

Using Smart Card Technology to Prevent Sales of Alcohol to Minors

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Abstract

This paper describes a project examining the implementation and effectiveness of smart card technology (i.e., magnetic stripe) that is currently used on driver's licenses as a means to provide alcohol retailers with a simple, efficient, and reliable system for verifying the age of a customer as well as the authenticity of the identification. The overall objective of the system is to help prevent sales of alcoholic beverages to persons under 21 years of age so as to reduce alcohol-related problems among youth, particularly drinking and driving and alcohol-related crashes.

Introduction

Laws establishing a minimum age for the purchase, possession, and/or consumption of alcoholic beverages are intended to prevent young people from experiencing the negative consequences of excessive alcohol consumption. In particular, deaths and injuries resulting from alcohol-related motor vehicle crashes were a major impetus for the establishment of the 21-year minimum purchase age for alcohol in all states. And, these laws appear to have been effective (e.g., 1,2). Since 1985, the percent of 16 to 20 year-old drivers involved in alcohol-related fatal crashes in the U.S. has decreased from 35.5% to 21.5% -- a reduction of 39% (3). Nevertheless, the problem remains at unacceptable levels. In 1998, 1,669 drivers age 16 to 20 were involved in fatal crashes in which alcohol was present; a further 21,000 were involved in alcohol-related injury crashes. Despite the substantial decrease in the magnitude of the problem, there is room for further improvement.

In this context, the effectiveness of minimum purchase age laws depends on the extent to which they are successful in preventing underage persons from obtaining alcohol. Recent research in this area indicates that young persons not only continue to drink but experience little difficulty obtaining alcohol (e.g., 4,5). This research indicates that two of the most common methods of obtaining alcohol are from persons over 21 years of age and through the use of false, borrowed, altered or counterfeit identification. Enforcement programs, particularly those employing "sting" operations, have been shown to have a significant impact on underage sales (e.g., 4). However, enforcement is not a complete solution. Other approaches are also necessary.

To a large extent, the onus of compliance with minimum purchase age laws rests primarily with licensed providers of alcohol. The consequences of selling alcohol to someone who is not of age can be severe -- including loss of one's license to sell or serve alcohol. Hence, licensed sellers are charged with the responsibility of ensuring that alcohol is sold only to those persons who are of legal age.

Restricting the sale of alcohol to those persons who are of legal age presents a significant challenge to licensed providers of alcohol. Licensees must make a reasonable effort to determine that every person is of legal age before selling or serving them alcohol. Licensees and their employees are, therefore, responsible for determining (a) whether or not the identification validates the person's claim to being of legal age and (b) the authenticity of the document(s) presented. This can be a difficult and time-consuming task -- one for which many are unprepared.

Determining a person's age from an identification card (e.g., a driver's license) typically involves doing mental arithmetic with dates. This can be challenging for even the most numerically skilled. For many, the process is not straightforward and can take some time. In a busy store or bar with several other customers waiting, the person checking the identification may feel considerable discomfort and pressure to hurry. Employees may be too busy to check identification and when they do, it can be a superficial check at best.

Determining the authenticity of the identification can be even more difficult. As noted previously, among the most common means for young persons to obtain alcohol is through the use of altered, forged, and borrowed identification. To help alleviate the problem of bogus identification, many jurisdictions mandate that only certain pieces of identification can be used as proof of age when purchasing alcoholic beverages -- e.g., driver's license, military ID. But even these documents can be forged or altered. In many cases, an altered or forged driver's license can be difficult to detect on inspection.

Borrowed and/or expired identification can also be a problem. Some young people will obtain the old, expired license of an older sibling to use as false identification. Even though the license contains a picture of the individual, it is often possible for a person to resemble an older sibling to a sufficient extent that the identification can pass as legitimate. Licensees often fail to check if the license has expired. The card reader system, however, also checks the expiry date on the driver's license to help licensees detect minors using this approach in an attempt to purchase alcohol.

In summary, enforcing compliance with minimum drinking age laws can be a difficult task, the onus of which is placed on retailers, tavern owners and their employees. The providers of alcohol are expected to make a reasonable effort to ensure that alcohol is only sold to those who are of legal age. In response, young people have developed what seems to be an endless variety of novel schemes to circumvent the conscientious efforts of retailers and tavern owners to prevent sales to underage persons. Given that the consequences of the sale of alcohol to even one underage person can be devastating for the business, providers of alcohol require a simple, efficient and reliable system for checking a person's age as well as the authenticity of the identification presented.

An innovative approach: Using Smart Card Technology. In 1994, the Pennsylvania Department of Transportation began issuing a new style of driver's license that includes a magnetic stripe on the back. The magnetic stripe contains information about the individual (e.g., name, date of birth, license number, sex, and height) that can be used to facilitate information transfer and to enhance the security of the license. The Pennsylvania Liquor Control Board (PLCB) obtained the approval of the Department of Transportation to use the information

contained on the magnetic stripe driver's license in a system that would provide alcohol retailers with a means to determine the age of an individual as well the authenticity of the license to prevent sales to underage persons.

