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Monica K. Miller
University of Nevada, Reno

Timothy Griffin
University of Nevada

Samantha S. Clinkinbeard
University of Nebraska at Omaha, sclinkinbeard@unomaha.edu

Rebecca M. Thomas
University of Nevada

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The psychology of AMBER Alert: Unresolved issues and implications

Monica K. Miller^{a,b}, Timothy Griffin^b, Samantha S. Clinkinbeard^c, Rebecca M. Thomas^a

^a *Department of Social Psychology, University of Nevada, Reno, NV 89557, USA*

^b *Department of Criminal Justice and the Interdisciplinary PhD Program in Social Psychology at the University of Nevada, Reno, NV 89557, USA*

^c *School of Criminology & Criminal Justice, University of Nebraska, Omaha, NE 68182, USA*

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Abstract

The AMBER alert system is likely affected by a number of psychological processes, yet remains understudied. The system assumes people will remember Alert information accurately and notify police, but psychological research on related phenomena (e.g., memory, willingness to help) indicates that people may not be able or willing to act in ways that promote the success of the system. In addition, the system is intended to deter child abductions, however, the system could prompt copycat crimes from perpetrators seeking publicity. The system could also cause a precipitation effect in which a perpetrator who sees the Alert could decide to murder the child immediately to avoid capture. Policy recommendations are made based on psychological research and theory, although more research is needed to develop the most effective system possible.

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1. Introduction

When 9-year-old Amber Hagerman was abducted in 1996 in Arlington, Texas, there was no formal system that could publicize information quickly about her disappearance. After her body was discovered 4 days later, support grew for a warning system that would utilize the public in the recovery of abducted children. The ultimate result was the development of the nationwide “America’s Missing: Broadcast Emergency Response,” better known as the AMBER Alert system. The AMBER Alert law was passed by Congress in 2003, and by 2005, all 50 states had implemented AMBER Alert systems (Department of Justice, 2005; Zgoba, 2004).

The U.S. Department of Justice (2004) recommends that an AMBER Alert be issued when the following criteria are met: (a) law enforcement officials have confirmed that an abduction has occurred, (b) the child is likely in imminent danger, (c) descriptive information about the perpetrator and/or victim is available, (d) the child is under 18 years old, and (e) information about the child has been entered in the National Crime Information Center (NCIC) system. The Federal Bureau of Investigation and the National Center for Missing and Exploited Children (NCMEC) are subsequently notified (Department of Justice, 2004), and Alerts are disseminated to the public through roadside signs, television announcements, and the Internet. A system put in place in 2005 allows individuals to sign up to receive Alerts through their cell phones (NCMEC, 2005). SurferQuest, a company that controls computer kiosks found in hotels and cafes, displays any ongoing AMBER Alerts when the kiosks are not in use (Associated Press, 2005). These efforts are intended to provide information that will help the public identify the perpetrator and child and notify law enforcement so that the child can be rescued.

Research on AMBER Alert’s benefits is of course necessary before any definitive conclusions are drawn about its overall utility. Indeed, there is concern that the Alert system has inherent flaws (e.g., Miller & Clinkinbeard, 2006). However, some could argue that the system is relatively new and any existing “kinks” need not be cause for reflexive cynicism toward its prospects. Nonetheless, there are multiple psychological considerations that pose serious challenges to the assumption that citizens will be able and willing to provide a crucial tip that saves an abducted child’s life. In general,

psychological processes associated with memory and crime reporting could impact the effectiveness of Alerts. Because the broader effects of the system have not been rigorously studied, many questions remain unanswered. For example, how likely is it that people accurately remember information in the Alerts so that they can later recognize a perpetrator? Though the number of children saved is an important indicator of success, it is not the only one that deserves attention. AMBER Alert also likely affects perpetrators in a number of ways that remain unstudied. For example: could the system actually lead a perpetrator to panic and harm the child sooner than he had intended? We discuss possible answers to such questions and offer suggestions for future research and policy changes.

It is important to note, however, that the theoretical considerations and prior research that will be discussed here did not examine the Alert system directly. Thus, all conclusions are speculative. We present research on related topics with the intent of demonstrating some of the unknowns that surround the Alert system. In doing so, we make assumptions that processes found in existing research also would work in the context of AMBER Alert but hope that this article will inspire empirical tests of these assumptions.

