

# The Contemporary Plagiarist: The Roles of Technology and Moral Development

*Completed Research Paper*

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## Abstract

*This research examines a chronic problem in academic settings – inappropriate copying or misuse of source materials–i.e., plagiarism. We conduct a computer-based writing experiment to examine the effects of psychological and situational characteristics on subjects' propensity to misappropriate text. Specifically, we examine to what extent such misappropriations may be explained by available technological support and an individual's level of cognitive moral development (CMD). We hypothesize that more technological support will be positively associated with misuse while advanced CMD will be negatively associated with misuse. Lastly, we explore the interaction of technology and CMD on our measure of misuse. We find that both CMD and technology play a significant role in explaining such misappropriations. Subjects in the high technological support condition demonstrate a level of misuse that is significantly higher than those in the control condition. While higher levels of CMD are associated with a significant decrease in misuse.*

**Keywords:** plagiarism, cognitive moral development; ethical decision-making, information technology, experiment

## Introduction

Academic misconduct is a widespread phenomenon that occurs among faculty and students alike. Academic misconduct in general, and plagiarism in particular, has become a chronic problem in universities around the world (Elias 2009; Yates 2007). Smyth and Davis (2004) reported that 74% of students in universities and colleges witnessed cheating in school and 45% admitted to cheating themselves. Berardi et al. (2004) conducted a study using psychology and business majors and found that over 66% of the students surveyed reported that they have cheated at some point in their lives.

In response, the past decade has witnessed substantial growth in the number of required business ethics courses offered by graduate and undergraduate business school programs around the United States (Weber et al. 2008). It is presumed that “college students will develop greater ethical sensitivity and awareness upon graduation...” with ethics instruction and guidance (Mai-Dalton 1987: p. 509). Since most companies “present their employees with the conflict between selfishly pursuing their own financial goals and being honest” it is important that individuals learn how to ethically deal with this pressure before entering the workforce (Mazar and Ariely 2006: p. 118).

Ironically, given the rise in ethics education, there exists a great deal of evidence that academic dishonesty among university students continues to rise (Celik 2009). A recent study by the Josephson Institute of Ethics found that young adults are exhibiting a general deterioration of ethics and developing a more lackadaisical attitude towards cheating (2006). What accounts for this rise in this behavior? One often cited factor is the increasing ease with which students can locate, access, and consume information resources using information technologies (Auer and Krupar 2001). Thus, despite efforts to encourage ethical behavior amongst students, they are cheating at increasing rates and in new ways that often involve the use of technology (Etter et al. 2006; Ma et al. 2007).

Hence, personal and situational factors associated with academic misconduct are an important line of inquiry for both academics and for researchers studying dishonest behavior in various contexts. Thus, our research questions are as follows: (1) *Is cheating behavior affected by an individual's level of moral development*, (2) *how do common software productivity features affect cheating behavior* and, (3) *how do common software productivity features impact the relationship between moral development and this unethical behavior*? In examining these questions, we hope to offer some insights into how to discourage unethical behavior in the classroom.

The remainder of the paper is structured as follows: In the next section, we review recent research on student academic misconduct. We establish a link between the academic settings and the workplace environment. Next, we develop theoretically grounded hypotheses linking cognitive moral development and technology to academic misconduct. In the methods section we present the unique experimental design of our study and introduce our constructs and empirical models. Lastly, we report our results and offer explanations for our findings. Implications for business organizations are emphasized and future research avenues are proffered.

## Cheating in Academic Settings

Research on academic dishonesty ranges from studies on frequency rates of students who cheat (Brown and McInerney 2001; Chapman and Lupton 2004; Cole and McCabe 1996; Dawkins 2004; Diekhoff et al. 1996) to studies on how individuals go about cheating (Spiller and Crown, 1995). Evidence of cheating in classrooms comes less from faculty whistle-blowing and more from student self-reports (West, Ravenscroft and Shrader 2004). These self-reports have historically provided information on past student cheating, intentions to cheat, and student reasons for engaging in plagiarism (see Cizek 1999). However, this information may be conservative in that there is a major incentive for students to give inaccurate information on the self-reports due to the social desirability bias (Glass and Hopkins 1996). Thus, the difference between intent and attitudes and actual behavior could be quite substantial. In order to discover the real factors which facilitate or deter cheating, research must observe actual behavior (Karlins et al. 1988). To that end, the research presented here conducts an experiment to measure students' actual cheating behavior.

The literature on how to combat dishonest behavior can be organized into two main streams—the economic model stream, which emphasizes rational self-interest and the benefits and costs associated with an action, and the psychological stream, which focuses more on the cognitive factors affecting behavior. In the economic model, persons are viewed as being rationally self-interested and act according to the risks involved in a decision and the opportunities for personal gain that may be available (Misanygi et al. (2008). Corrupt or dishonest behavior often results when the potential opportunities for gain associated with a socially undesirable act outweigh the potential costs. Dishonest acts are assumed to occur, which often leads to the development of rules and punishments to mitigate the undesirable behavior. Disciplinary structures in economic systems resemble those found in academic settings to curb cheating. It is common for educators to increase deterrent measures for cheating in the classroom. Studies have shown that increased punishments for students who cheat do carry a deterring effect (Stevens and Stevens 1987). Attacking corruption (of any kind) “through the imposition of added regulative and punitive structures is a common approach” (Misanygi et al. 2008: p. 752). The idea behind this type of structure is to make behavior more transparent, and people more accountable for their actions. According to this approach, decisions to be honest or dishonest simply depend on the expected external benefits to the moral actor. Decisions to cheat are just another context in which a cost-benefit analysis is conducted (Mazar and Ariely 2006). In a study of college students’ attitudes towards cheating, Williams and Hosek (2003) argued that in general, students are rational decision-makers who decide to cheat when they perceived the risks of being caught cheating were less than the benefits they could have received by cheating.

