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Effects of Eye Imagery on Criminal Justice and Forensic Students Cheating in Online Testing

Kortni LaRue
klarue@stu.jsu.edu

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Candidate: Kortni Ridge LaRue

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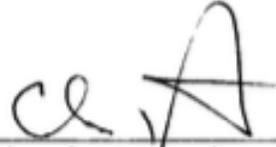   Students Cheating in Online Testing

Approval:

_____   __12 / 2 / 20__
Richards P. Davis   Date
Professor of Criminal Justice
Major Professor

_____   __11 / 30 / 20__
Kay E. Lang   Date
Assistant Professor of Criminal Justice

_____   __12/2/20__
Christopher Murtagh   Date
Assistant Professor of Forensic Investigation

_____   __12/2/2020__
Channing R. Ford   Date
Senior Director, Graduate Studies

EFFECTS OF EYE IMAGERY ON CRIMINAL JUSTICE AND FORENSIC

STUDENTS CHEATING IN ONLINE TESTING

A Thesis Submitted to the
Graduate Faculty
of Jacksonville State University
in Partial Fulfillment of the
Requirements for the Degree of
Master of Science
with a Major in Criminal Justice

By

KORTNI RIDGE LARUE

Jacksonville, Alabama

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Kortni Ridge LaRue   Date

ABSTRACT

Crime Prevention Through Environmental Design (CPTED) is a well-established subsection of environmental criminology in which aspects of the environment are altered in order to prevent crimes before they happen. This is primarily accomplished in two ways: physical and psychological. CPTED strategies often utilize both in order to prevent crime, but there is a lack of primarily psychologically based research in circulation. This includes the manipulation of the biopsychological response to gaze detection in order to increase prosocial behavior. Additionally, there is a lack of studies indicating if CPTED strategies are effective in a classroom setting and even less concerning online classroom settings. This research seeks to fill the void of psychologically based research as well as determine if CPTED strategies are effective through online classroom delivery by using eye imagery to influence cheating rates in online quizzes at a collegiate level. Results indicate that there is no significant association between eye imagery and cheating in criminal justice and forensic investigation students.

ix, 78 pages

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I INTRODUCTION

Cheating in a college classroom setting has numerous implications at both the academic level and the professional level, such as the propagation of underqualified professionals in the workforce (Dick et al., 2002). When cheating is viewed through a criminal lens, it opens a realm of crime prevention methods that can be applied in a classroom setting, including environmentally based crime prevention. This is changed further when the classroom is moved to a virtual setting, altering the parameters of cheating and requiring a more unique approach to curb cheating opportunities. Methods such as question and answer randomization and browser lock programs are common deterrents of cheating in online testing, but the lack of a physical environment should not exclude environmentally based crime prevention strategies from being applied to online testing. The goal of this research is to determine if there is a relationship between images and cheating in criminal justice and forensic investigation students in online quizzes.

This study seeks to expand upon the current body of research concerning eye imagery by implementing it in online college classroom settings to measure its effect on classroom cheating. This is largely based on Newman's model of natural surveillance as well as Jeffery's concept of social control exhibited through Crime Prevention Through

Environmental Design (CPTED). The psychological effects of eye imagery are illustrated

through research such as Haley & Fessler's (2005) and Bateson et al.'s (2013) indicating

that eye imagery can be an effective means for increasing prosocial behavior. Paired with

research that indicates that preventative measures can be effective in deterring cheating in

a classroom (Kerkviet & Sigmund, 1999), this signifies that one would expect the

introduction of eye imagery into an online classroom to decrease the occurrence of

cheating.

Environmental criminology focuses on the opportunity for crime and how the

physical environment factors into crime opportunities. One of the most prominent

theories to arise from this area is CPTED. CPTED is based on the idea that the

environment can be manipulated in ways that can prevent crime through both physical

means and psychological. In considering the body of research, there are numerous studies

based on the physical component of CPTED, but far fewer on the psychological

component. This research focuses primarily on the psychological aspects that can be

utilized through CPTED by studying the effectiveness of eye imagery that enforces social

behavior through the illusion of being watched.

While CPTED-focused research is plentiful regarding physical alterations to an

environment to measure the crime prevention effects, there is less in the way of eye

imagery and its effects as a psychological component of CPTED. Specifically, the current

research question is based on the psychological concept of gaze detection. Gaze detection

is a biological and psychological term developed to describe the functions involved in

detecting being watched and is considered vital in developing construal processes

(Adams & Kleck, 2003). Gaze detection not only facilitates social interactions but also

helps in the prediction of threats, which is illustrated through animals such as birds, reptiles, fish, and insects that have eye-like configurations to mimic larger animals, discouraging potential predators (Adams & Kleck, 2003).

As evident by the history of the field, CPTED is not a new and upcoming field of environmental criminology but is rather the culmination of a century of concepts, research, and theories. The utilization of eye imagery within the discipline of CPTED is also not a new concept, but its utilization has been primarily at the macro level, focused on flyer campaigns intended to discourage antisocial behavior in a broad audience. The psychological aspect of eye imagery within the scope of CPTED has been studied very little in respect to how the effects translate to a micro setting, such as in a classroom to deter cheating. Research such as Kerkvliet and Sigmund's (1999) has been performed in relation to cheating behavior in a classroom setting; it indicates that cheating is a prevalent issue that can be curbed through various in-class preventative measures. Studies such as those from Kerkvliet (1994) and Tittle and Rowe (1974) provide an experimental basis for this research in the administration of several self-graded quizzes to multiple college classes as well as the use of a survey to observe the students' opinions and feelings toward classroom cheating and their specific environment.

In addition to previous research, this research is largely based in several criminological theories. Lawrence E. Cohen and Marcus Felson's routine activities theory provides a framework for presenting cheating in the context of a crime, or as they refer to crime: a "direct-contact predatory violation" (Cohen & Felson, 1979, p. 589). Cohen and Felson's three minimal elements for a crime to occur are critical to understanding the criminal process, but especially in the realm of online academic cheating in that the

absence of capable guardians against a violation, one Cohen and Felson's three elements, is at the core of this research. In addition to routine activities theory, Derek B. Cornish and Ronald V. Clarke's rational choice theory also factors into this research. By examining cheating through the lens of rational choice theory, cheating can be explained in a way that indicates that students will act in their best interest even if it means cheating, just as criminals commit crimes that are most beneficial to them.

In light of the COVID-19 pandemic, opportunities to receive a traditional education within a classroom setting have been reduced, if not suspended for a time. The effects of moving education onto a fully online setting are not known yet, but research indicates that opportunities for cheating can be greater in online settings than in face-to face classrooms, with a decrease in direct observation and an increase in outside technology that can be used to aid cheating (Burgason, Ophir, & Briggs, 2019). Online education is a viable short-term solution to continuing education through times of natural disaster and health crises but deterring cheating may take many new forms through the online portal and will require further research in order to observe what is most effective. While this research design was altered due to the COVID-19 pandemic, it presented a unique opportunity to observe online cheating during a time in which online education is one of the few options for continuing education.

II LITERATURE REVIEW

The following literature review will delve further into the historical foundations of Crime Prevention Through Environmental Design (CPTED), the driving researchers behind CPTED strategies how these strategies can be translated into an online college classroom setting, similar research concerning cheating as well as eye imagery, and limitations of the current body of research concerning the use of CPTED in an online classroom setting in order to deter cheating. The overall goal of this literature review is to reveal how the application of CPTED-based strategies could be effective in an online college classroom setting and how research such as that proposed here can contribute to the current body of CPTED literature in a unique and useful manner.

Foundational Figures

While this research focuses on CPTED, it is important to trace the origins of CPTED back to the 1960s with Elizabeth Wood and Jane Jacobs in order to best appreciate the foundational concepts that have evolved into modern environmental criminology and CPTED practices. Wood began working in the city of Chicago as a caseworker for United Charities of Chicago in the 1920s, which exposed her to working directly with the low-income communities that lived in poor housing conditions (Booth,

2004). From these experiences, Wood transitioned her interests into housing activism, leading to her appointment as the first executive director of Chicago's Metropolitan Housing Council (MHC) in 1934. Wood summarized MHC's objectives with three focuses: "the enforcement of housing standards, the collection of housing statistics, and the development of neighborhood planning" (Booth, 2004, par. 10). By identifying neighborhoods in need of redevelopment, Wood set the basic foundation for environmental criminology as well as CPTED.

Jane Jacobs followed in the footsteps of Wood by heading an architecturally based safety campaign in New York in the 1960s. Jacobs entered into the realm of environmental criminology as a journalist in New York who morphed into a political figure after writing several pieces on current building projects within the city. Jacobs believed that these housing facilities seemed "neither safe, interesting, alive nor good economics for cities" (Jacobs, 1961, p. 459). Her 1961 book, *The Death and Life of Great American Cities,* examined the modern style of building and architecture in order to explain what exactly makes a city safe or unsafe and set the framework for future environmental criminological theories such as CPTED.