2. How psychological processes could impact the effectiveness of AMBER Alerts

In theory, the AMBER Alert system is straightforward. The Alert is issued, the public looks for the child and perpetrator, a citizen gives a tip to police and the police catch the perpetrator. This model involves a number of questionable assumptions about the psychological processes that are required for the system to be successful. First, it is assumed that citizens will pay attention to this information. Next, it is assumed that they will be able to recognize the perpetrator. Finally, it is assumed that citizens will be willing and able to report the sighting to police. Available empirical research and psychological theory, as specified below, challenges all these assumptions.

2.1. Memory research

Memory involves a series of cognitive processes including acquisition, retention,

and retrieval. In the only study we know of that investigated memory for AMBER Alert messages, participants 'drove' along a computerized highway. Following the driving exercise they were asked to recall the AMBER Alert message that had appeared on a roadside sign. Only 10 of 120 drivers were able to remember much of the AMBER Alert information, such as 5–6 characters of the license plate number (Harder & Bloomfield, 2003).

More general research on memory has indicated that an individual may have difficulty acquiring information if he is distracted by other things (Sweller, van Merriënboer, & Paas, 1998), or if he is not given enough time to adequately encode the information (DiNardo & Rainey, 1991; Shapiro & Penrod, 1986). For instance, an AMBER Alert presented during the nightly news is unlikely to be encoded in to memory if the viewer is "cognitively busy" helping her child with homework. Further, short exposure periods, such as those typical of roadside messages, may prevent acquisition. Despite these limitations, evidence suggests that repeat exposure to information makes details easier to remember at a later time (Berger, 1999; Bluck & Li, 2001). Thus, repeated exposure to Alerts, may improve encoding of information, even if the audience is cognitively busy or exposed only briefly.

Even if individuals acquire the information, they still must be able to retain (i.e., remember) the information accurately. The most common cause of 'retention failure' is simple forgetting. Research supports the commonsense notion that people are more likely to forget – or be less accurate – as more time passes (Ebbesen & Rienick, 1998; Hannigan & Reinitz, 2000). Thus, it is essential that individuals are exposed to the Alert information frequently to prevent inaccurate memory due to passage of time.

Even though repeated exposure can help a person recall information, more is not always better. The Texas Department of Public Safety used the term "AMBER fatigue" to describe the risk that people who view numerous AMBER Alerts will begin to ignore them. Furthermore, persuasion research indicates that a high level of exposure can actually backfire, leading to less agreement with the promoted message (Cacioppo & Petty, 1989). Thus, Alerts should not be issued too frequently to prevent the public from losing interest. Research is needed to determine the line between "enough" and "too

much.”

Next, individuals must be able to retrieve (i.e., recall) this information. Errors in retrieval can be caused by source attribution errors; this occurs when a person mistakenly believes that a piece of information is from one source, when in reality it came from another source (Zaragoza & Lane, 1994). For example, a person could see a news item about a girl who won an award and also see a story about an AMBER Alert issued for an abducted girl. The person could later see the girl in the Alert, but mistakenly think that the girl looks familiar because she was the girl who won the award. Because of the source error, the person does not realize that she has seen the missing girl. A second error in retrieval, memory reconstruction, occurs when the original memory changes as a result of information received after the event (Loftus, 1977). For instance, a person may read an Alert describing a blue car; however she may later talk with a friend who says that the car was green. As a result of the misinformation, the person reconstructs her memory. Now she is on the lookout for a green car.

Another factor that may make it difficult to recognize a child or perpetrator is a phenomenon called ‘own-race bias.’ Simply put, people are better able to identify a person of their own race as compared to a person of another race (Meissner & Brigham, 2001). Thus, a white person who views an AMBER Alert containing a black perpetrator or black child will, on average, be less able to identify those people later. Errors such as those described here may negatively affect the Alert system’s ability to function as intended.

2.2. Influences on helping behavior and crime reporting

Even assuming that no memory errors occur and a person recognizes a perpetrator, there is still no guarantee that she will report the sighting to the police. There is no research on willingness to report AMBER Alerts to police, and little of the more general research involves reporting crimes committed against others. Instead, most research has investigated willingness to report crimes against the self. Other applicable research has investigated helping behavior. Such studies differ from the AMBER Alert context because they typically involve the victim asking for personal help—which is not

the case in an AMBER Alert situation. Nevertheless, this general information is helpful in understanding the nuances of the Alert system.

The literature on social influence, witness characteristics, and perceptions of crime can provide an understanding of the psychological factors that may influence crime reporting decisions. Social influence can affect willingness to report a crime (Greenberg & Beach, 2004). For instance, advice from another could dissuade someone from reporting a sighting that may be of potential interest to the Alert. Social influence can also impact helping behavior (Karakashian, Walter, Christopher, & Lucas, 2006). People are less likely to help a person in need if there are others around who could help. As a result, an individual may fail to report an AMBER Alert sighting because he or she thinks 'someone else' will do so. Such research indicates that willingness to report is affected by the social situation, so research is needed to determine how to identify and overcome these potential obstacles in the AMBER Alert context.