To understand why students cheat, the study of psychological variables of the individual rule breakers (i.e., the second main stream of research in the area) has received some attention (Kisamore et al. 2007). Elias (2009) recently examined the impact of anti-intellectualism attitudes on business student perceptions of cheating. He found that students with a “negative view of the value and importance of intellectual pursuits and critical thinking” had a much higher likelihood of cheating than those with a positive view (p.86). Another part of his study considered students’ beliefs in their ability to complete an academic task. Those students with low self-efficacy were not as likely to perceive cheating in college as an unethical act. Related to this line of inquiry, Pino and Smith (2003) measured students’ “academic ethic,” which indicated a certain level of dedication to learning. Those with an academic ethic—having a high level of dedication to learning—were found to cheat less often than those students who did not possess the characteristic. Low self-esteem of the individual was also found to have a positive effect on the propensity to cheat (Iyer and Eastman, 2006).

In another broad study on attitudes of university students, Bolin (2004) found that attitudes towards cheating mediated the relationship between self-control and academic dishonesty. Those with negative attitudes towards dishonest work practices were less likely to engage in cheating. The author also found that when students perceived there being a clear opportunity to cheat, they were more likely to do so. This has implications for our study in that increased technological leverage could indeed facilitate the stealing of intellectual property on computer-based work tasks. If students perceive an increased opportunity to cheat through technological features, it may affect their behavior.

Personality type was also found to be a contributing factor on what kinds of students cheat. Those students with aggressive, impatient, and confrontational personalities (Type A) were found to cheat at a higher rate of frequency than Type B personality types (Perry et al. 1990). A recent study took a positive psychology view of honesty in academic environments and examined the character strength of students (Staats et al. 2008). Academic honesty was predicted by the character traits of courage, empathy, and honesty. Firmin et al. (2007) studied students’ affective responses to witnessing cheating behavior and found a wide range of negative psychological and emotional reactions. Students were often frustrated and anxious when they witnessed peers cheating on academic exercises. Regardless, cheating continues to be a chronic problem.

Situational factors also seem to matter. McCabe et al. (2002) found that although academic institutions explicitly state that cheating behavior is condemned, students still believe it is socially acceptable. The socially relativistic behavior of peers appears to have more of an effect on behavior than formal policies. Thus, the academic integrity culture of the institution becomes more important to affecting dishonest behavior than does a written code (Smyth and Davis 2004). Kisamore et al. (2007) found that personality variables and integrity culture interacted to influence the intent to cheat among students.

Lastly, and perhaps not surprisingly, academic dishonesty appears to be a predictor of dishonesty later in one's career. A 2009 study by the Ethics Resource Center in Washington, DC revealed that over a third of business managers surveyed witnessed ethical misconduct among employees (<http://www.ethics.org/>). "Research on cheating...is important because students who cheat in academic settings are more likely to demonstrate future professional misconduct" (Atmeh and Al-Khadash 2008: p.113). Cheating in school was also found to be highly correlated with cheating in public domains (Fass 1990). For instance, individuals who were repeatedly dishonest on assignments in school were much more likely to cheat on their taxes, or in politics. Based on an acknowledgement that dishonesty in university settings often translates into similar kinds of unethical behavior in the workplace, Klein et al. (2007) studied cheating among business students compared with cheating among college students from other majors. They found that business students cheated at a much higher frequency than did their non-business student peers. Such results serve as a warning to both faculty members and business managers alike. Cheating behavior may be a sign that ethical business practices values have not been ingrained in individuals (West, Ravenscroft and Shrader 2004). Thus, academic cheating may be viewed as an indicator of the absence of ethical values and such behavior may transfer to subsequent behavior in a business (Sims 1993).

In summary, academic misconduct should be studied with the assumption that it is a complex behavior with potential downstream consequences for organizations and institutions. Examining individual or situational factors alone is unlikely to lead to a full understanding of academic dishonesty (Kisamore, et al. 2007). Hence, it is critical to examine multiple factors theoretically linked to cheating in order to achieve a more comprehensive understanding of the phenomenon. The research presented here examines both individual/cognitive factors as well as situational factors related to this type of ethical misconduct.

## **Hypotheses Development**

### ***Cognitive Moral Development***

Albrecht et al. (1995) suggest that dishonesty in any form partially is due to a lack of individual integrity. Although these authors acknowledge the role of personal and socialization pressures, they emphasize individual development factors on the tendency to cheat. Cognitive moral development (CMD) is a stage theory developed to explain how individuals think or reason with regard to their interactions with their social environment (Kohlberg 1971; 1981). Kohlberg's theory argues that an individual's present level of moral reasoning includes problem-solving techniques learned in earlier stages. As an individual develops, they acquire broader socio-moral perspectives and techniques that can be used in relating to the environment. Thus, as individuals age, become more educated, and gain life experience, they advance through the stages of moral reasoning at different rates and to different degrees (Kohlberg 1981; Trevino 1986).