In order to maintain a society that keeps social problems in check—or, in other words, a city that maintains norms and regulations to a degree that limits unlawful activity—one must begin with what is already present, the environment that gives social problems the breeding ground to manifest and grow: cities (Jacobs, 1961). Jacobs (1961) observes that building cities in a way that makes the commission of crime easy would be nonsensical, yet this is what continues to happen. This single statement summarizes the goal of Crime Prevention Through Environmental Design, which is to prevent crime

before it happens and increase the public's general feeling of safety. Jacobs continues to lay the future framework for CPTED by outlining that keeping the peace in public areas is not done primarily by the police, but rather through "an intricate, almost unconscious, network of voluntary controls and standards among the people themselves, and enforced by the people themselves" (1961, p. 32). This concept is expanded upon by Jacobs through the examination of cities' main location of public space and human interaction: sidewalks.

Jacobs focuses on sidewalks and claims that "to keep the city safe is a fundamental task of a city's streets and its sidewalks" (1961, p. 30). While this subject may seem too benign to lend any foundation to further theories on crime prevention, Jacobs uses her discussion of sidewalks as a gateway to explain how the feeling of safety is intricately intertwined with city planning, structure, and building. She outlines three main qualities that sidewalks must have in order to maintain the sense of safety among an ever-changing group of strangers:

> First there must be a clear demarcation between what is public space and what is private space…
>
> Second, there must be eyes upon the street, eyes belonging to those we might call the natural proprietors of the street…
>
> And third, the sidewalk must have users on it fairly continuously, both to add to the number of effective eyes on the street and to induce the people in buildings along the street to watch the sidewalks in sufficient numbers. (Jacobs, 1961, p. 35)

Beyond their application to sidewalks, these three qualities are embedded within the basic concepts of CPTED, as well as within this research, most importantly the second concept of "eyes on the streets." When examining how this concept intersects with a college classroom setting, one can think of a classroom as a miniature neighborhood or social setting. A classroom is semipublic in nature in that actions performed within the classroom are observed by others in the room, and certain activities are not permitted in a classroom setting that would be permitted in a fully private space. As with most social settings, others within the room act as the "eyes on the street," as Jacobs refers to them, but differ in that these participants are consistent and do not change from meeting to meeting. A classroom setting also differs in that there is a different perception of watchfulness between classroom participants. The idea of a fellow student observing another does not have the same effect as when a professor observes a student.

Online classrooms differ even more so by removing the strongest aspects of physical classroom social control: the professor and fellow students. This research seeks to substitute traditional physical methods of observation with eye imagery in order to observe the influence that eye imagery has on cheating. By implementing eye imagery, this taps into both the literal and psychological interpretation of Jacobs' "eyes on the street" concept, which will be discussed in more detail later in this review.

Origins of CPTED

By viewing Jane Jacobs' *The Death and Life of Great American Cities*(1961)

through the lens of environmental criminology, it is clear that Jacobs illustrates the

beginnings of CPTED. Ten years after Jacobs' publication, C. Ray Jeffery took her

foundation and specifically expanded it into the criminal justice system of the United

States. His 1971 book, *Crime Prevention Through Environmental Design*, serves as the

origin of the concept. Jeffery delves into the United States' criminal justice system and

dissects each area in order to identify the shortcoming of the nation's system. His

argument is based on the belief that the United States' criminal justice system is largely

based on reactivity rather than proactivity. In this he means that the system is put into

place to address crime only after it has already occurred. The deterrence model is

observed in the police, the courts, and the prisons, revealing how little deterrence is truly

involved in the United States' model of justice. Jeffery then touches on Cesare Beccaria's

principle of certainty in the realm of criminal justice which states that in order for

deterrence through the police to be effective, punishment must be "swift and certain"

(1971, p. 53). This proves to often not be the case with punishment within the United

States, with apprehension rates being "too low to make the threat of punishment a viable

solution to the crime problem" (Jeffery, 1971, p. 64).

Jeffery also explains how the court system is also set up to be a part of the

deterrence model, but it has a limited reach in that of those apprehended, 50 percent of

cases are dismissed in some way, and as many as 90 percent of those charged plead guilty

and are barely touched by the court system (Jeffery, 1971). For those that do go through

the court system, the time between the commission of the crime and the determining of the sentence is so lengthy that the association between the two is lessened, in turn diminishing the deterrence effect on the criminal. The prison system is the final aspect of the criminal justice process of the United States that Jeffery discusses, which is the furthest from his proactive model. The prison system serves as the main deterrence factor for criminals but suffers from the previously mentioned issue of time in between the crime and the punishment, further made clear by high recidivism rates. According the U.S. Department of Justice, an estimated 68 percent of state prisoners released in 2005 were arrested again within three years, indicating that prison is not deterring criminals to the intended extent (Alpher & Durose, 2018).

If the present system of deterrence does not work, what can be changed? Rather than overhaul the current system of the police, the courts, and the prisons, Jeffery suggests a proactive approach of crime control through urban planning and design. Jeffery asserts that "man is a product of his environment" (1971, p. 214) and one can extend this logic to say that the crimes committed by man are influenced in part by his environment. He states that there are two ways to influence behavior through urban environments: physically (overcrowding, refuge, noise, and pollution) and socially (alienation, loneliness, dehumanization, and anxiety) (Jeffery, 1971). This research is predominantly focused on the social effects of environmental design. This will be done through the incorporating of Jacobs' "eyes on the street" concept with Jeffery's concept of social influences through environmental design. While Jacobs' concept embodies the physical approach of true surveillance through other people, the way in which it is mostly applied in this research is the nonphysical, psychological way that is more connected to

Jeffery's social effects. By incorporating eye images into an online classroom setting, the sense of being watched, even though purely manufactured, will alienate and cause anxiety in anyone attempting to break classroom regulations (cheating).

Defensible Space

A contemporary of Jeffery, Oscar Newman published his formative work, *Defensible Space*, in 1972; in it he examines housing facilities, as did Wood and Jacobs, and defines the effects of physical environment on the commission of crime (Newman, 1972). Newman's focus (1972) rested on the restructuring of residential environments in order for those sharing a common space to be able, and feel compelled, to control their own environment and its safety. While focused on housing facilities, it is within reason to assume that Newman's ideas can transfer to any public, occupied space and still maintain the same effect.

As defined by Newman, "a *defensible space* is a living residential environment that can be employed by inhabitants for the enhancement of their lives, while providing security for their families, neighbors, and friends" (1972, p. 3). Newman expands further on the meaning of employing an environment by stating that the correct physical design will enable residents to control their environment rather than become victims of it (1972). By utilizing architectural techniques, one can enhance an environment to feel more valued and more personal in order to foster a connection with its residents who in turn feel an obligation to not only physically take care of a location but also encourage more

surveillance for threats. Newman (1972) outlines four main tenets utilized to achieve this result: territoriality, natural surveillance, image, and milieu.

The first of Newman's key principles, territoriality, can be summarized as how one can demarcate between public and private property. Newman uses the example of a single-family house on its own land to demonstrate territoriality. Owning a home is viewed as a symbol of having an active role in a social system and represents to many the reaching of maturity and achieving success (Newman, 1972). This heightens their sense of responsibility to their society, which manifests in care for their neighborhood. As evident through Newman's interviews with public housing residents, there is a link between the expression of territorial feelings and strong concern for the maintenance of laws and the ability to enforce them (Newman, 1972). Additionally, through his study of cases such as Pruitt-Igoe in St. Louis, the Columbus Homes in Newark, and Van Dyke in New York, Newman identified that buildings with the least amount of transitional spaces from public to private consistently have the highest crime and vandalism rates, demonstrating its importance as a factor (1972).

While territoriality is not the focus of this research, the implementation of eye imagery could affect feeling of territoriality within the classroom. A physical classroom setting can be viewed as a small community of people (students) who all share the same goal: receive the highest grade possible for the class. This in itself can create the feeling of strong concern for abiding by the rules within that setting, but this aspect is reduced when a class is moved into an online setting. A student is most likely to be in a private location rather than a semiprivate classroom when taking an online quiz. Private environments have less social enforcement of rules and therefore could foster antisocial

norms such as cheating. Implementing eye imagery into the pages of an online quiz could combat the lack of social controls in an online setting and reduce cheating.

Natural surveillance is Newman's second key principle involved in defensible space and is the most prevalent within this research. Newman specifically defines natural surveillance as "the ability to observe the public areas of one's residential environment and to feel continually that one is under observation by other residents" while present within the defined area of residence (1972, p. 78). It is important to note that natural surveillance is placed second in Newman's list of principles in that its effectiveness relies heavily on functioning in tandem with territoriality. Research indicates that without any further influences, the ability to observe a criminal will not compel the observer to prevent the crime from occurring (Newman, 1972). The ability to observe must be paired with other influences such as the observer having developed a sense of personal and proprietary rights involving the area in observation, the identification of the event being abnormal within an area, and the extent to which the observer can alter the event (Newman, 1972). In other words, surveillance is not a cure-all but rather should be used as reinforcement to create effective crime prevention opportunities.

As mentioned previously, the idea of territoriality translates into the classroom setting through the sharing of a common goal: receiving a passing grade in the class. This gives substance to the idea of natural surveillance as defined by Newman in that there is a reason for the residents—in this case, students—to care about the enforcement of laws within the classroom, therefore encouraging their surveillance of others. This functions on a student–student basis, but also a proctor–student basis. The proctor of a classroom quiz presents a much stronger image of social control and enforcement of classroom

norms among those being observed. Once the primary aspects of rule enforcement (the proctor and fellow students) are removed, it is the goal of this research to observe if eye imagery is a sufficient form of surveillance to deter students from cheating in an online setting.