Witness characteristics may also affect willingness to help. For instance, people who experience empathic concern are more likely to help (Batson, Elklund, Chermok, Hoyt, & Ortiz, 2007). People are also more likely to help someone of their own race (Piliavin, Rodin, & Piliavin, 1969), or if the person is of another race but exhibits socially desirable characteristics (Katz, Cohen, & Glass, 1975). In general, men are more likely to help than women, and women victims are more likely to receive help (Eagly & Crowley, 1986). Helping behavior is likely a very complex phenomenon, however, as it is affected by the combination of influences including social situations, race, and gender (Thayer, 1973; Wispe & Freshley, 1971). For example, men were more likely to help than women, but only in the presence of others (Karakashian et al., 2006). More research, specifically studies that investigate AMBER Alerts, can help design Alerts that encourage individuals to report possible sightings of the perpetrator or child.

Perceptions that a crime is severe can also promote crime reporting (e.g., Bachman, 1998; Schneider, Burcart, & Wilson, 1977). Thus, individuals who perceive that abducted children are in serious harm may be more willing to report seeing the perpetrator. This is important because many Alerts are issued due to parental abductions (Griffin, Miller, Hoppe, Rebideaux, & Hammack, 2007; Hargrove, 2005). If a person feels

that the child abducted by a parent is in little danger, she may not report it.

In sum, there are a variety of psychological factors and processes that affect the success of the AMBER Alert system. In essence, the Alert system requires accurate memory processes and a willingness to report the crime. More specific research is necessary to understand fully how these psychological processes might affect the success of the AMBER Alert system.

3. How AMBER Alerts affect perpetrators

Deterrence theory suggests that watching others being punished may deter someone from committing a crime (Piquero & Paternoster, 1998; Stafford & Warr, 1993). However, this simplistic theory may not apply well to AMBER Alert. It is highly doubtful that most abductors rationally weigh the costs or benefits of their actions, as would be required by deterrence theory. Many sexual offenders, for example, have emotional or cognitive dysfunctions (see Beech & Mitchell, 2005, for a review) that prevent logical decision-making. Other abductors are parents who believe they are making the best decision for their children (Greif & Hegar, 1994). Thus, Alerts may not have the desired deterrent effect.

Even more concerning is the possibility that AMBER Alerts may backfire. Although Alerts have encouraged some perpetrators to return the abducted child (Griffin et al., 2007), there is concern about a possible “precipitation effect.” In this instance, the perpetrator sees the Alert and quickly commits his crime (e.g., assault or murder), believing this maximizes the chance of avoiding capture. Another concern is that the Alert system encourages “copycat” crimes. Although it is difficult to determine how many crimes are truly copycat crimes, interviews with male juvenile delinquents found that about 25% of male juvenile delinquents have attempted a copycat crime (Surette, 2002). Finally, Alerts can act as an educational tool for perpetrators. For instance, Alerts often contain the license plate or the make of the car the perpetrator is driving. Thus, a perpetrator can use this knowledge to his advantage, and can acquire a different car or new license plates to thwart the Alert’s intent. As these examples illustrate, Alerts may deter crimes; however, there is also a possibility that they may have the opposite effect.

4. Implications for other social sciences

Up to this point we have focused on the psychological implications of AMBER Alert for individual offenders and prospective citizen participants. However, perhaps the most important psychological feature of AMBER Alert is the role it plays as both reflection and cause of the social construction of crime and its solutions. Perceived threats to children have frequently induced reactionary public policy responses (Best, 1990; Jenkins, 1998), and AMBER Alert has followed a well-documented pattern in which moral panic incited by a few sensational incidents has led to potentially ill-conceived responsive measures (Zgoba, 2004). Where a moral panic occurs over perceived threats to vital social assets – especially threats to children – the resultant public policy responses are more significant for their symbolic role in clarifying social values regarding what is “right” and “wrong” than for their tangible benefits (Tonry, 2004). In this light, the adoption of AMBER Alert in response to the Amber Hagerman case and similar tragedies can be regarded as a societal affirmation that child abduction is bad and that social concern for the issue is good.