Each of Kohlberg's three levels characterizes a distinct approach to thinking about interaction in one's social environment, with two stages existing in every level. Within the levels, the second stage represents a somewhat advanced and organized form of the general levels of development (Weber and Wasieleski 2001). An antecedent to moral behavior is the reasoning process used to make a judgment. Ethical behavior has been shown to be greatly influenced by an individual's moral reasoning (Colby and Kohlberg 1987). Thus, a person's decision to act in a certain manner will be affected by the stage of moral reasoning they utilize to make that decision. A person's moral reasoning can be affected by numerous situational and environmental factors (Trevino 1986).

Despite an individual's predominant level of moral development, it is possible to reason at varying stages for any given issue. The stage of reasoning used to consider ethical dilemmas is easily manipulated. Past studies have shown that context of the issue itself influences the stage of reasoning people use to resolve the dilemma (Weber 1990; Weber and Wasieleski 2001). The type of issue itself was also shown to affect the moral reasoning of individuals when resolving dilemmas (Weber 1996). Moreover, moral reasoning stages have been shown to increase with ethics education (Arlow and Ulrich 1985), but can easily revert back to lower stages if ethical principles are not reinforced.

Individuals who reason at a pre-conventional level, and are only concerned with their own interests, will likely evaluate the organization's treatment of them based on the degree to which their interests are met, or to the degree to which they avoid punishment. An individual operating at this level is concerned only

with the personal consequences associated with any action. At the conventional level, individuals are inclined to look to others in their social group or consider laws and social norms when evaluating the degree to which the organization supports him/her. Thus, social reciprocity is driven in part by the specific environment surrounding the individual. Within this level, a person may be motivated by the desire to meet the expectations of her peers, family, and social group or, driven by a consistent set of codes and procedures. In classroom settings, students reasoning at this level are likely to be differentially sensitive to the university's culture and to their referent social groups. Finally, individuals at the post-conventional level are more likely to consider the greater good or respect for universal human rights and perceptions of justice when evaluating the degree to which the organization fulfills their expectations of society. The socio-moral perspective of people reasoning at this level is beyond society because they do not rely on the conventions of society to necessarily determine what is right and wrong (Trevino and Nelson 2010).

Higher stages of moral reasoning are thought to lead to more ethically desirable behavior (Ryan 2001). Individuals who reason at the post-conventional level of reasoning utilize universal ethical norms and principles to form their attitudes and make decisions. Maintenance of the social contract is paramount to people reasoning at this level. Thus, the principles used to preserve the proper functioning of the implicit social contract with society are perceived as being critical to decision making. To maintain mutually trusting relationships between two or more parties requires a respect for the other's human rights, which includes a right to fair treatment and honesty. If a person is partly basing his/her judgments on deontological principles, then it logically follows that that individual is less likely to engage in behaviors that disregard or breach these principles. Post-conventional reasoners are assumed to think about what is best for a global society in the long term. Instrumental decisions, which only serve the individual's immediate interest, are generally not viewed as serving society, and thus, are more likely to be avoided.

The Theory of Reasoned Action (TRA) (Ajzen and Fishbein 1969; 1980) states that an individual's social norms and attitudes are related to that person's intentions to act in a certain manner. TRA is often used to describe ethical behaviors in organizations. An individual's belief regarding a response towards an issue does directly affect behavioral intentions. Thus, if a person has a predisposition to believe that dishonest behavior (i.e., the stealing of intellectual property) is ethically wrong, that person probably will not intend to engage in that act. Attitudes have been shown to be predictors of students' cheating behavior (Beck and Ajzen 1991). "If beliefs and attitudes influence behaviors, it is reasonable to expect that individuals who believe dishonest acts to be acceptable behavior are more likely to engage in dishonest behavior ..." than those who believe dishonest acts are less ethically desirable (Nonis and Swift 2001: p. 73). Loch and Conger (1996) showed that attitudes and social norms regarding computer-related activities play a role in forming intentions to act. An extension of the TRA is Ajzen's (1991) Theory of Planned Behavior. The more strongly an individual intends to engage in a certain behavior, based on their ethical beliefs and attitudes towards the behavior, the greater that person's ability to engage in that behavior. Thus, predisposed views of a behavior will affect the intent to act, and ultimately, influence behavior.