Newman's final two properties of creating a defensible space are highly interconnected and are in fact discussed together by Newman in a single chapter in his work (1972). These principles of image and milieu are similar even in their definitions, but their applications for environmental purposes reveal Newman's more nuanced interpretation of them. Image can be described as how one perceives an area. How image applies to environment can be viewed both in the macro and micro sense. In terms of housing facilities, aspects such as building height, project size, and road or traffic interruptions all contribute to the image of a facility (Newman, 1972). A majority of high-rise housing facilities are built to accommodate lower income families and as a result are built in small groupings of two to three buildings, which disrupts the cityscape and scale of the neighborhood it is placed in and often interrupts the flow of traffic in the area by sectioning off the entire complex of buildings to only be accessed by the residents (Newman, 1972).

At a micro level, image relates to the more common definition of the term. The image of a facility comes from the quality of the materials used in its construction and interior as well as the lifestyle implicated by from the building. As Newman points out, it has become a common practice of housing authorities to use vandal-proof and wear-resistant materials and furnishings in high-capacity housing facilities (Newman, 1972).

These cheaply priced materials are meant for minimal maintenance and upkeep but come at the cost of creating an institutionalized atmosphere, not unlike a hospital or prison facility (Newman, 1972). This environment does not invoke pride among the residents and instead provides them with a setting "that begs them to test their ability in tearing it down" (Newman, 1972, p. 105). The destruction of property within the building will then further create negative attitudes from residents, removing any sense of ownership or pride and perpetuating disrepair within the buildings.

Newman's idea of image can be loosely translated to that of a college classroom setting. In relation to proctoring an exam with students, it is expected for students to be monitored during the exam because the professor cares to enforce the rules of the classroom in order to maintain fairness. If the proctor leaves the room in which the exam is given, this indicates to the students that the proctor does not care, reinforcing the image that if the proctor does not care, then the students should not care to abide by the set rules and norms of the classroom, which will encourage cheating. This concept also translates to an online setting in that if an Honorlock system is not required or sufficient warnings are not given about cheating, students will default to using outside resources in an online class due to the lack of social controls present in an online setting.

The concept of milieu as set forth by Newman follows the traditional definition: "the physical or social setting in which something occurs or develops" (Merriam-Webster, n.d.). This does overlap with the idea of image but is differentiated by Newman in his example using a city setting. He posits that "if urban areas, streets, or paths are recognized as being safe, adjoining areas benefit from the safety in a real sense and also by association" (Newman, 1972, p. 108). This can be seen somewhat in a classroom

setting in that other classes that students are in operate under the same, if not similar,

rules and norms as set by the professor and university itself. Additionally, this also plays

off the idea that students expect to be observed in a classroom setting, especially while

taking an exam or quiz, which might make the students more prone to accept eye imagery

as a substitute for a standard proctor and behave according to social standards within an

online classroom.

Theoretical Foundation

Although CPTED-based writings are foundational for this study, this research is

also based on a number of similar environmentally based theories such as Cohen and

Felson's routine activities theory as well as Ronald V. Clarke and Derek B. Cornish's

rational choice theory. By grounding this research in tested theories, the academic

foundation can be solidified while the structure and methodology of this research can also

be strengthened and improved. It is important to note that while more than one theoretical

approach is discussed, routine activity theory and rational choice theory are equally

applicable to this study, and their combined usage helps cover a larger idea of criminality

in that using only one "cannot account for the full story" and limits the strength of this

research's theoretical foundations (Kroneberg & Kalter, 2012, p. 74). Both contribute to

environmentally based reasoning as to why crimes are committed and can be applied to

cheating in an online college classroom setting in a unique and largely unobserved way.

Cohen and Felson's routine activities theory (1979) is rooted in the circumstances

of the commission of crime rather than a focus on the offenders' characteristics. In

looking at the circumstances of crime, Cohen and Felson establish what they label as "direct-contact predatory violations" (1979, p. 589). They define these as illegal actions that intentionally take or damage the person or property of another (Cohen & Felson, 1979).

In defining what "direct-contact predatory violations" are, Cohen and Felson also established what they considered to be the three minimal elements for a violation to occur: "(1) motivated offenders, (2) suitable targets, and (3) the absence of capable guardians against a violation" (Cohen &Felson, 1979, p. 589). They emphasize that lack of any one of these elements would be sufficient for a crime not to occur (Cohen & Felson, 1979).While on the surface, cheating does not appear to fit the definition of a "direct-contact predatory violation" or even of a crime in general, it can indeed be viewed as a crime.

The first of these elements, motivated offenders, can be found in a classroom setting such as the one in this research. A motivated offender in the sense of this situation would be a student who desires a higher quiz score, a higher subsequent course grade that leads to a higher grade point average, and better job possibilities post graduation (Bunn et al., 1992). Tittle and Rowe's research concerning cheating found that "those [students] who were most in need of points were willing to take greater risks" (1974, p. 48). If a student wants a better grade but does not want to study, it would be sufficient motivation for performing a criminal act such as cheating (if the remaining two elements are also present).

A suitable target, the second element listed by Cohen and Felson (1979), could be restructured in order to be viewed as pertinent in cheating. A suitable target can also

mean a suitable opportunity to perform a criminal act, which would be cheating in this study. The suitable opportunity will be presented through the design of this research in that students will be able to retake the quiz after being shown the correct answers, despite not being told directly that this is allowed. This presents a suitable opportunity for cheating, especially in conjunction with the final element involved in a "direct-contact predatory violation," the absence of guardians.

Regarding the application of Cohen and Felson's theory in a classroom setting, the guardian role would fall to the professor or perhaps to a teaching or graduate assistant, but a capable guardian does not have to be a person. This role can be filled through any object that evokes the feeling of being watched, even if no one is physically watching. A "capable guardian" could be a security camera, a painting, or even a strategically placed statue. This research seeks to determine if eye imagery placed in an online classroom setting could function in lieu of a standard guardian. The effects of manufactured observation will be studied through the innately private environment that an online classroom provides with no social controls exhibited through a proctor or other students. Through this consideration of Cohen and Felson's routine activities theory, a framework can be deduced in order to properly measure the effects of manufactured observation in the standardization of the minimal elements required for criminal acts to occur.

Another important criminological theory involved in constructing this research is rational choice theory. This theory originates from Derek B. Cornish and Ronald V. Clarke, who presented a rational choice framework for criminal behavior (Cornish & Clarke, 2014). The core of their theory is the assumption that "offenders seek to benefit

themselves by their criminal behavior" and elect to commit criminal behaviors through a series of decisions and choices which all require some degree of rationality (Cornish & Clarke, p. 1, 2014). Cornish and Clarke further establish rational choice theory through making it crime-specific to accommodate the differing situational context of crimes, allowing for a more nuanced approach to understanding a criminal's decision process (Cornish & Clarke, 2014).

Cornish and Clarke delineate criminal behavior more so by defining two key aspects: criminal involvement and criminal events (Cornish & Clarke, 2014). Cornish and Clarke define criminal involvement as "the processes through which individuals choose to become initially involved in particular forms of crime, to continue, and to desist" (Cornish & Clarke, p. 2, 2014). The influences that are involved at this stage differ from those that are involved with the actual criminal event, with involvement decisions often being long, multistage, and an amalgam of varying influences that are not always related to the crime itself (Cornish & Clarke, 2014). Criminal event decisions are short-term and are derived more so from the immediate surroundings and circumstances (Cornish & Clarke, 2014).

In building on Cornish and Clark's theory, Ronald L. Akers (1990) focuses more on social learning theory and views rational choice as "a special case of general behavioral exchange or learning principles"(p. 656), but his explanation of rational choice theory provides a framework for how this theory can be applied to a classroom setting. This theory is rooted in the idea that human actions are based on rational thought processes and decisions (Akers, 1990). This presumes that people commit crimes based on their informed understanding of the probable consequences of their actions, as

predicted in Becker's 1968 research (Akers, 1990). This can be simplified further as how a person's acts are based on a reward-and-cost balance for each action (Akers, 1990).

There are three main dimensions that Akers (1990) describes as important to take into consideration when viewing crime through the lens of rational choice theory: the "rationality" of criminal acts and careers, the actual or perceived balance of reward and costs associated with committing crime, and the background and other relevant variables. These dimensions are interconnected and function together to form the process of rational decision making. In viewing classroom cheating through a rational choice perspective, it is a relatively minor form of crime being committed, so the rationality of it is easy to follow: A student needs a better grade in order to pass the class, so the logical jump to cheating as a means to make a better grade is rational in the sense that it is a solution that has a higher reward than the risk's cost most of the time.

The idea of instant gratification also factors into this dimension of rational choice. Instant gratification has been observed as a critical element in explaining criminal and antisocial behavior (Hayward, 2007). As applied to a classroom setting, instant gratification can be seen as the ability to cheat rather than spend time prior to the quiz studying in order to receive a passing grade. This decision appeals to those students with less self-control and therefore appears more rational to them.

The second dimension of rational choice theory, the actual or perceived balance of reward and costs associated with the commission of a crime, is the core aspect of this theory and has its roots in Jeremy Bentham's ideal that "man in his actual behavior strives after pleasure and shuns pain" and that "men's acts are governed by self-interest, making for the acquisition of personal pleasure" (Brunius, 1959, p. 74). The decisions

made based on this axiom of weighing the pleasure against the pain of an action is what

makes an act seem rational to an individual. In this way, the dimensions do not function

as separate elements; rather each builds the foundation for what constitutes a rational

decision.