The problem is that available empirical evidence casts doubt on the effectiveness of AMBER Alert, as the system usually only “saves” children in relatively little peril and is essentially powerless to intervene in truly menacing cases (Griffin et al., 2007). Nonetheless, advocates continue to promote the system aggressively as “saving lives” (Department of Justice, 2006). This contradiction between empirical validation (or lack thereof) and social acceptance has resulted in AMBER Alert being identified as *crime control theater* (Griffin & Miller, 2008). The highly publicized and romantic system is socially constructed by advocates and the media as “solving” the child abduction problem even though the evidence suggests it accomplishes no such thing. The sensational child abduction crimes that induce moral panic and inspire public policies like AMBER Alert are generally tragic events that are not amenable to solution, so they generate theatrical, symbolic ones to assuage a public that demands that “something” be done (Griffin & Miller, 2008).

Thus, in the end, the real psychological power of the system might not be in its ability to deter offenders or inspire citizen participation in crime control but its impact on

society and its institutions coping with moral panic. In this sense, future research on AMBER Alert must move beyond mere examinations of effectiveness and psychological factors that might affect it, which are largely the domains of criminal justice and cognitive psychology. The significance of the system as a symbol of the clarification of social values and official steadfastness in the face of a perceived threat to children will very likely prove to be a more important and fruitful arena for research, and in this we hope that future interest in AMBER Alert and similar child-protection legislation will be shown in the fields of sociology, social psychology, criminal justice, and political science.

5. Recommendations for improving the AMBER Alert system

Based on the research presented above, a number of recommendations can be made. Recommendations are made for improving the system, changing the design of Alerts, educating the public, and promoting research. It is important to note, however that these recommendations are speculative. Since research that specifically investigates the effectiveness of AMBER Alert is lacking, any recommendations must rely on theoretically similar, though not identical processes. For instance, it is recommended that Alerts be presented at times in which citizens (i.e., potential tipsters) are experiencing low cognitive load i.e., not busy thinking or doing other things. Traditional cognitive load studies indicate that memory is better under conditions of low cognitive load, as compared to high cognitive load. No cognitive load studies have tested memory for AMBER Alerts, however. Thus, the recommendation is based on an assumption that research in another area would apply to AMBER Alerts. Absent research, no strong policy suggestions can be made. Therefore, it is perhaps best to think of these recommendations as research hypotheses yet to be tested. Despite these shortcomings, policy recommendations based on related research are likely better than simply guessing at ways to improve the system. Years from now, it is hoped that there will be a plethora of Alert studies which will allow for more definitive, stronger recommendations.

5.1. Consideration of which situations warrant an AMBER Alert

The first recommendation for improving the system is to limit the number of Alerts issued to reduce the chances that they will overburden the system and bore the public (Fox, 2002). Although many people would argue that every abduction should receive national attention, this would overburden the system and tax the public's patience. Though it is difficult to make determinations about what cases "deserve" an Alert and which do not, it is suggested that they be issued in accordance to the Department of Justice guidelines and the purpose of the Alert system. Recent events have indicated that AMBER Alerts have been issued for situations beyond the guidelines and original purpose. For instance, in February 2006, an Alert was issued for a 27-year-old woman who was believed to be abducted (CTV.ca News Staff, 2006). In another example, an "AMBER Alert" system for the elderly has been adopted by several states and is being considered by the federal government (Schrager, 2006). Such a system would help recover seniors who have wandered away from assisted living facilities. While it was certainly an important goal to secure the safe return of all individuals, no matter their age, cases that deviate from the intent of the AMBER Alert system threaten to exhaust the public's attention and create AMBER fatigue.

Although it is a difficult recommendation to make, Alerts should be limited to stranger abductions, for which the system was originally designed. Two studies evaluating the content of Alerts found that about half of the abductions involved parents, and about a quarter involved strangers (Griffin et al., 2007; Hargrove, 2005). Alerts involving parental abductions not only have the potential to overtax the system, they also can have a negative impact on the public. Perceptions of crime severity can affect willingness to report, and the public may feel that parental abductions are not life-threatening events (and researchers such as Plass, Finkelhor, & Hotlaing (1995) agree that parents are not generally motivated to harm their child). Thus, the public may be less motivated to report, or even pay attention to Alerts.