This leads us to believe that principled reasoners are the most likely persons to find the theft of intellectual property unacceptable. In the present study, the stealing of intellectual property in the form of plagiarism on an assignment would occur less frequently among reasoners utilizing a principled moral schema because it is not universally fair or honest. Thus, we would expect individuals using principled reasoning are less likely to be dishonest on an assignment or task. Therefore, Hypothesis 1 states:

***H1: The use of principled moral reasoning will be negatively associated with plagiarism.***

### ***Information Technology and Barriers to Cheating***

Although the incidence of dishonest behavior in academic settings has been well documented since the World War II era (Drake 1941), the information age has generated new opportunities and ways for students to cheat (Ma et al. 2007). With the proliferation of various information technologies available to complete computer-oriented tasks, the collection, storage and access to information has increased exponentially (Winter, et al. 2004). Features such as copy, search, and cut-and-paste all enhance a person's productivity on computer-based tasks. These factors are quite useful for transferring information and data quickly as they speed the process of acquiring and utilizing information. However, these features are often misused or abused by users. For instance, Auer and Krupar (2001) argue that plagiarizing of

assignments in academic contexts has increased in part due to a broadening of availability of information online. Moreover, technologies used to access data online “make it much easier to copy and distribute intellectual property” (Mann and Frew 2006: p. 280). Failure to acknowledge and-or supply proper attribution of thoughts and ideas is at the heart of one of the most common types of academic misconduct – plagiarism (Cizek 1999; Gresham 1996). The threat of plagiarism is increased by the facilitation of productivity on computer-based tasks. Users ability to accumulate, store, alter, and transfer data using information technology features greatly raises the risk that intellectual property rights will be breached (Shaw 2003). “The easiest way for a student to plagiarize is to copy and paste information directly from the Internet, and this appears to be among the most common ethics violations” (Ackerman and White 2008: p. 111).

Following from the previous discussion, the most intuitively appealing explanation for why technology is likely to be associated with academic misconduct in general and plagiarism in particular is one of increased *opportunity*. Opportunity is a common construct in several theories of deviance including Social Control Theory (Hirschi 2002b) and the General Theory of Crime (Gottfredson and Hirschi 1990). Theories of deviance have been used not only to explicate deviance that reaches the level of criminality but also for many types of general deviance including academic misconduct and other types of rules violations (Bolin 2004; Smith 2000). According to the General Theory of Crime, for example, unacceptable behavior (or deviance) can only be expressed in the presence of an obvious opportunity (Gottfredson and Hirschi 1990). Moreover, such opportunities are “circumscribed by the potential of bringing immediate benefits, the ease of committing the act, and the absence of a high risk of detection” (Smith 2004: p. 549). Opportunistic behavior is also facilitated by the technology itself (Chatterjee 2008). That is, there are characteristics of the technology that act to facilitate or enhance opportunity for wrong doing (Auer and Krupar 2001; Comas-Forgas and Sureda-Negre 2010; Rubin 1994). These characteristics are speed, anonymity, virtualization, and ease of use.

Several scholars cite the speed of technology vis-à-vis more traditional methods as being partially culpable for increases misconduct such as plagiarism (Auer and Krupar 2001; Chester 2001; Fitzgerald 2002; Rubin 1994). For instance, copying text from the Web eliminates the need to retype text and can be accomplished in a matter of seconds. This efficiency can “lead to carelessness in thought, carelessness in citing material, and ultimately to plagiarism” (Auer and Krupar 2001: p. 419). In addition, the speed with which acts can be carried out using technology also decreases the chances of immediate detection which increases the sense of inconspicuousness. If individuals feel the risk of being caught is low, they may be more willing to engage in the misconduct, or at least be more tempted to use technology for these purposes. Judgments regarding the likelihood of detection are also a common factor cited in criminal, moral and academic acts of deviance (Loch and Conger 1996; McCabe et al. 2001; Willard 1998). An increased sense of anonymity contributes to one’s belief that deviant acts will go undetected and thus increases opportunity of occurrence (Comas-Forgas and Sureda-Negre 2010; Hirschi 2002a). The sense of anonymity when using technology is consistent with studies of computer mediated communication that show that technology gives rise to behaviors that are uncharacteristic and would be unlikely to occur in a more traditional face-to-face exchange (Sproull and Kiesler 1986).

In several recent works examining digital plagiarism, researchers have found that digital technology increases opportunity for misconduct by a potential plagiarist by removing nearly all physical barriers to locating and illicit copying of electronic materials (Auer and Krupar 2001; Comas-Forgas and Sureda-Negre 2010; Etter et al. 2006). This virtualization not only applies to the location of artifacts but to the artifacts themselves. For example, the virtualization of previously physical artifacts such as articles, books, CDs (music), DVDs (movies), etc. appear to give users a sense that items are in the public domain and not worthy of the same level of protection or treatment as their physical counterparts, and are thus more likely to be misappropriated by users (Friedman 1997; Renard 1999).

Lastly, technical advances in user interface design, network bandwidth and available content have effectively lowered the barrier to many types of technology enabled activities – both good and bad (Anandarajan 2002). For example, not more than 10 years ago, watching an online movie was a daunting technical task. Content availability and network bandwidth aside, assembling and installing the requisite software was quite difficult indeed (Coorough 2001; Vaughan 2001). The opportunity afforded by the ease with which such activities can now be carried out is often cited as a contributing factor in violations of security and acceptable use policies (Campbell 2010; Eastin et al. 2007; Venkatraman 2008). As noted by

Rubin (1994), “It is very easy to be bad, when using information technologies” (p. 130). Thus, all else being equal, we would expect that the opportunity to engage in unethical behavior created by information technology features will impact behavior. Therefore, Hypothesis 2 states:

***H2: Information technology features designed to improve productivity will be positively associated with plagiarism.***