Lastly, background and other relevant variables encompass all other variables that

can factor into performing criminal acts that are specific to each crime. In the case of

cheating, other variables such as observing others cheating, moral attitudes toward

cheating, lower grade point average (Bunn et al., 1992), low practice times, test anxiety,

and heightened temptation to cheat (Malinowski & Smith, 1985) all fall into the category

of background variables that would factor into why students cheat.

Practical Applications of CPTED

Environmental criminology extends from theoretical ideas to direct, practical

applications. While many of the founders and researchers who led the way for CPTED

practices were more focused on residential areas, this does not limit its effectiveness to

only housing. Timothy D. Crowe and Randall I. Atlas both pioneered the standardization

of CPTED practices. Both built upon the foundation that Jeffery and Newman created

and introduced CPTED's viability to areas outside of housing such as places of business,

public parks and streets, and schools. Crowe's *Crime Prevention Through Environmental

Design* (originally published in 1991), ushering in the standardization of CPTED

principles. Crowe (2013) states that one can alter the physical environment in order to

produce behavioral effects that then result in a reduction in the propensity for criminal

behavior within that area. Crowe then amalgamates both Jeffery's and Newman's environmental concepts into what he deems to be the three core CPTED strategies:

1. Natural access control

2. Natural surveillance

3. Territorial reinforcement (2013, p. 27)

While all three are important, only natural surveillance and territorial reinforcement play vital roles within this research. Both concepts are similar, if not identical, to Newman's concepts of territoriality and natural surveillance. As Newman pointed out, Crowe also establishes the interconnectedness of surveillance and territoriality. With increased surveillance (and natural access control) comes a heightened sense of territoriality that will compel those in the area to report and react more to criminal behavior as well as increase their general security awareness (Crowe, 2013). This is important to note in that a heightened sense of territoriality through increased surveillance can indicate to potential offenders that they are at risk of being seen and identified (Atlas, 2008). This research seeks to expand upon this idea and examine the effects through a manufactured sense of being watched.

In addition to providing the practical application of CPTED through the three core strategies, Crowe and Atlas also provide a concrete approach to addressing environmental issues through CPTED: the "Three-D" approach. This approach considers the designation, definition, and design of the space in question and provides practitioners a framework for considering which strategies will work best (Crowe, 2013). By using this approach, we can better understand why CPTED strategies such as introducing simulated observation can be applicable and effective in an online classroom setting.

The designation of a location can be determined by defining its purpose (Crowe, 2013). The college classroom setting's purpose is to contain students and a professor in order to conduct class as well as proctor quizzes and exams. This designation is clear in this situation due to the location of the classroom within a college building within the campus. The definition of the college classroom setting is determined by looking at the defined borders of the area, clear ownership, legal or administrative rules set for the location, social definitions assigned to the location, and signage within the area (Crowe, 2013). The defined borders of a classroom are made self-evident due to the room's walls. The ownership of the classroom is interesting to consider in that the classroom itself is owned by the university, but the temporary ownership of the classroom changes with each class held within the room. From the perspective of who has control over the classroom while inside it, the professor possesses a temporary ownership over the classroom. Online classrooms lack this type of designation, and the addition of eye imagery in a quiz could help combat this absent designation.

The administrative rules for a college classroom are again mainly set by the university but to some degree are also defined by the professor on a class-to-class basis. The most prevalent set of rules that are applicable to a classroom setting is that of a university-set honor code concerning cheating, which will influence the likelihood of detection and the severity of punishment (Kerkvliet, 1994). This honor code is applicable to all classes at the university, no matter the subject, and is expressed in every syllabus handed out per university policy. This is a consistent baseline for all university students to know what the punishments are for cheating. Where things could differ from classroom to classroom will be the rules each professor enforces. These could include

additional preventative measures against cheating such as giving multiple test versions and spacing students out physically within a classroom (Bunn et al., 1992). When applied to an online classroom, these legal and administrative rules remain largely the same but require more detailed outlining on the online platform. Additionally, online classes lack the ability to prevent cheating through physical measures such as spacing students out and physically proctoring the quizzes but do possess the ability to randomize question order on quizzes and require an Honorlock system to be used while testing. These measures will be minimized in order to better evaluate the effects of eye imagery placed on the quiz on online cheating.

Social definitions as set within a classroom setting can be viewed through the lens of CPTED as well. The classroom is a semiprivate space with its clearly defined borders and limited public access. Only specific people are allowed within the classroom, but social norms still exist in which particular behaviors are prohibited. These are in part determined and enforced by the legal rules because cheating is considered wrong, but as demonstrated in the research performed by Bunn at el. (1992), students' social norms differ from these legal norms, and most students do not consider cheating to be a serious issue. An online classroom setting again lacks the enforcement of social norms via other persons in the classroom, so the addition of imagery to online quizzes will help enforce social definitions that are absent.

Biopsychology of Being Watched

As mentioned previously, this research focuses on the psychological component of CPTED described by Jeffery (1971) as social influences of an environment. This component includes feelings of alienation, anxiety, dehumanization, and loneliness produced by the surrounding environment (Jeffery, 1971). While there are both biological and psychological studies that indicate that the feeling of being watched can induce these feelings, which then can lead to more prosocial behavior, there is a lack of research in the area of how this aspect of environmental design can be implemented to decrease antisocial behavior (cheating) in an online college classroom setting.

Biologically speaking, great importance is placed on the concept of gaze detection in that eye contact is a tool that animals utilize in order to help predict threats (Adams & Kleck, 2003). Gaze detection is applied in both biological and psychological realms, encompassing the neural functions involved in detecting being watched, and is considered vital in developing construal processes (Adams & Kleck, 2003). Gaze detection is seen at the biological level where animals have developed markings that resemble eyes on their backs in order to ward off predators, such as those observed on birds, reptiles, fish, and insects (Adams & Kleck, 2003). This has been further tested in Botswana where a biologist has experimented with painting eyes onto cows in order to deter lion attacks on farms (Tennenhouse, 2016).

While gaze detection is critical for the survival of most animals, it is also important for humans. Visually, the human face is the most important stimulus that humans process every day, with the eyes playing the most important role in this process

(Itier & Batty, 2009). The eyes are central to forming social connections and play a "fundamental role in social and non-verbal communications" (Itier & Batty, 2009, para. 2). This helps individuals regulate turn taking in conversations, express emotions, and exercise social control, the most central to this research (Kleinke, 1986). This regulation is made possible due to mechanisms within the brain that are specifically built for facial recognition.

Research results suggest that humans possess a specialized neural system that is specifically designed for perceiving others' eyes along with the direction of the gaze (Batki et al., 2000). Research performed by Batki et al. (2000) was primarily performed on newborn babies in order to measure their reaction to faces with their eyes open or closed. Contrasting research claims that newborns are not reacting specifically to the presence of eyes but rather "to any face-like pattern in the visual field" (Batki et al., 2000, para. 3). This is disproven through their findings that newborns do appear to be searching for eyes in another human's face, as it was measured that the babies preferred to look at the face with open eyes than the face with closed eyes (Batki et al., 2000). This indicates that humans are attuned to the presence of eyes in a biological sense even without certain socialization techniques, providing a biological framework for this research involving manufactured observation in an online classroom setting.

In addition to human brains possessing neural networks that are designed to recognize other human eyes, the same networks can recognize the direction of the gaze (Batki et al., 2000). This is important because gaze direction connects to emotional display and communicating emotions (Itier & Batty, 2009). Direction of gaze can further emphasize an emotion on display, and research has suggested that in some cases, direct

gaze can increase the speed at which the displayed emotion is shown (Itier & Batty, 2009). This aspect of the eye-centric neural network within humans indicates that the watchful imagery selected for this study must be done so while keeping the emotional connotation and direction of the gaze of the eyes in mind.

It is clear that gaze detection is an important biologically rooted function within the human brain, but gaze detection also factors into a psychological component of enforcing social control (Kleinke, 1986). More specifically, gaze detection plays a vital role in norm psychology, a subgenre of psychology that focuses on the "inferring, encoding in memory, adhering to, enforcing and redressing violations of the shared behavioral standards of one's community" (Chudek & Henrich, 2011, p. 218). Norm psychologists differentiate two types of norm behavior: injunctive and descriptive (Bateson et al., 2013). Injunctive norms are actions that are almost universally accepted and approved of, while descriptive norms are what most people actually do (Bateson et al., 2013).

It is important to differentiate the types of norm psychology due to the nature of cheating in classrooms. While not cheating may appear to be an injunctive norm, research indicates that cheating may fall more under the realm of descriptive norms. As discussed previously, while a classroom of students expressed agreement that cheating is wrong, 70 percent were found to have copied sections of their written paper from another source (Murdock & Stephens, 2007). This indicates that there is a degree of dissonance between the injunctive and descriptive views of cheating. Cheating seems to be generally agreed upon as wrong, but students still perform an overwhelming amount of cheating in the classroom despite its antisocial label. This dissonance might be combatted by stronger

classroom social controls in which watchful imagery would be installed to promote less cheating, seeing as research by Bateson et al. (2013) found that their "watchful eyes effect" induced more prosocial behavior than normative behavior.