The second recommendation for improving the system is to issue Alerts only when the quality of information is high. Simply put, Alerts should be disseminated only if there is quality information and pictures are available. If the description of the child, perpetrator or vehicle is too vague, or if the pictures are not recent or not clear enough, it

is unlikely that the Alert would be helpful in tracking down the perpetrator. Simply put, there would be little information that could be acquired into memory or retrieved at the appropriate time. A description of “a white middle aged man and a 10-year-old girl with brown hair” is not likely to be distinctive enough to prompt individuals to remember the information and look for such individuals. As research has indicated that having more information about an event makes it easier to remember the important details (Bluck & Li, 2001), it follows that having very little information in an Alert would make it difficult to remember enough details to facilitate recovery of the child. Similarly, if an Alert is released with little evidence that an actual abduction has taken place, an individual may dismiss the Alert by assuming that the child might have simply went to a friend’s house to play or some other innocent occurrence. Because previous research has shown that individuals are less likely to report a crime that is not perceived to be serious (Schneider et al., 1977), it is also likely that individuals are not likely to take note of a missing child unless there is clear evidence that something serious has happened. Thus, it is best that low-quality Alerts not even be issued as they will ultimately have a negative impact on the Alert system.

Next, Alerts should only be posted in close proximity to the abduction area. Alerts should be disseminated in a wide, multi-state or national area only in rare circumstances (e.g., if police have credible leads that the abductor will take child to a certain place). When people read about abductions that occurred in other states, they are unlikely to pay much attention. An individual’s feelings of personal relevance to such abductions would be quite low, as most people would likely assume that their chances of seeing the perpetrator or victim are very slim. Research supports this notion; Holbrook, Berent, Krosnick, Visser, & Boninger (2005) theorize that individuals cannot attend to all of the information in their surroundings. Thus, they must be selective in choosing what information to acquire into memory. Information that is personally relevant is more likely to be sought out, retained and recalled. Therefore, Alerts are likely most effective for individuals who feel that they are personally relevant (e.g., the child is abducted from a nearby neighborhood). For these reasons, AMBER Alert officials should be mindful of issuing too many Alerts. Although it is surely a tough decision, it might ultimately be the

best decision to refrain from issuing an Alert in some situations.

5.2. *Determine how to increase reporting of potential Alert sightings*

The next recommendation is to determine how to encourage reporting. This involves making sure the Alert reaches people most likely to see the perpetrator and child and then to report the sighting. It also involves studying who is most likely to report, and the conditions that encourage reporting.

The AMBER Alert system must focus efforts on people most likely to see the perpetrator and child (although a smaller focus would remain on alerting the general population). Alert officials would do well to target high-traffic businesses (e.g., gas stations or restaurants) and individuals who work in those businesses. One way to target such organizations would be to develop an AMBER Alert notification program involving these businesses. Alerts could be immediately faxed to participating businesses so that they may be posted for both employees and customers to see (Miller & Clinkinbeard, 2006). Focusing on these individuals is almost certainly a better expenditure of effort and time than trying to focus too much on groups that are less likely to see the perpetrator and child.

Similarly, research is needed to discover and address reasons people do not report. For instance, some individuals do not report because they have negative attitudes toward police. In order to counter this, perhaps the public should be provided with a phone number other than 911 or other police phone numbers. An Internet site could also be established to promote reporting without a direct interaction with police. In addition, the Alert should assure the public that their report is confidential and that the police will not contact them.

Future research will determine whether there are differential rates of reporting based on traits such as race, gender, or attitudes toward police. If so, Alerts could target the individuals who are more likely to report. For example, if research finds that individuals are more likely to recognize an abducted child who is of the same race, or if an individual is more likely to report seeing the child who is of the same race, then Alerts should be disseminated accordingly. If a Hispanic child is abducted, the Alerts would be

most heavily disseminated on Hispanic radio or television stations. Alternately, educational programs could be developed to encourage reporting (of AMBER Alerts and crime in general) among groups that are less likely to report.

Unfortunately, little is known about willingness to report Alert-related information. Most of the studies about helping behavior are laboratory studies (e.g., Gaertner, Dovidio, & Johnson, 1982), the help requested is a small gesture (e.g., giving change for a quarter), the person in need is an adult who is directly asking for help (e.g., Katz et al., 1975), and there is no antagonist causing the harm to the victim (thus, there is little risk to the participant if he chooses to intervene). Such situations are considerably different from helping in an Alert situation, which is a real world situation with larger implications (e.g., getting involved in a police investigation to possibly save a life), the victim is a child who is not directly asking for help, and there is an antagonist (a perpetrator) who might pose a risk to the helper. In addition, in most previous studies, the situation is fairly certain (e.g., one can easily imagine what happens when you give someone change for a quarter), however an Alert situation is not as certain (e.g., it is not as easy to imagine the events that will occur if one decides to report an Alert). Thus, the unknown risk may impede helping behavior.