Returning to the Theories of Reasoned Action and Planned Behavior, actual behavior is not explained by attitudes, norms, and intentions alone. Behavioral control is also dependent upon the extent to which an individual has the necessary skills to perform an act, and on the resources available to the person required for engaging in the act (Atmeh and Al-Khadash 2008). So despite a person’s beliefs about the ethical desirability of cheating, if the person does not have access to the sources needed to cheat, the dishonest behavior is unlikely to occur (Mann 2006). By the same token, when the resources needed to cheat are available and accessible to the social actor, it is expected that cheating behavior is more likely to occur. The presence of information technology features on a computer-based assignment that can facilitate the stealing of intellectual property would be expected to increase the incidence of ethical misconduct, regardless of the individual’s moral predisposition. Hypothesis 3 states:

***H3: The influence of principled moral reasoning in limiting misconduct will be moderated by the presence of information technology features designed to improve productivity.***

## Method

To explore the relationship between cognitive moral development, technology and academic misconduct in computer based tasks, we used a mixed methods approach involving both subjective and objective measures (Tashakkori and Teddlie 1998). Our study involved (1) assessing participants’ CMD and general technology knowledge and (2) measuring the degree of similarity between a response and stimuli document arising during the completion of a computer based exercise. Consistent with the institution of behavioral rules regarding the appropriate treatment of copyrighted material participants were (1) given multiple exposures to the rules and expectations regarding appropriate behavior, (2) given opportunity to demonstrate understanding of the rules (3) apprised of the consequences of rule violation (4) asked to acknowledge their acceptance of the rules and (5) essentially left on their own regarding compliance (Cavusoglu et al. 2004; Doherty and Fulford 2005; Myyry et al. 2009; Siponen and Vance 2010). To ensure participants were aware of the rules regarding the proper use and treatment of intellectual property in general and copyrighted material in particular, our data collection was timed to follow two pedagogical events.

The foremost event was completed 10 days prior to our experiment – the participants’ completion of 5 one-hour information literacy modules taught as part of the university requirements. The objective of the literacy modules is to support the development of the requisite research skills needed to succeed at the university level. Relevant to this research, these 5 instructor-delivered modules specifically addressed the rules regarding the appropriate treatment of intellectual property and copyrighted material – with special emphasis placed on digital material.<sup>1</sup> In addition to the introduction of the rules and training, all study participants were presented with the University Student Code of Conduct approximately 4 weeks prior to the experiment. Coverage of the code was delivered using a participatory style that involved numerous examples of appropriate and inappropriate use and treatment of intellectual property and included ample opportunity for students to ask clarifying questions. Following the discussion, all students were asked to sign a pledge card that acknowledged (a) their understanding of the academic integrity rules as outlined in the code and (b) their willingness to abide by those rules.

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<sup>1</sup> The research and information skills course covered the following 5 one hour modules ending the week prior to our data collection. Information Ethics: Citing and Avoiding Plagiarism, Using Books for Research, Using Articles for Research (1), Using Articles for Research (2), Citing Tips and Tools, and Information Ethics: Copyright, Fair Use.

## Participants

The participants used in this study were all first semester freshman business students at a private mid-Atlantic university. One hundred eighty-eight students from two sections of an introductory business course were randomly assigned to one of four unique technology conditions detailed below. Of the initial 188 participants, 34 failed to complete the instrument used to assess cognitive moral development. Of the remaining 154 participants, 21 were removed for failing internal consistency checks based on their responses to the instrument. Of the remaining 133 participants, 15 failed to submit a response document for similarity assessment. Of the 118 candidate response documents, 13 documents were identified during outlier analysis as being 4 or more standard deviations below the mean word count. Inspection of these outliers confirmed a lack of good-faith-effort by the participant to complete the exercise resulting in removal from the sample. Thus, the final sample used in our analysis consists of 105 participants distributed across the four technology conditions. See Table 1 for details regarding the distribution of participants across conditions.

Table 1 – Summary Statistics

		<i>SI – Similarity Index</i>	<i>CMD – Cognitive Moral Devlp</i>	<i>TOE – Time on Exercise</i>	<i>WORDCNT – Word Count</i>	<i>TECHSAVY – Average IT Literacy</i>	
Overall Sample <b>N=105</b>		MEAN	14.41	30.46	46.50	390.89	8.88
		STD	20.21	13.76	11.87	140.68	0.96
<b>EXPERIMENTAL CONDITIONS</b>	Search only (TCs) <b>N=34</b>	MEAN	14.45	32.11	51.09	405.06	8.61
		STD	23.26	14.39	14.86	148.61	1.12
	Copy-Paste (TCcp) <b>N=25</b>	MEAN	16.45	32.91	42.64	403.32	9.09
		STD	18.94	11.41	8.33	143.49	0.88
	Copy-Paste + Search(TCcps) <b>N=22</b>	MEAN	23.46	23.43	45.23	399.59	9.09
		STD	21.93	8.68	10.98	143.94	0.82
	Control (TCo) <b>N=24</b>	MEAN	3.94	32.00	45.17	349.88	8.86
		STD	7.67	17.15	9.32	122.91	0.86

## Procedures

We examined our research questions using a between subjects design with data collection carried out over two sessions. The objective of the first session was to collect and measure rule violations in an in-lab exercise. The objective of second session was twofold – (1) gauge participants' cognitive moral development by assessing the degree to which they employed principled moral reasoning and (2) assess participants' proficiency with commonly used information technologies. All data collection was conducted in university sponsored computer labs.