In addition to norm psychology, the reputation-based partner choice model can explain an increase in prosocial behavior when someone feels as though they are being observed. This model takes into consideration that humans are inherently prosocial and without the promise of immediate reciprocation, they will continue to act prosocially as an investment of sorts in their social reputation, which will in turn increase favor among others when performing mutually beneficial interactions (Bateson et al., 2013). This is interconnected with the idea of norm psychology in that observation increases individuals' prosocial behavior due to the reputational repercussions of their actions (Bateson et al., 2013). An alternative view of this model of human interaction is called "competitive altruism," in which prosocial behavior is maintained while under observation because cooperative people are viewed as better partners in both business and personal interactions (Sylwester & Roberts, 2010). Regardless of which interpretation of human interaction is used, one can manipulate humans' hyperreactivity to being watched through the use of artificial observation to induce compliance with prosocial behavior.

Research has also been performed with a focus placed on what is referred to as social presence and its effects on human behavior. This is another reformulation of the previously discussed research in which social presence (subtle cues of being watched) is used to observe its influence on human interactions while in social settings (Keller & Pfattheicher, 2010). Keller and Pfattheicher (2010) also integrate how social presence and reputation are interconnected. They observed that social presence increases cooperative

behavior in individuals, which was specifically represented through an increase in anonymous donations within the context of their research (Keller & Pfattheicher, 2010). Additional research supports social presence; social presence introduced in an anonymous economic game was found to not increase the amounts transferred in single transactions. Rather, it increased the number of participants who transferred funds at all (Haley & Fessler, 2005). This indicated that social presence can produce the same psychological effects as being actually watched in that participants exposed to social presence will act accordingly as though their reputation will be affected despite the social presence being manufactured.

Previous research has tested the psychological aspects of social presence and the use of eye imagery to simulate the feeling of being watched. Bateson et al. (2006) used an anonymous coffee shop donation box in order to test the influence of eye imagery. By placing signs over the donation box in the shop, Bateson et al. (2006) determined whether eye imagery was more likely to influence patrons of the shop to act more prosocially (specifically, make a donation). They found that the eye imagery was effective at increasing the amount of donations made as compared to when a sign was used that contained only the image of flowers (Bateson et al., 2006). This research is similar to other studies concerning eye imagery and cooperative behavior in that there is much research performed with anonymous, online "games" where the participant allocates funds or goods to others who are not seen (Haley & Fessler, 2005; Sylwester & Roberts, 2010; Oda et al., 2011 However, research by Bateson et al. (2006) is more effective as it maximizes "real-world context where participants were behaving naturally and using their own money" (para. 7). Their findings translate to the online classroom setting of this

research as students typically have less supervision when taking an online quiz as compared to taking a quiz in a full classroom, so the use of eye imagery in online testing could act as a substitute for the sense of watchfulness normally found in a classroom setting, resulting in more natural, prosocial behavior from students.

Similar research was performed by using posters with eye images in order to influence littering behavior in a university cafeteria (Ernest-Jones et el., 2011). This study found again that eye imagery is effective in producing more prosocial, cooperative behavior (Ernest-Jones et al., 2011). While this does reinforce what Bateson et al. (2006) determined, Ernest-Jones et al. (2011) did produce more specific findings: The posters containing eye imagery were more effective when there were less people physically in the cafeteria at the time. This leads to the idea that the effectiveness of eye imagery can be maximized in situations where the field is not oversaturated with observation already, such as the area of study in this research, online classrooms. The online quiz instructions (see Appendix B) indicate for students to take the quiz with no outside help from others, therefore maximizing the potential effects of the eye imagery.

In moving to a more centralized example of previous research, Nettle et al. (2012) integrate the previously discussed psychological potential of eye imagery with CPTED concepts in order to intercept crime before it happens. This study is similar to the previous examples in that signage with eye imagery was posted outside of three areas of a university that had documented high bicycle theft rates (Nettle et al., 2012). This research expands upon the previous two studies in that theft is more of crime than contributing to an anonymous donation box or littering but does find the same results: Eye imagery does increase prosocial behavior. As discussed in the following sections, academic cheating

can be viewed as a form of theft, and research performed by Nettle et al. research (2012) indicated that eye imagery could be effective in deterring cheating.

Research such as Bateson et al. (2006), Ernest-Jones et al. (2011), and Nettle et al. (2012) all illustrate the possibilities presented when the psychological idea of social presence is combined with the enforcement of prosocial behavior, setting the framework for the application of similar tactics in a classroom setting, as found in this study.

Cheating as a Crime

Crime in the classroom is an understudied area of crime in that the results are not physically harmful, so less attention has been paid to this area. Cheating as a crime is prevalent within a college setting, with 50 to 70 percent of university faculty members stating that they have observed cheating in their classroom, and 30 to 70 of those faculty consider it a serious issue (Kerkvliet, 1994). Additional research indicates that while one classroom of students expressed strong opinions that cheating is wrong, almost 70 percent of students in the same classroom had lifted portions of their papers straight from uncited research (Murdock & Stephens, 2007). Research performed by Dick et al. (2002) indicates that an average of 75 percent of students reported cheating at some point in their college career. This illustrates that while students consider cheating to be morally wrong, it is not considered wrong enough to deter students from doing it. These data, paired with the findings from Bunn et al. (1992) that students do not consider cheating to be a serious crime, displays the importance of further research into effective preventative measures that can be implemented with relative ease.

In framing cheating through an academic lens of study, Dick et al. (2002) proposed a three-stage process by which cheating can be described. They label the stages as pre-empting cheating, detecting cheating, and responding to cheating (Dick et al., 2002). Pre-empting cheating is defined as methods that "reduce the incidence of cheating…prior to the assessment of work" (Dick et al., 2002, p. 172). Detecting cheating refers to discovering cheating after work has been submitted as well as monitoring exams, and responding to cheating is defined as how academics respond to cheating when it is detected (Dick et al., 2002). When considering online cheating, the pre-empting of cheating is the focus of this research in that it is the most applicable to quizzes and multiple-choice questions.

Bunn et al. (1992) define crime through the agents involved. The first agent discussed is a legal entity that must set and regulate laws that establish property rights, and the second is who enforces the law, often the police in most criminal situations (Bunn et al., 1992). The criminal is the agent who breaks or goes against these laws. Additionally, Bunn et al. (1992) follow the economic model as applied to crime, as seen in rational choice theory. This is to say that criminals view an opportunity to commit crime based on the "expected costs and benefits of committing those acts" (Bunn et al., 1992, p. 198). As in rational choice theory, it is assumed that a rational criminal compares the costs and benefits of a crime and bases their actions on that (Bunn et al., 1992).

Interestingly, there is an additional interpretation of cheating as crime from Franklin G. Mixon, Jr. (1996) in which he discusses cheating as a form of a public goods issue. Mixon (1996) argues that cheating represents a victimless crime in that the victim

still has the answers, but the cheater is benefitting from their answers by free-riding off of information they did not originally have. This results in the underproduction of knowledge, which represents a criminal act within the production expectations of a classroom and a university.

In their research concerning classroom crime, Bunn et al. (1992) likened cheating to the crime of theft. The laws prohibiting crime (i.e., cheating) in a classroom setting would be set by the university through an honor code, and as each honor code varies, so does each professor's enforcement of such honor code (Bunn et al., 1992). Additionally, those who act as the enforcers of the honor code are not only the direct agents of the university, the professors, but also other students, and the criminal is the cheating student who is taking information from prohibited or illegal sources (Bunn et al., 1992). This application of crime as described in a college classroom setting will be the one our research will maintain as its criminological premise.

In addition to the legal implications involved in cheating, there are also unintended effects in the professional realm as well. As noted by Dick et al. (2002), the issue of students who continually cheat, are not caught, and graduate leads to the proliferation of incompetent and underqualified professionals in the field. This in turn causes damage to society, to the chosen profession of the student as a whole, and to the reputation of the institution and its degree (Dick et al., 2002). In addition to the harm done to society, Dick et al. (2002) also list a secondary area of harm: the academic environment. This is due to the increased time spent controlling cheating rather than creating a positive learning environment (Dick et al., 2002). Students who cheat harm themselves, as mentioned before, by depriving themselves of knowledge needed to be

properly prepared for their profession, but they also harm noncheating students as well in that cheating students have an unfair advantage over honest students (Dick et al., 2002). In considering the problems that can come from student cheating, it is important for research such as this study to be performed in order to elucidate what preventative and preemptive measures can be applied effectively in an online environment to deter cheating.

Cheating in the Classroom

There is considerable research performed on the subject of cheating in a classroom setting, as well as specifically within a college setting. This research varies in focus with some observing if cheating can be effectively controlled (Kerkvliet & Sigmund, 1999), classroom cheating economics (Bunn et al., 1992; Mixon, 1996), self-graded quizzes with survey companions (Tittle & Rowe, 1974; Nowell & Laufer, 1997), and stand-alone surveys on cheating (Kerkvliet, 1994). In general, research on cheating is challenging to accomplish and requires creative ways to invoke control over the classroom, which is amplified when moving to an online class setting.