Although there is a risk of creating a public that is too willing to report (and thus making false identifications), this risk seems less of a problem than underreporting. While unstudied, education could possibly help the public overcome such barriers. Such education efforts can address a variety of the limitations of the AMBER Alert system.

5.3. *Design better AMBER alerts*

When designing Alerts, it is essential that designers are mindful of cognitive architecture and working memory limitations, as presentation designs that do not consider such elements are likely to be less effective (Sweller et al., 1998). Careful design of Alerts will help the system work; if information is not presented in a way that can be remembered and recalled, it is essentially useless. The first recommendation is to consider the location of Alerts. Cognitive load studies suggest that AMBER Alert information should be presented during times that people are not busy doing other

things. While roadside signs may seem to be an obvious place to put Alert information, it is likely not the best place. Although not all drivers are under high load, those who are may be unlikely to remember the information. One alternative (or additional) place to put Alert information is in highway rest stop restrooms. Here, people are not under such demanding cognitive load and will be better able to attend to the information.

A final recommendation is to be mindful of the length and frequency of Alerts. Research has indicated that the likelihood of successful acquisition and later recall increases as the length of exposure increases (DiNardo & Rainey, 1991; Shapiro & Penrod, 1986). Further, repetition of the Alert can allow for more successful coding and less forgetting (Bluck & Li, 2001; Hannigan & Reinitz, 2000). Thus, any attempt to increase the amount of time and frequency to which people are exposed to Alert information, especially pictures, is likely to promote better encoding. A picture that is flashed on the news for many seconds during an Alert (perhaps during the entire time the details of the Alert are presented) is likely to be more successfully processed than a picture that is flashed for 1–2 s at the end of the story. Similarly, stationary signs are most likely to promote effective processing when they are located where people remain for several seconds or minutes (e.g., in public restrooms, in public transportation, in places where people stand in line). Seeing an Alert more than once can help ensure that it is remembered. However, as noted above, a delicate balance must be made to avoid overexposure, which could lead to AMBER fatigue. Further complicating this issue from a public policy perspective is that individual exposure to the various media sources of AMBER Alert widely varies; one man's ideal exposure level is another man's "AMBER fatigue."

Research should also determine the best format for Alerts. For instance, Alerts could be issued as "news" items or as "warnings" similar to weather alerts; research would determine which method of delivery is most likely to help individuals remember the Alert information. Other research would determine the proper length, wording, positioning and number of photographs, and other delivery details. Such research should focus on the identification of information delivery protocols that effectively facilitate encoding, retention, and retrieval of Alert information without contributing to

AMBER fatigue. Finally, the places that Alerts are posted should be tested. If research indicates that some methods used (e.g., roadside signs) are less effective than other methods (e.g., monitors in rest stops), then resources should be shifted accordingly. Such research would promote effectiveness and lead to positive changes. Such changes in Alert system messages have the potential to improve the chances of a successful outcome.

5.4. Determine how AMBER Alerts affect perpetrators

It would be extremely useful to know how the Alerts affect perpetrators. One purpose of the Alert system is to encourage abductors to release the child. On the other hand, there could be situations in which the publicity of an AMBER Alert makes some offenders more dangerous; research is needed to determine these situations. Similarly, research could determine whether Alerts prompt copycat crimes. Researchers could conduct interviews with perpetrators who were captured after committing murder in which there was an Alert issued to determine the effects of the Alert. Interviews could determine whether it was a copycat crime and whether they harmed the child sooner than planned because of the Alert (e.g., the precipitation effect). Of course, it is difficult to tell if the Alert system deters abductions, although a decline in child abductions after the implementation of the Alert system might provide some indication (though arguably a host of other factors also affect abduction rates).

6. Conclusions

The AMBER Alert system has been praised by the Department of Justice (2005). Although the system could be saving lives, it also has a variety of effects on the public and perpetrators. In return, psychological processes and decision-making affect the Alert system. Unfortunately, research concerning the Alert system is scarce or non-existent. While research on other areas is informative, it requires assumptions that may or may not be true. For instance, research on eyewitnesses of crimes may not hold true for eyewitnesses for AMBER Alerts. Research is desperately needed to determine whether the Alerts are presented in a way that the public can accurately remember and later

recall the information. Other research could determine whether they affect the behavior of perpetrators.

The list of recommendations is quite formidable. This is a result of so many unanswered questions about the Alert system. While the system's goals are laudable, there is the possibility that the system is largely ineffective or even has negative effects. Research is needed to determine the proper course of action. Such action could include making small or major changes to the delivery or design of the system. It could also include eliminating the system entirely if it is discovered that the costs outweigh the benefits. It is hoped that this article will serve as a starting point for many researchers who can test the ideas set forth; the result would be an abundance of studies specifically targeting the AMBER Alert system. These studies would directly inform policy and encourage informed policy-making.