To measure rule compliance under varying technology conditions, participants were randomly assigned to one of four unique technology capability conditions. Participants were instructed to access one of four specially constructed websites –one site for each technology condition. All participants were required to complete the same exercise; however, the technological capability of the website hosting the stimuli article was varied according to condition assignment. The exercise required participants read a short on-line article and submit an electronic response document containing essay responses to 4 article related questions. The participants were allotted 75 minutes to complete the exercise. A pretest of the exercise indicated that 75-minute time constraint was not an impediment to completion. Lastly, response documents were reviewed and edited by one of the authors to account for both false-positive and false-negative matches. The reviewed documents were converted to plain text and analyzed for occurrences of rule violations.



For purposes of empirical control, we assess participants' proficiency with commonly used information technology (such as word processors and Internet browsers) and technology features (such as text search and copy-and-paste) via a technology proficiency survey instrument. The technology proficiency instrument consists of 12 questions drawn from two existing technology proficiency surveys (Tesch et al. 2006; Bunz 2004). All questions used were directly related to the information technology required to complete the exercise.

## **Measures**

**Similarity:** Plagiarism is “the misuse of the writings of another author...include[ing] the limited borrowing, without attribution, of another[s] distinctive and significant research findings, hypotheses, theories... or interpretations’ (Fialkoff 1993: p. 56) Direct copying of information from a source, or the failure to credit a source for the authors’ original ideas both constitute plagiarism. However, as noted by many scholars (e.g., see Macdonald and Carroll 2007; Park 2003) the difficulty lies not in defining plagiarism but rather in its determination “for between imitation and theft, between borrowing and plagiarism, lies a wide, murky borderland” (Anonymous, 1997: p. 77).

In this study, we examine the misappropriation or misuse of text by assessing the degree of similarity between a submitted response document and a source document. While there is no universally agreed upon standard for what level of similarity constitutes plagiarism (Park 2003), we do believe that (1) a finding of plagiarism is increasing in similarity and (2) there exists a level of similarity at which the majority would conclude misconduct has occurred. We make no attempt or claim to classify any particular level of similarity as misconduct per se; rather, our objective in this research is to examine the role of information technology as an enabler of similarity and thus by extension, misconduct. Accordingly, we adopt the following measure of similarity – the quantity of extensive word-phrase matches occurring between participants’ responses to an in-lab exercise and a stimuli document.

The measure of similarity between a response and stimuli document was calculated using software from two different originality checking software products –*Turnitin Originality Checking* Web service published by iParadigm’s, LLC (iParadigms 2010) and *WCOPYFIND* published by L.A. Bloomfield and the Physics Department at University of Virginia (Bloomfield 2010). Each program has a nearly identical objective, viz., compare two documents and track the occurrence of inappropriately copied phrases. Both programs were configured to compare each response document in our sample against our control document to produce a measure of similarity referred to as a similarity index.

The similarity index is the percentage of words in the response document that match –word for word– passages in the control document. For example, if a 400-word response document contained 5 different 20 word phrases that were each found to be an exact match to phrases appearing in the control document, the similarity index would be 25%. Both programs were configured to detect and ignore all quoted text.<sup>2</sup> A high level of reliability was achieved between the two programs’ similarity index estimates (Krippendorff’s Alpha = 0.8695); therefore, an average of the two index scores was used in this research. To account for false-positives (i.e., common phrases or technical terms appearing in the control document that should not be flagged as inappropriate) we post-processed the similarity results to find occurrences of common phrases identified in the control document. This analysis resulted in 10 similarity score adjustments. Similarly, to account for false-negatives (i.e., phrases not flagged due to minor changes to otherwise inappropriately copied passages) we generated similarity results where the matched phrases were permitted to contain up to 2 word-level imperfections. To identify false-negatives, these results were then manually reconciled against the original results. This analysis resulted in 12 similarity score adjustments.

**Cognitive Moral Development:** We assess respondents’ level of cognitive moral development using Rest et al.’s (1999) Defining Issues Test, Version 2 (DIT2). Rest (1979; 1986) depicts the development of moral reasoning as distributional shifts where primitive forms of thinking about moral issues are replaced by more complex forms. Rest refers to these forms of thinking as moral schemas. The DIT2 is a device for activating moral schemas and provides measures of a respondent’s use of moral reasoning schema. Once complete, responses are subject to a series of analyses designed to assess a respondent’s use of moral

<sup>2</sup> For *WCOPYFIND*, the size of the word phrase is configurable parameter and was set to the control document’s average sentence length measured in words.

schemas. Relevant to this research is the measure that assesses respondents' use of a post-conventional schema (i.e., P Score). The P Score represents the percentage of times an individual selected arguments grounded in moral ideals and is thus reflective of the use of advanced or principled moral reasoning. (Andreoli and Lefkowitz 2009; Thoma 2006;). The P-score is considered to be a reliable and consistent measure of the use of principled reasoning (Thoma 2006). Thus, consistent with H1, we expect higher levels of CMD –as measured by the P Score– to be associated with *lower* levels of similarity.