To begin the discussion on cheating, one might ask: Is it feasible to deter cheating in any meaningful way? Based on research done by Kerkvliet and Sigmund (1999), the answer would be yes, cheating can be controlled in the classroom. Kerkvliet and Sigmund's study (1999) presents a comprehensive examination of cheating behavior in the classroom as well as how information is gathered on classroom cheating. They break down research on academic cheating into four methods: direct but surreptitious

observation, the error overlap method, direct questions, and randomized response

questions (Kerkvliet & Sigmund, 1999). Direct observation is done through methods such

as self-graded quizzes that have been graded before yet not marked (such as in Tittle and

Rowe's research in 1974), while the error overlap method statistically compares the

incorrect answers of adjacent students with the incorrect answers of randomly chosen

students (Kerkvliet & Sigmund, 1999). The other two methods involve surveys; the direct

method uses direct questioning of cheating behavior, while randomized response surveys

allow for more anonymity and encourages more truthful answers (Kerkvliet & Sigmund,

1999). All four have their faults, but the direct observation method is the most conducive

to accurate answers, even more so in an online setting in that retaking a quiz in order to

take advantage of the correct answers being given after the first attempt can be easily

recorded and observed from an instructor's standpoint in the online class module. While

Kerkvliet and Sigmund's research (1999) focused on in-person cheating behaviors, their

finding that deterrents to cheating are effective lends creditability to the possibility that

cheating deterrents can work in an online setting as well.

As mentioned in Kerkvliet and Sigmund's (1999) research, Tittle and Rowe's use

of self-graded quizzes in their 1974 study was a large inspiration for this research. While

their research was strictly based on in-person classrooms, slight modifications were made

in order to transfer the study to an online setting. These modifications primarily involve

the self-grading process. Due to the nature of online testing, quizzes can be graded

automatically through the testing system (Canvas). In order to produce an opportunity for

cheating that was similar to Tittle and Rowe's self-grading opportunity, the online

quizzes were set to allow for multiple attempts by the students. There were no specific

instructions indicating that the quiz should be taken more than once, therefore leaving

enough opportunity for what could be considered a form of academic cheating.

III METHODOLOGY

This section clarifies the purpose of this research and how the research was performed in order to best illustrate if applying Crime Prevention Through Environmental Design (CPTED) techniques in an online classroom setting is effective in deterring cheating. This quantitative research was conducted in order to observe whether eye imagery is effective in deterring cheating in an online college classroom setting. The students selected took one quiz each, with one portion of courses having no image added to their quiz, one portion of courses having a neutral image added to their quiz, and the last portion having an image of eyes added to their quiz (see Appendix A). Data were collected from student quiz attempts on the online education platform, Canvas. Instructions did not indicate that the quiz must be only taken once but also did not discourage students from taking it more than once. Correct answers were displayed after the first attempt. A question was included that was designed to be exceptionally difficult in order to increase the probability that students would attempt to improve their score by retaking the quiz. The number of quiz attempts made by students in order to improve their score indicated whether placing eye imagery on the quiz page affected the rate of cheating.

Questions/Hypothesis

Research Question

Is there a relationship between images and cheating in criminal justice and forensic investigation students in online quizzes?

Null Hypothesis

The variables "eye imagery" and "cheating" are independent.

Alternative Hypothesis

The variables "eye imagery" and "cheating" are dependent.

Variables/Definitions

Independent Variable

Type of imagery placed on the quiz instructions and questions (eye imagery, neutral imagery, no image)

Dependent Variable

If "cheating" occurred (yes, no)

Sample Selection

In order to select the sample from the target population, purposive sampling was used. This form of nonprobability sampling was used in order to ensure that the classes

selected were large enough to generate an appropriate sample size as well as allow for the

judgement of class size and professor participation to be incorporated into the selection

process (Bachman & Schutt, 2016). Rubin and Rubin (1995) suggest three guidelines for

selecting purposive sampling participants: knowledge of the situation/area of study,

willingness to talk, and representative range (as cited by Bachman & Schutt, 2016). All

selected professors had working knowledge of criminal justice, and more importantly for

the purpose of this study, working knowledge of how to administer the quiz through the

online learning platform of Canvas. All selected professors also were willing to

participate in the research. While purposive sampling is often performed via interview

and requires participants to talk with the researcher, in this case it translates more to

professors being willing to administer the quiz to their class. Lastly, selecting two

professors from each area of the criminal justice and forensic investigation department

increased the likelihood of the sample being representative of the population of this

study.

　　　　Four professors were selected: two criminal justice professors and two forensic

investigation professors. Each professor was selected based on their number of classes

taught and the size of the classes taught. The professors selected each taught a minimum

of three classes. If they taught more than three, the three largest courses were selected to

participate in the research. This resulted in a total of six criminal justice classes and six

forensic investigation classes. If more participants were needed, they were selected from

the remaining classes taught by the four selected professors. Each set of three classes

taught by one professor would be randomly assigned a condition for their quiz (eye

imagery, neutral imagery, no image). This process resulted in four classes for each

condition. The randomized condition assignment was important in that it reduced any selection bias as well as instructor bias, resulting in fewer extraneous variables.

Participants

Participants for this research were selected from courses offered at Jacksonville State University (JSU) and were limited to classes offered within the Department of Criminal Justice and Forensic Investigation. The target population for this research is all JSU students who are enrolled in criminal justice and forensic investigation classes for the fall 2020 semester. Classes were selected using purposive sampling. All students in the selected classes had the opportunity to take the quiz, while students in all courses not selected did not have the opportunity to participate in the research. Twelve criminal justice and forensic investigation classes were selected (three courses each taught by four selected professors), taking into consideration that all courses would be offered in at least a hybrid setting in the fall semester of 2020 due to the COVID-19 conditions and would include an online class element. After the selection of each class and agreement from the professor to allow the quiz to be given in their three classes, each professor announced the quiz, presented as a bonus point opportunity that was voluntary and not required for the course (see Appendix B). It was emphasized that the quiz was optional and that not taking the quiz would not impact the students' grades negatively. Participants were those who were eligible and opted to take and complete the entire quiz. The data set contained only data from those participants who completed the quiz; data from those who did not complete the quiz were not used.

Materials and Programs

In order to establish constants across all classes and professors administering the quiz, each professor received the same email asking for permission to use their class in the study, the same message to use to introduce the class to the quiz, the same instructions and questions to place on each quiz, as well as the images placed on each quiz, dependent on which condition the class was assigned (see Appendices C, B, D, and A, respectively).

The quiz remained the same across each course as well. The quiz contained 10 questions total with seven criminal justice-, forensics-, and math-based questions, with some being of increased difficulty. The remaining questions pertained to the Internet browser the participant was using and if the participant had taken the quiz already for another class, thus eliminating repeat participants.

The program used in administering the quiz was Canvas, an online-learning platform. This platform was used because Canvas is JSU's sole option for giving quizzes and tests online as well as recording them. Rather than using other software more suited for research purposes such as SOGo or SurveyMonkey, using Canvas allowed for easier integration of this research into preestablished course outlines. Data collected from Canvas from each course module indicated the number of retakes a student performed when taking the quiz. The number of retakes from each student was stored, sorted by class, and analyzed using Microsoft Excel. This software also was used in the tracking and documenting of which classes were used in the research, tracking the scores

participants received originally and their last score, and which class was assigned which quiz image condition (eye image, neutral image, no image).

Design

Twelve criminal justice and forensic investigation classes were selected via purposive sampling in order to give three of their classes the quiz. All students in the selected classes had the opportunity to participate in the quiz, while all students in the classes not selected did not have the opportunity to participate. The quiz was presented to students in their online course module on Canvas and was presented as an online-only quiz that was optional and not required, with no negative repercussions from not participating. Students were offered an incentive through bonus points (the amount dependent on each professor's grading rubric for each course, but not an excessive amount). Once the quiz was taken by all participants, the students' scores for all quiz attempts and the number of times each student took the quiz were reported and gathered from each course. No other identifying information was taken.

The quiz instructions indicated for the student to voluntarily take the quiz but did not stipulate how many times the student could do so. The quiz was designed to display the correct answers after the first attempt and allowed for students to retake the quiz. There were criminal justice and math questions that were exceptionally harder than the rest, making it more likely for each student to have an imperfect grade and therefore want to retake the quiz. In order to make up for this deception, all participants were given the full bonus credit, regardless of how many times they took the quiz or their original score.

Data Set

Data were produced from Canvas through each professor. Data were produced through the quiz statistics for each course and were produced through an Excel spreadsheet. The Excel spreadsheet produced one row for each quiz attempt. Each spreadsheet contained a name and ID from each participant. Each professor then removed the names and replaced each ID with a unique ID. From this Excel spreadsheet, it was determined how many times each participant attempted the quiz, based on how many rows were associated with each unique ID number. Which classes had which condition assigned was logged in a separate Excel spreadsheet.

Independent Variable

Type of imagery placed on the quiz instructions and questions (eye imagery, neutral imagery, no image). Measured at a nominal level with eye imagery coded "1", neutral imagery coded "2", and no image coded "3."

Dependent Variable

If "cheating" occurred. Measured at a nominal level with "No" coded as "0" (zero), meaning the quiz was attempted once, and "Yes" coded as "1," meaning the quiz was attempted more than once.

Cheating

As defined for this research, cheating is when a student takes the quiz more than once in order to correct their answers. While not a traditional definition and required

some deception, the lack of instructions on how many times a student is allowed to take the quiz and a purposely extremely difficult question in order to make it more likely that a student will have an imperfect score is a measurable form of cheating that one can formulate for an online, nonproctored quiz.