References

- Associated Press. (July 28, 2005). *Web Kiosks to show missing kids*. Retrieved January 12, 2006 from <http://www.cnn.com/2005/TECH/internet/07/28/kiosks.missing.kids.ap/index.html>.
- Bachman, R. (1998). The factors relating to rape reporting behavior and arrest: New evidence from the National Crime Victimization Survey. *Criminal Justice and Behavior*, 25, 8–29.
- Batson, C. D., Elklund, J. H., Chermok, V. L., Hoyt, J. L., & Ortiz, B. G. (2007). An additional antecedent of empathic concern: Valuing the welfare of the person in need. *Journal of Personality and Social Psychology*, 93, 64–74.
- Beech, A. R., & Mitchell, I. J. (2005). A neurobiological perspective on attachment problems in sexual offenders and the role of selective serotonin re-uptake inhibitors in the treatment of such problems. *Clinical Psychology Review*, 25, 153–182.
- Berger, I. E. (1999). The influence of advertising frequency on attitude-behavior consistency: A memory based analysis. *Journal of Social Behavior & Personality*,

14(4), 547–568.

Best, J. (1990). *Threatened children: Rhetoric and concern about child-victims*.

Chicago: University of Chicago Press.

Bluck, S., & Li, K. (2001). Predicting memory completeness and accuracy: Emotion and exposure in repeated autobiographical recall. *Applied Cognitive Psychology*, 15(2), 145–158.

Cacioppo, J. T., & Petty, R. E. (1989). Effects of Message repetition on argument processing, recall, and persuasion. *Basic and Applied Social Psychology*, 10(1), 3–12.

CTV.ca News Staff. (2006). *Allegedly abducted Edmonton woman found safe*.

Retrieved June 14, 2006 from

www.ctv.ca/servlet/articlenews/story/ctvnews/20060226/amberAlert060226/20060226/?hub=Canada.

Department of Justice. (2004). *Report to the White House on AMBER Alert*.

Retrieved June 15, 2006 from

<http://www.amberAlert.gov/docs/AMBERWHReport.pdf>.

Department of Justice. (2005). *Attorney General Alberto R. Gonzales Marks National Missing Children's Day*. Retrieved August 16, 2008 from

<http://ojjdp.ncjrs.org/about/press/amber052005.htm>.

Department of Justice. (2006). *Attorney General Alberto R. Gonzales Marks National Missing Children's Day*. Retrieved August 16, 2008 from

www.usdoj.gov/opa/pr/2006/May/06_ag_326.html.

DiNardo, L., & Rainey, D. (1991). The effects of illumination level and exposure time on facial recognition. *Psychological Record*, 41(3), 329–334.

Eagly, A. H., & Crowley, M. (1986). Gender and helping behavior: A meta-analytic review of the social psychological literature. *Psychological Bulletin*, 100, 283–308.

Ebbesen, E. B., & Rienick, C. B. (1998). Retention interval and eyewitness memory for events and personal identifying attributes. *Journal of Applied Psychology*, 83(5), 745–762.

Fox, J. A. (August 17, 2002). *AMBER Alert's dangers*. Section A, New York Times, p. 11.