PLCB enlisted CommStar, Inc. to develop the hardware and software for the system. The result is a simple, easy to use system (called the MinorChecker[®]) that consists of a card reader and a microprocessor with a small printer. When a license is swiped through the reader, the software reads the information on the magnetic stripe to help licensees determine the person's age as well as whether the license is valid, expired or altered. The relevant pieces of information from the magnetic stripe are printed on a slip of paper for verification with that on the face of the license. A record of every transaction is recorded on disk.

This paper provides a preliminary report on the implementation of the card reader system in one community in Pennsylvania.

Method

The overall purpose of the study was to implement and evaluate the card reader system. The study design involved a comparison of three medium-sized communities in Pennsylvania. Licensees in one community received the card reader system along with an awareness and education program for both providers of alcoholic beverages and young people. One community received the awareness and education program but no card readers. The third community served as a control and received neither card readers nor awareness and educational programming. This paper reports only on the implementation of the card reader system.

The card reader system was implemented throughout the city of York, PA. Card readers were provided to 60 of the approximately 130 eligible licensed alcohol outlets in the city. These licensees were selected on the basis of their known or perceived likelihood of attracting a younger clientele. All six state-operated liquor and wine stores were included among the licensees provided with card reader units. Special workshops were held for licensees to instruct them in the use of the card reader system as well as to generate greater awareness and understanding of the need for a program to prevent sales of alcohol to minors. In addition, public awareness campaigns concerning underage drinking were conducted periodically.

As part of the process evaluation, interviews were held with licensees using the card reader system to determine the perceived benefits and limitations of the new system, its ease of use, problems with the system, changes in attempts to purchase by young people, other problems that might have arisen, responses of customers, and changes in business. In addition, records of all transactions using the new system were collected and examined to determine the frequency of use of the system as well as the recorded incidence of attempted purchases by underage persons.

The outcome evaluation will involve a comparison between the demonstration community and the other two communities in which the card reader system was not implemented. Several outcome measures will be examined: young driver traffic crashes involving alcohol; arrests for underage possession; and DUI arrests among young drivers. In addition, a compliance check operation was conducted using young-looking confederates who attempted to purchase alcohol in both the demonstration and control communities before and after the implementation of the

system. Focus groups were conducted with groups of underage drinkers in each community to determine their perceptions of the new system and their responses to it, particularly changes in where and how they might be obtaining alcohol.

This paper reports preliminary findings from the implementation of the card reader system including an examination of the electronic records of drivers' licenses that have been checked with the system.

Results

Approximately once per month, a member of the research team visited each of the licensees who possessed one of the card readers to download the records from all of the drivers' licenses that had been scanned since the previous download. These data provide a record of key pieces of information from every card scanned with the system.

Over the first 15 months of use, we obtained records from over 30,000 scanned drivers' licenses. After eliminating records of repeated scans within a few minutes of each other and those that were known to be the result of training and employee ID checks, there were 23,490 valid records for analysis. The frequency of use of the card reader varied considerably by licensee -- from a low of 1 scan to a high of 2,509. An examination of the overall frequency of use of the card reader revealed an initial increase over the first five months. Use of the card reader decreased thereafter.

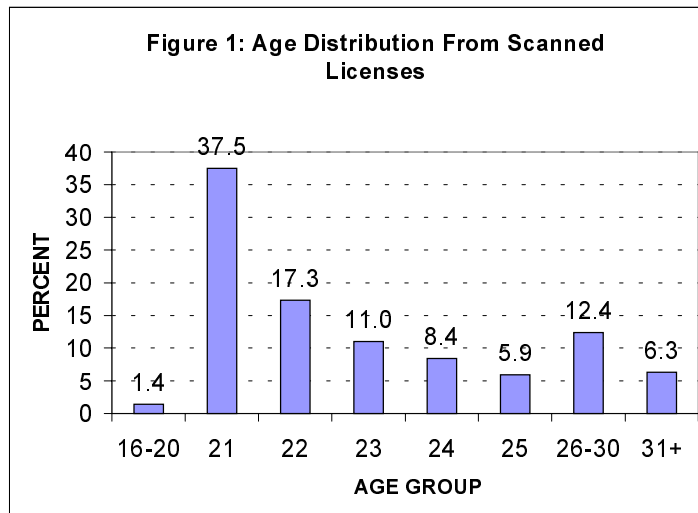
Of particular interest was the age of the person as indicated on the driver's license presented on the date it was scanned. The distribution of age is presented in Figure 1. The majority of licenses scanned indicated an age between 21 and 25. The percent of licenses scanned was highest among those 21 years of age (37.5%). The representation of each age decreased progressively with increasing age -- from 17.3% at 22 years of age to 5.9% at 25. Due to the small number of cases at higher ages, the final two age groups have been collapsed. This distribution of age indicates that the scanner is being used for the most appropriate age group of customers. It should be noted, however, that age was determined from the license, which may or may not have belonged to the person in possession of it.