Analysis

Analysis used was a chi-square test of the data. A chi-square test was the best fit for this data set in that the purpose was to determine if one variable was independent of the response to another variable—specifically, was the participants' likelihood to cheat independent from which image condition was on their online quiz. A chi-squared test was appropriate due to both variables (cheating and quiz image) being nominal. Additionally, due to the multiple categories of images that were applied, chi-square testing provided a flexible testing system (Healey, 2015). Its nonparametric aspect made a chi-square test appropriate in that an assumption about the shape of the population and sampling distribution was not required in order to successfully run the test (Healey, 2015). The bivariate table contained both the independent variable (quiz image) for rows and the dependent variable (cheating) for the columns. From the actual data collected, the expected counts were calculated using the computation formula (Healey, 2015, p. 269). The chi-square statistic was then derived from the formula with an alpha level of 0.05 (Healey, 2015, p. 269).

Strengths

The strengths of this research are that the sample selection process of purposive sampling is cost effective as well as time effective. Time efficiency was critical to research such as this where data was being collected from students by professors, then from the professors by the researcher. The use of purposive sampling allowed for 12 classes to be selected from four professors to decrease the number of communication channels that were maintained.

Benefits

The realm of online learning has grown tremendously and allows for continuation of learning to all types of students in situations where traditional online classes are not an option. This could be for students working full time, for the students who prefer online learning, or for students who are affected by natural disasters and public health issues. Online learning presents an easy way to limit disruption to students' education in times where in-person school cannot occur. While the move toward online schooling is beneficial in its ability to ensure that all students can continue learning, it removes many of the instructional aspects that enforce academic honesty. This can be partially combatted through programs that lock down students' browsers while completing a test or quiz, but these programs are not always used and can be difficult to install and use across all students' computers and browser types. The use of eye imagery is a cheaper

and easier option to curb cheating in online classes. Additionally, the use of eye imagery can be integrated into physical classrooms as well to provide another cheating deterrent.

Potential benefits for the participants were the bonus points, which outweighed the minimal risks that were incurred by the participant. Minimal risks were incurred through the use of deception, but this was counteracted by both the debriefing message and the reward of bonus points, therefore helping the participants' grades with no chance of bringing their grades down.

Risks/Deception

Deception was used in the design of this research. Due to the online nature of this research, it was difficult to develop a unit of measurement for the aspect of cheating. Most forms of cheating prevention come in the form of a browser lock-down system, which does not assist in measuring cheating remotely. By omitting instructions regarding how many times the participant should retake the test, this created a form of measurement for cheating.

Debriefing was provided in the form of an announcement via each professor administering the quiz. The announcement stated that the quiz was only meant to be taken once, and because of the discrepancy, all who took the quiz, no matter the participant's score on the quiz, would receive the full bonus credit.

This research posed minimal risks to all participants in all areas. No identifying information was taken from the participants, so there was no threat to confidentiality, reputation, or employability. Due to the online nature of this quiz, there were no threats to

participants' physical, social, or legal conditions. Psychologically, participants endured a slight form of deception but not to any harmful extent. All participants were rewarded full bonus points for the quiz after it was taken in order to compensate for the deceptive nature of the test.

Limitations

This research was originally planned to be a study of CPTED practices, specifically the use of watchful imagery, inside a traditional classroom setting. The research would have involved the removal of proctors during self-graded quizzes, similar to Tittle and Rowe's (1974) research. This research design was formulated during the spring 2020 semester but was derailed due to the COVID-19 pandemic and the subsequent move to online classes. In an effort to be prepared for the fall 2020 semester, this research was reformulated to fit within an online setting. This did limit the study in that the measure of cheating differs greatly between in person and online classroom cheating. While the measure of cheating used in this study was somewhat modified and less traditional, it is a creative solution to the issue of classes not being offered fully in-person for the fall 2020 semester.

The study was further limited by the move online because of a reduction in the possible target population. By measuring cheating in the classroom, it would have been easier to contact other departments in order for this to take place. Due to the limited person-to-person contact expected in the Fall 2020 semester, the target population was limited to within the criminal justice and forensic investigation department. This allowed

for better communication with participating professors due to taking advantage of the already established lines of communication and familiarity with the department and classes.

The use of purposive sampling caused additional limitations within this study. Purposive sampling is a form of nonprobability sampling, which limits both the generalizability and the representativeness of the data gathered.

The use of a quiz as the data collection form introduced further limitations in that response bias factored into those who elected to participate in taking the quiz. Students with lower grades (or grade expectations) could have had a higher likelihood of taking the quiz than those students with higher grades. Another limitation involved with a voluntarily based response is that while the classes selected had a larger class size, the number of participants could not be confirmed prior to administration of the quiz. Additionally, the principal concept of the form of cheating measured in this research involved the retaking of a quiz in order to improve a student's score. This was limited by the fact that some students might not have needed to retake the quiz due to a perfect score. While this was counteracted through the inclusion of difficult questions, it was an unavoidable pitfall in this measure of cheating.

IV RESULTS

The purpose of this study was to observe if there is a relationship between eye images and cheating in criminal justice and forensic investigation students in online quizzes. The null hypothesis was that the variables of "eye imagery" and "cheating" are independent, while the alternative hypothesis was that the variables of "eye imagery" and "cheating" are dependent. The test run on the data was a chi-square test of independence with an alpha level of .05.

H_0: The variables "eye imagery" and "cheating" are independent.

H_A: The variables "eye imagery" and "cheating" are dependent.

The sample size of students with the opportunity to participate in the study was 319. Of the 319, 172 students participated by taking the quiz assigned to their class, resulting in a response rate of 53.9%. There were 35 participants who retook the quiz (20.3%). See Table E1 to for initial data. Seventy participants were removed in order to eliminate data that did not apply to the research question. This included removing students who answered "Yes" to Question 1 (See Appendix D, Question 1), which asked if the participant had already taken the quiz in another class, to remove any overlap. Those who had taken the quiz before were shown the correct answers and would likely

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recall the answers, therefore lowering their incentive to retake the quiz. Any student who made a perfect score on their first attempt was removed due to the lack of incentive to retake the quiz.

After removals, there was a total of 102 participants, with 30 who retook the quiz (29.4%). See Table E2 for data after removal.

In order to run the chi-square test of independence, four assumptions must be confirmed. The chi-square test of independence required the sample to be taken through a simple random sample. The sample for this research was done through purposive sampling, which was not fully randomized but which course received which treatment randomly within each set of courses. In order to assume a normal distribution, two further requirements must be satisfied: No more than 20 percent of expected cells are less than five (See Table E4). Additionally, the population must be at least 10 times the sample size. Due to the limited nature of this research, the population of all criminal justice and forensic investigations students enrolled at Jacksonville State University is not more than ten times the sample size. While this requirement is not satisfied, independent observations can still be established in that students who took the quiz in a previous course (See Appendix D, Question 1) were removed from the sample population, therefore ensuring that each individual in the sample appears only once. All expected cell counts are at least one (See Table E4). All variables measured are categorical.

A chi-square test of independence was performed to examine the relation between eye imagery and cheating. The relation between these variables was not significant: $x^2(2, n = 172) = 0.098$, $p = 0.952$. P-value was obtained through SPSS readout (See Table E5).

Limitations

As previously discussed, the method of sampling limits this research. Purposive sampling was utilized due to the limited sampling population as well as the online nature of this research. Instructors were selected who taught three classes in the fall 2020 semester. While purposive sampling limits both generalizability and representativeness, further measures were taken in order to minimize potential bias. Each instructor's three courses were randomized in their treatment selection, and instructor bias was controlled for by ensuring that all instructors gave the quiz with each condition applied. Ideally, each student would have taken a quiz and been assigned a condition on an individual basis rather than an entire class being assigned the condition, but the limited nature of Canvas and the researcher's access to Canvas prevented this method of randomization.

An additional limitation that arose was that of the nonuniform time in which the quizzes were available for each student. Due to the nature of this research, it required some reliance on each enlisted instructor to upload the quizzes in the time frame given to them. Due to an unfortunate event related to technological issues, one instructor's set of quizzes were available for a shorter length of time than the others. While the assumption can be made that most students would immediately retake the quiz after their first attempt if they were going to retake it, making the span of availability a nonissue, the results would not be altered drastically if those courses were removed. The conclusion would remain the same.

In considering the level of classes selected, another limitation is introduced. Courses were selected across a range of academic levels, from 100 freshman-level

courses to 300 junior-senior-level courses. This could present an issue of the difference in cheating opportunities in that students who are taking 300-level courses have more knowledge about not only the subject matter of the quiz, but also of regulations set by the professors and the university concerning cheating, leading to a lesser chance of upperclassmen cheating. Conversely, academic apathy could factor into upper-level students being more prone to cheat due to their disinterest in obtaining a passing grade in an honest manner. In filtering the results based on course level, there is no change in the conclusion, indicating that lower- and upper-level students respond similarly when presented an opportunity for cheating in online courses.

V CONCLUSION

Based on the analysis of the chi-square test of independence preformed, there is
not a significant association between eye imagery and cheating. Across each treatment,
the number of students who retook the quiz remained the same (ten students in each
condition). While the results of this study were highly specific to criminal justice and
forensic investigation students enrolled at Jacksonville State University, there seems to be
little indication that this type of cheating deterrent would be effective with other types of
students.