- Gaertner, S. L., Dovidio, J. F., & Johnson, G. (1982). Race of the victim, nonresponsive bystanders, and helping behavior. *The Journal of Social Psychology, 117*, 69–77.
- Greenberg, M. S., & Beach, S. R. (2004). Property crime victims' decision to notify the police: Social, cognitive, and affective determinants. *Law and Human Behavior, 28*(2), 177–186.
- Greif, G. L., & Hegar, R. L. (1994). Parents who abduct. *Family Relations, 43*, 1–9.
- Griffin, T., & Miller, M. K. (2008). Child abduction, AMBER Alert, and crime control theater. *Criminal Justice Review, 33*, 159–176.
- Griffin, T., Miller, M. K., Hoppe, J., Rebideaux, A., & Hammack, R. (2007). A preliminary examination of AMBER Alert's effects. *Criminal Justice Policy Review, 18*, 378–394.
- Hannigan, S. L., & Reinitz, M. T. (2000). Influences of temporal factors on memory conjunction errors. *Applied Cognitive Psychology, 14*(4), 309–321.
- Harder, K. & Bloomfield, J. (2003). *AMBER Alert Program prompts research on changeable message signs*. Retrieved August 16, 2008 from <http://www.cts.umn.edu/Publications/ResearchENews/2003/05/index.html#amber>.
- Hargrove, T. (2005). *False alarms endangering future of AMBER Alert system*. New York: Scripps Howard News Service.
- Holbrook, A. L., Berent, M. K., Krosnick, J. A., Visser, P. S., & Boninger, D. S. (2005). Attitude importance and the accumulation of attitude-relevant knowledge in memory. *Journal of Personality and Social Psychology, 88*, 749–769.
- Jenkins, P. (1998). *Moral panic: Changing concepts of the child molester in modern America*. New Haven, CT: Yale University Press.
- Karakashian, L. M., Walter, M. I., Christopher, A. N., & Lucas, T. (2006). Fear of negative evaluation affects helping behavior: The bystander effect revisited. *North American Journal of Psychology, 8*, 13–32.
- Katz, I., Cohen, S., & Glass, D. (1975). Some determinants of cross-racial helping behavior. *Journal of Personality and Social Psychology, 32*, 964–970.
- Loftus, E. (1977). Shifting human color memory. *Memory & Cognition, 5*(6), 696–699.

- Meissner, C. A., & Brigham, J. C. (2001). Thirty years of investigating the own-race bias in memory for faces: A meta-analytic review. *Psychology, Public Policy, and Law*, 7, 3–35.
- Miller, M. K., & Clinkinbeard, S. S. (2006). Improving the AMBER Alert system: Psychology research and policy recommendations. *Law and Psychology Review*, 30, 1–21.
- National Center for Missing & Exploited Children. (2005). *Wireless industry and National center for missing & exploited children commend Americans for demonstrating their commitment to reuniting abducted children with their families*. Retrieved August 16, 2008 from http://www.ncmec.org/missingkids/servlet/NewsEventServlet?LanguageCountry=en_US&PageId=2008.
- Piliavin, I. M., Rodin, J., & Piliavin, J. A. (1969). Good Samaritanism: An underground phenomenon? *Journal of Personality and Social Psychology*, 13, 289–299.
- Piquero, A., & Paternoster, R. (1998). An application of Stafford and Warr's reconceptualization of deterrence to drinking and driving. *Journal of Research in Crime and Delinquency*, 35, 3–39.
- Plass, P. S., Finkelhor, D., & Hotlaing, G. T. (1995). Police response to family abduction episodes. *Crime and Delinquency*, 41, 205–218.
- Schneider, A. L., Burcart, J., & Wilson, L. A. (1977). The role of attitudes in decisions to report to the police. In W. McDonald (Ed.), *Criminal Justice and the Victim* (pp. 89–113). Beverly Hills, CA: Sage.
- Schrager, A. (2006). 'AMBER Alert' for missing seniors advances in house. Retrieved June 14, 2006 from <http://www.9news.com/acmnews.aspx?OSGNAME=KUSA&IKOBJECTID=b31a8c98-0abe-421a-0072-f652a7b77437&TEMPLATEID=0c76dce6-ac1f-02d8-0047-c589c01ca7bf>.
- Shapiro, P. N., & Penrod, S. (1986). Meta-analysis of facial identification studies. *Psychological Bulletin*, 100, 139–156.
- Stafford, M. C., & Warr, M. (1993). A reconceptualization of general and specific deterrence. *Journal of Research in Crime and Delinquency*, 30, 123–135.
- Surette, R. (2002). Self-reported copycat crime among a population of serious and violent

- juvenile offenders. *Crime & Delinquency*, 48, 46–69.
- Sweller, J., van Merriënboer, J., & Paas, F. (1998). Cognitive architecture and instructional design. *Educational Psychology Review*, 10(3), 251–296.
- Thayer, S. (1973). Lend me your ears: Racial and sexual factors in helping the deaf. *Journal of Personality and Social Psychology*, 28, 8–11.
- Tonry, M. (2004). *Thinking About Crime: Sense and Sensibility in American Penal Culture*. Oxford, UK: Oxford University Press.
- Wispe, L. G., & Freshley, H. B. (1971). Race, sex, and sympathetic helping behavior: The broken bag caper. *Journal of Personality and Social Psychology*, 17, 59–65.
- Zaragoza, M. S., & Lane, S. M. (1994). Source misattributions and the suggestibility of eyewitness memory. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, 20, 934–945.
- Zgoba, K. (2004). The AMBER Alert: The appropriate solution to preventing child abduction? *The Journal of Psychiatry and Law*, 32, 71–88.