This figure also reveals that it is relatively rare for a person to present a driver's license that reveals an age under 21. Only 1.4% of licenses scanned detected someone under 21 years of age.

There are several possible explanations for this finding. For example, persons under 21 years of age may be deterred from attempting to purchase alcohol at location in which a scanner is installed. Some licensees may detect an underage person prior to scanning the card and refuse service without scanning the license. It is also possible that when asked for identification, underage persons simply choose to walk away, knowing that the scanner will reveal their age.

Although the exact reasons for the small number of underage cases detected by the scanner are unclear, equally perplexing are the reasons why anyone would present a license that would show them to be under the legal age for purchasing alcohol. Some young people may be so bold as to present their ID hoping that the licensee will not check it closely. Given that underage status is clearly noted in red on the front of Pennsylvania driver's licenses, it is unlikely that this occurs often.

On the other hand, altering the information on the front of one's driver's license so as to make it appear that they are of legal age is not an uncommon practice among young people. However, regardless of how well these alterations are done, the information recorded on the magnetic stripe on the back of the license remains unchanged and will reveal the true age of the person.



In addition to checking the age recorded on the driver's license, the card reader system also determines if the license has expired. In Pennsylvania, an expired license is not considered to be valid identification. Just over 1% of all cards scanned revealed the license had expired. In two-thirds of these cases (67%), the age recorded on the license was between 21 and 25. Focus groups with underage drinkers revealed that using an older sibling's expired license is a common tactic. The value of this feature of the card reader is to detect expired licenses that may be used as false identification.

Discussion

Smart card technology provides retailers and servers of alcohol with the ability to quickly and easily determine the age of a potential customer as well as the authenticity of the identification by simply swiping the driver's license through a special card reader. Subjective judgment on the part of the clerk or server is removed. And, the potential for confrontation is significantly reduced as the responsibility for refusal of service can be attributed to a machine. By providing retailers and servers of alcohol with an easy-to-use, reliable and objective means of determining a person's age and the authenticity of the identification presented, many of the barriers to the routine checking of identification can be overcome. The use of this type of system, combined with a commitment on the part of licensees to check for proof of age on a routine basis, has the potential to have a significant impact on sales of alcohol to minors.

The data collected from the card readers over the first 15 months of use suggest it is being used with the most appropriate age group -- i.e., those 21 to 25 years of age. For a variety of reasons, underage persons are rarely identified. However, expired licenses are not uncommon, particularly those revealing an age in the 21 to 25-year age group. This may indicate the inappropriate use of someone else's license by an underage person.

The major difficulty experienced to date has been the apparent reluctance of licensees to use the card reader system consistently. The frequency of use data show that some licensees rarely used the system. Others were more systematic in its use. Interviews with licensees indicate that some either dislike or distrust technology and prefer to use their own judgment on whether or not to serve a customer. Some didn't understand how the system worked (even after training) and were reluctant to use it. Still others became frustrated when it didn't appear to work "properly" and simply gave up.

Also contributing to the problem of inconsistent use of the system was the constant changing of staff. Servers and clerks employed at licensed establishments tend to be a somewhat transient workforce. The ongoing influx of new employees and management required continual re-training in the use of the device. Among licensees, training employees in the use of the card reader system was often of low priority.

The most consistent users of the card reader system appear to be those licensees who have accepted their responsibility to prevent sales of alcohol to minors and have made a commitment to it. These licensees view the card reader system as a valuable tool that makes their job of checking identification considerably easier.

The key to the effectiveness of the card reader system as a means to prevent sales of alcohol to minors would appear to be consistent and routine use. This requires a commitment by management to the goal of selling alcohol only to persons who are of legal age. The card reader system alone cannot prevent all underage purchases of alcohol. It is, however, an innovative and useful tool to help achieve this goal.

Acknowledgement

This study was supported by the National Highway Traffic Safety Administration.

References

1. DuMouchel W, Williams AF, Zador P. Raising the alcohol purchase age: Its effects on fatal motor vehicle crashes in 26 states. Insurance Institute for Highway Safety, Arlington VA, 1986.
2. United States General Accounting Office. Drinking Age Laws: An Evaluation Synthesis of Their Impact on Highway Safety. Report to the Chairman, Subcommittee on Investigations and Oversight, Committee on Public Works and Transportation, House of Representatives. United States General Accounting Office, Washington, DC, 1987.
3. National Highway Traffic Safety Administration. Traffic Safety Facts 1997. Department of Transportation, National Highway Traffic Safety Administration, Washington, DC, 1998.
4. Preusser DF, Ferguson SA, Williams AF, Farmer CM. Underage access to alcohol: Sources of alcohol and use of false identification. Insurance Institute for Highway Safety, Arlington, VA, 1995.
5. Kusserow RP. Youth and alcohol: Laws and enforcement: Is the 21-year-old drinking age a myth? Department of Health and Human Services, Office of Inspector General. Washington, DC, 1991.