. This should include the establishment of a dedicated research organization and the development of specialized human resources. It is an organization to support the police. The aim is to provide technologies and systems that can predict and effectively respond to future risks in society. In the long term, it is urgent to establish a research institute, a type of state-initiated research institute[2][12].

4.2. Shared growth and collaboration of the safety services-related industries

Currently, there is a public and private infrastructure(CCTV, etc.) that can be used for policing. However, due to lack of technology and systems, it is only partially utilized. In addition, it is difficult to secure investment efficiency due to the problem of legacy, in which fragmented technology development is pushed forward as required by each department and the connection with existing infrastructure is not considered. Strategic investment execution is needed to maximize investment efficiency. In addition, efforts to implement a safety society through growth of the private sector are necessary. Korea's security industry revenue, combined with information security and physical security, is about 5.5 trillion won in physical security and 1.6 trillion won in information security(KISIA, in 2017). In particular, the security market is expected to continue to grow more than 7 percent per year until 2022 as more single households, aging households, and unmanned shops grow. For the sake of public security, it is urgent to secure a foundation for shared growth with related industries, including high-tech safety and security services.

4.3. SMART Policing

SMART Advertising is a police action strategy that emphasizes the use of strategic management, Analysis & Research, Technology[13]. This is a new strategy given by the lack of resources and intensive police management of scientific technology. With the development of science and technology, it is the Policing Technology R&D that can link it to the police force.

However, support and understanding of the public is essential to the success of the Policing Technology R&D. In the United States, the priority of the Policing Technology demand is police-community relations. If the government develops and utilizes the technology to limit the demands of the police and practical needs, it will likely violate basic rights, including the privacy of the people, and will face the difficulties of public opposition and budget acquisition[9]. It should

not be forgotten that the core of policing is their relationship with citizens. Therefore, intensive research should be done to prevent and respond to life crimes that are closely related to the safety of the people, to violate the people's livelihood, and to expel disorder around life.

5. Conclusions and Discussions

Crime is also becoming intelligent and specialized as technology advances. Developed countries are already stepping up their research and use of technology to counter new forms of advanced crime. Korea also needs a new security strategy for keeping citizens safe and in order from crime through Policing Technology R&D. However, there is very little interest and policy support, and national consensus is still lacking.

Therefore, investments should be made in systematic and planned R&D that includes a security R&D roadmap. First of all, appropriate technologies should be developed for the gradual expansion of investment to meet public demand and national awareness. Such efforts will lead to the expansion of infrastructure in the field of security and effective and organic cooperation among the parties involved. Ultimately, these efforts will help reduce the people's fear of crime, establish effective security policies and prepare criminal measures.

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