In examining the results with those of similar studies (Haley & Fessler, 2005;
Bateson et al., 2006; Ernest-Jones et al., 2011; Nettle et al., 2012), the ineffectiveness of
this research could be contributed to the difference in the level of territoriality based on
the locations of each study. Previous research such as Bateson et al.'s (2006) takes place
in a public setting (a coffee shop), while Ernest-Jones et al.'s (2011) research took place
in a semi-public setting (university cafeteria), and Haley & Fessler's (2005) took place in
a semi-private location (controlled computer lab). These studies all indicated that imagery
was effective in increased pro-social behavior. In comparing this research with even the
highest level of territoriality in the previously mentioned studies, Haley & Fessler's
(2005) semi-private environment of a controlled computer lab still presents a more public
setting than the fully private environment of online, non-proctored testing. As Oscar

Newman states when defining the importance of natural surveillance, the ability to observe must be paired with other influences, mainly referring to the concept of territoriality (Newman, 1972). As such, the lack of territorial reinforcement found in a private environment could be a factor in the ineffectiveness of the eye image.

  The results of this research bring into question how humans distinguish between a real sense of being watched by another person and a manufactured sense of being watched, as done with images of eyes. Based on previous research (Bateson et al., 2006; Ernest-Jones et al., 2011; Nettle et al., 2012; Bateson et al., 2013), it is clear that manufactured eye imagery can be effective in increasing prosocial behavior, including less littering, fewer bike thefts, and a greater number of anonymous donations. Previous research all utilized signage and real-life settings; therefore, the issue must arise from the online delivery of the eye images in the case of this study. While oversaturation of the field could be affecting the results (as in the students take the online quiz while others are present in the room, lessening the effects of the eye images), another reason to consider for the ineffectiveness could be long-term conditioning of seeing other people or eyes online in various forms. Social media has normalized the feeling of sitting on a computer and "seeing" other people. This applies to smartphones and even to television and streaming services that can be used on the same computer on which online schooling takes place. This could factor into the ineffectiveness of the eye images found in this research.

  In addition to potential long-term conditioning, the ineffectiveness of the eye imagery could be related to the location of the eyes in the online quiz. The eye image was placed at the top of each question of the quiz. It is possible that the student would see the

eye image first, then move on to reading and answering the question. If the placement of the eye image was changed to the bottom of each question, the student would first read and answer the question, then before selecting the "next" button, they would see the eye image, making them reconsider their selection and method of getting the answer.

Further considerations must be made in understanding the results of this research. There were 172 students out of a sampled 319 who participated in taking the quiz which is a 53.9% response rate. This rate dropped drastically when removals were made to eliminate data that did not apply to the research question, from 53.9% to 32%. These removals represent the students who had no reason to retake the quiz by either making a perfect score on the first attempt or those who had taken the quiz before in another class. Of the initial 172 participants, 40.7% of those were removed, indicating there was too much overlap of students in the selected courses or the questions needed to be increased in difficulty. This dropped the response rate, which presents an issue of nonresponse bias.

The low response rate could also be due to lack of enough incentive. Each professor was instructed to offer bonus points to those who participated in the quiz. Three of the four professors offered the quiz as an 8-point bonus quiz that scales into their current grading system, while the remaining professor offered the quiz as a 4-point bonus opportunity where the bonus points would be applied onto the next test. Bonus point based incentives could have been less effective in this study due the timing of the research. The quizzes were offered during the month of September, which is the first full month of the fall semester. Students might not be concerned with bonus point opportunities at that time in the semester since they are just getting started in their course work.

While the use of eye imagery in an online classroom was a unique concept to test regarding its effectiveness to deter cheating, online academic dishonestly would be deterred more effectively through other, more concrete means such as an Honorlock system or different testing strategies. This research does raise further questions regarding if and when eye imagery can be effective as a deterrent in academia.

Further Research

As mentioned previously, this research was initially to be performed in face-to-face classroom settings with the same images applied and self-graded quizzes. While COVID-19 disrupted the original research design, the results of this research should not discourage a replication of this study with the original research design. The online delivery of eye imagery was proven to be ineffective, but previous research (Bateson et al., 2006; Ernest-Jones et al., 2011; Nettle et al., 2012; Bateson et al., 2013) supports the use of signage containing eye images in real-life settings and could be applied to face-to-face classroom settings.

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APPENDIX A

Figures

Figure 1.

Eye Image (Eyes #1394269, n.d.)

Figure 2.

Neutral Image (Bartus, 2018)

APPENDIX B

Quiz Announcement and Instructions

Quiz Announcement

I will be offering a bonus point opportunity via a short online quiz on Canvas. This quiz is **OPTIONAL**, and you are **NOT REQUIRED** to take it. However, by taking this quiz you can receive up to [AMOUNT ENTERED HERE] bonus points.

The results from this quiz will be used to aid a graduate student in their thesis research, but **no names or identifiers will be used**. Again, this quiz is **VOLUNTARY AND NOT REQUIRED**. No penalties will be applied if you do not take this quiz.

Quiz Instructions

There is a 15-minute time limit to take the quiz. Do all work on your own without the assistance of other students, notes, textbooks, the Internet, or a calculator. No penalties will be applied if you do not take this quiz. The quiz can be exited at any time with no penalties. The score will determine the amount of bonus points you will receive, which are considered extra credit for this class.

Important note for users of the Safari browser

By default, Safari may block images in this quiz. These images are essential to the quiz. If you must use the Safari browser, and you cannot see any images in the quiz, try temporarily disabling the "Prevent cross-site tracking" option in the privacy settings

(Safari > Preferences > Privacy). This should allow images to appear on the quiz in

Canvas. This should not be an issue with any of the other popular browsers.

APPENDIX C

Recruitment Email for Instructors

Recruitment Email for Instructors

[GREETING HERE]

      I am reaching out to you to see if you would allow me to include your Fall 2020 classes [SPECIFIC CLASSES HERE] in my thesis research project: "Effects of Eye Imagery on Criminal Justice and Forensic Students Cheating in Online Testing." I have attached a copy of my methodology for this research for further reference.

      I would need you to administer an optional, voluntary quiz via Canvas with the incentive of bonus points (as determined by you, based on your class grading/point structure). This quiz is premade and consists of five general criminal justice/forensic questions along with a few other housekeeping questions. The quiz would need to be given between September 7 and September 21, but the earlier the better.

      The quiz should not take students longer than 10 minutes and will be set to show them the correct answers after their first attempt and will allow retaking the quiz. After giving the quiz, I would need to meet with you in person or have you report to me how many times each student takes the quiz. I will be happy to help in any way possible to get the quiz set up so that this additional quiz will not cause you any extra work.

      If you are interested in helping me with my research, please let me know by replying to this email. I will then send you all the elements required for the quiz (instructions, questions, photos).

Thanks so much, and I hope to hear from you soon!

Kortni LaRue

APPENDIX D

Student Quiz (With Answers)

Student Quiz (With Answers)

1. Have you taken this quiz before for another CJ/FI course?

    - Yes

    - No

2. The first 10 amendments to the U.S. Constitution are collectively known as _____.

A. the Bill of Rights

B. the Preamble to the Constitution

C. the enumerated powers

D. the Articles of Confederation

Answer: A

3. This U.S. Supreme Court case noted that in order for force to be justifiable, it must be "objectively reasonable in view of all the facts and circumstances of each particular case."

A. *Miranda v. Arizona*

B. *Terry v. Ohio*

C. *Graham v. Connor*

D. *Buie v. Maryland*

Answer: C

4. The U. S. Supreme Court decision in _____ created the "hot pursuit" exception to the warrant requirement.

A. *McCulloch v. Maryland*

B. *Gideon v. Wainwright*

C. *Miranda v. Arizona*

D. *Warden v. Hayden*

Answer: D

5. A smaller patrol area within a larger command area is frequently called a _____.

A. beat

B. precinct

C. district

D. division

Answer: A

6. _____ refers to accepted policies, rules, and principles of conduct that are situationally applied.

A. Organizational vision

B. Decision making

C. Discretion

D. Organizational culture

Answer: D

7. Compute the following without the use of a calculator:

$$1005 + 45 + 1000 + 35 + 1000 + 25 + 1000 + 15$$

Answer: 4,125

8. Compute the following without the use of a calculator:

135 - (30 + 55) - 60 / 20

Answer: 47

APPENDIX E

Tables

Table 1

Quiz Results (Original)

	No image	Neutral image	Eye image	Total
No retake	48	45	44	137
Retake	12	10	13	35
Total	60	55	57	172

Table 2

Quiz Results (After Removals)

	No image	Neutral image	Eye image	Total
No retake	26	22	24	72
Retake	10	10	10	30
Total	36	32	34	102

Table 3

Chi-Square Actual Counts

		No image	Neutral image	Eye image	Total
Cheating	No retake	26	22	24	72
	Retake	10	10	10	30
	Total	36	32	34	102

Table 4

Chi-Square Expected Counts

		No image	Neutral image	Eye image
Cheating	No retake	(72*36) / 102 = 25.4	(72*32) / 102 = 22.59	(72*34) / 102 = 24
	Retake	(30*36) / 102 = 10.59	(30*32) / 102 = 9.4	(30*34) / 102 = 10

Table 5

SPSS Chi-Square Test Output

	Value	df	Asymp. Sig. (2-sided)
Pearson chi-square	.098[a]	2	.952
Likelihood ratio	.098	2	.952
Linear-by-linear association	.024	1	.878
N of valid cases	102		

[a] 0 cells (.0%) have expected count less than 5. The

minimum expected count is 9.41.