**Technology Condition:** We operationalize the technology aspect of our research questions by varying the “amount” of technology available to participants for completion of the exercise. Our design makes use of one control and three technology groups. The technology conditions comprising the experimental conditions are none (i.e., the control condition – TC<sub>o</sub>), search only (TC<sub>s</sub>), copy-and-paste only (TC<sub>cp</sub>), and copy-and-paste plus search (TC<sub>cps</sub>). All participants received electronic access to the exercise by way of specially constructed web pages where the level of technology reflected their condition assignment.

Consistent with H2, we expect the technology conditions to be significant and positively associated with document similarity. In addition, and consistent with H3, we expect the introduction of the technology conditions to negatively moderate the influence of cognitive moral development on similarity scores.

**Control Variables:** In addition to the focal variables outlined above, we add several independent control variables that can logically be linked to additional unexplained variance in our model.

*Time on Exercise* – An increased sense of urgency may be associated with a decrease in socially desirable behavior. For example, Bettman et al. (1998) found that under strict time constraints, individuals accelerate their mental processing and do not take into account depth of information. Thus, we control for the time on exercise (TOE) measured as the number of minutes between the beginning of the session and the electronic submission time-stamp of the response document. We expect TOE to be a proxy for thoroughness in preparation of the answer and thus to have a negative relationship with SI.

*Submission Size* – We also control for the submission size using the number of words in the response document. Unlike time on exercise, an argument can be made for either a negative or positive association between word count and document similarity. If word count is positively correlated with time on exercise then a thoroughness argument can be made and we would expect a negative relationship with SI. If however, word count is negatively correlated with time on exercise then we might infer that the inflated word count reflects that “shortcuts” were taken and we would expect a positive relationship with SI.

*Technology Proficiency* – Participants who are more familiar with technology may have a skills-based advantage for higher levels of technology use (Lazonder et al. 2000). To account for the possibility that a disparity in technical ability plays a part in the final similarity scores we control for technological experience using the average score on the information technology skills instrument previously discussed.

## **Description of Sample**

Table 1 shows the descriptive statistics for our overall sample and for each of the four technology condition subsamples. The overall average similarity index is roughly 14 with a standard deviation of 20. This means on average, 14% of the words in a submitted response document come from word phrases that match a word phrase in the control document. The mean score for measure of CMD is 30.46 with a standard deviation of 13.76. Both statistics are consistent with published accounts of the schema scores reported in large sample studies by level of education (See for example Table 1 in Bebeau and Thoma 2003). We observe that the participants are equitably distributed across the four conditions with a range of 12 and every condition containing at least 22 observations. Consistent with the arguments laid out above, we note that the group means for similarity are increasing in technology condition with the greatest and most significant difference appearing between the means of copy and search ( $\bar{x}$  = 23.41) and the control ( $\bar{x}$  = 3.92) conditions ( $p < .001$ ). The overall average word size of response documents was 391 with a standard deviation of 141 and the overall average number of minutes spent on the exercise was roughly 47 with a standard deviation of 12. As one might expect given the sample used in this research, the average age of participants in our sample is 18.4 years with a very narrow range of 2.12 years and standard deviation of 0.48 years.

Examination of bivariate correlations reveals that collinearity is not a problem in our data and the correlations between the dependent and independent variables are in expected direction. The relationship

between our technology conditions and similarity are positive. Moreover, the strength of association between the dependent variable (similarity) and each of the technology conditions follows the predicted trend with the control group (TC<sub>o</sub>) displaying a negative correlation and the copy-and-paste plus search group (TC<sub>cps</sub>) displaying the highest positive correlation. Also as expected, CMD is negatively correlated with response document similarity.

### **Empirical Models**

To assess our hypotheses, we develop and test two models designed to evaluate the relationships among our measure of similarity, cognitive moral development and technology. First, we estimate a simple effects only model to explicate the mean effects of CMD and technology condition on similarity. Next, to assess how technology condition differentially impacts similarity, we extend our base model to include interaction terms involving cognitive moral development and technology condition.

**Base Regression Model:** We assess the relationship between document similarity, technology and moral development by means of multiple regression using a model having the following functional form:

$$SI_i = \beta_0 + \beta_1 CMD_i + \beta_{2-4} COND_{ji} + \beta_5 TOE_i + \beta_6 WORDCNT_i + \beta_7 TECHSAVY_i + \varepsilon_i. \quad (1)$$

Where, the dependent variable SI is the measure of similarity between the response-document for participant *i* and the control document. Of principal interest are our focal variables CMD and COND. CMD<sub>*i*</sub> is a measure of respondent *i*'s use of principled moral reasoning (i.e., P Score). COND<sub>*ji*</sub> is the *j*<sup>th</sup> technology condition to which respondent *i* has been assigned. For model estimation, COND enters the model as three reference-coded dummy variables where the control group serves as the reference group. The technology conditions used in this research are none (i.e., the control condition – TC<sub>o</sub>), search only capability (TC<sub>s</sub>), copy-and-paste only capability (TC<sub>cp</sub>), and copy-and-paste plus search capabilities (TC<sub>cps</sub>). The remaining independent variables are the control variables previously discussed – time on exercise (TOE), word count (WORDCNT), and technology proficiency (TECHSAVY).

**Extended Regression Model:** To test our moderation hypothesis, we extend the model in Equation 1 with CMD and interaction terms. Thus, we estimate a model having the following functional form:

$$SI_i = \beta_0 + \beta_1 CMD_i + \beta_{2-4} COND_{ji} + \beta_5 TOE_i + \beta_6 WORDCNT_i + \beta_7 TECHSAVY_i + \beta_{8-10} (CMD_i \times COND_{ji}) + \varepsilon_i. \quad (2)$$

The interactions enters the model as the product of CMD and each of the reference coded dummy variables reflecting the participant's assignment to one of the technology conditions (i.e., COND). All other Equation 2 variables are unchanged from Equation 1.

**Variable Transformations:** To account for a moderate degree of skewness in the similarity index measure, we applied a natural log transformation prior to the estimation of both models. In addition, to facilitate interpretation of our results as the overall average effect of cognitive moral development and technology condition on document similarity, we mean center all continuous independent variables. These transformations allow the coefficient for each of the base model technology condition dummy variables to represent the estimated mean similarity index difference between that condition and the control group when all other regressors are equal to their sample means. In the extended model, the interaction indicates how the mean similarity differences between the high and low technology conditions change given a one-unit increase in CMD (Hardy 1993).

## **Results**

Table 2 reports the results from the estimation of four nested regression models following from Equations 1 and 2 above. To confirm that our data is well suited for ordinary least squares (OLS) analysis we perform the following tests. Standard tests for correlated predictors (multicollinearity) revealed no significant problems in our data with all variance inflation factors below 3.1 and all intercept adjusted condition indices less than 3.7. Likewise, no evidence of non-constant variance of residuals (heteroscedasticity) was indicated ( $X^2 = 70.23$ ;  $p > .05$ ). Overall, the estimation of both Equations 1 and 2 results in an acceptable fit to the data with adjusted R<sup>2</sup>s exceeding 18% and 28% respectively.

### Base Regression Model Results

The results of the estimation of Equation 1 are shown in Table 2 columns 1 through 3. Each column reflects the estimation results from an increasingly complex model. This approach allows us to appraise whether a significant improvement in model fit is achieved through the addition of the explanatory variables. Column 1 reflects the results of a model comprised of only the control variables resulting in poor fit to the data ( $F=1.28$ ,  $p > .05$ ). Column 2 shows the results from a model that adds CMD. Unlike the previous model, the model fit to the data is significant ( $F=2.69$ ,  $p < .05$ ) explaining over 8% of the variance ( $R^2 = 8.4\%$ ). Column 3 shows the results from adding the COND dummy variables  $TC_s$ ,  $TC_{cp}$ , and  $TC_{cps}$  and thereby completing the Equation 1 model. The addition of the COND dummies results in a significant improvement in model performance over the previous model ( $F=5.20$ ,  $p < .05$ ) explaining over 18% of the variance in similarity ( $R^2 = 18.76\%$ ). In the succeeding paragraphs, we interpret the coefficients on our explanatory variables in terms of their influence on document similarity.

Table 2 – Regression Results

Variable	Description	Column 1	Column 2	Column 3	Column 4
Intercept		1.4924*** (.1661)	1.4960*** (.1628)	.6467 (.3265)	.6117* (.3116)
TOE	Time on exercise	.0083 (.0146)	.0125 (.0144)	.0170 (.0143)	.0249 (.0139)
WORDCNT	Word count	-.0012 (.0012)	-.0010 (.0012)	-.0016 (.0012)	-.0014 (.0011)
TECHSAVY	Average IT literacy	.3091+ (.1734)	.2668 (.1709)	.2140 (.1665)	.2387 (.1591)
CMD	Cognitive moral development		-.0274* (.0120)	-.0218* (.0111)	.0051 (.0183)
$TC_s$	Search only technology condition			.7089 (.4334)	.7363 (.4140)
$TC_{cp}$	Copy-Paste only technology condition			1.2969** (.4597)	1.5104*** (.4437)
$TC_{cps}$	Copy-Paste + Search technology condition			1.5158** (.4824)	2.0995*** (.5205)
$CMD \times TC_s$	CMD x Search only condition				-.0461 (.0262)
$CMD \times TC_{cp}$	CMD x Copy-Paste only condition				-.0916** (.0330)
$CMD \times TC_{cps}$	CMD x Copy-Paste + Search condition				.0530 (.0421)

**Table Notes:** \*, \*\*, \*\*\* represent p-values < 0.05, < 0.01, and < 0.001, respectively. Dependent variable is natural log of similarity index (SI). Continuous predictor variables are grand-mean centered. N=105.

**Cognitive Moral Development:** The CMD coefficient in column 3 reflects the effect of CMD on similarity after controlling for the remaining covariates. As our model is a log-linear we can interpret a one unit change in continuous predictor variable coefficients as a 1% change in similarity. Thus, in support of H1, the CMD coefficient is negative and significant indicating that that a one unit increase in CMD is associated with a 2.2% average decrease in similarity ( $\beta = 0.2192, p < .05$ ).

**Technology Condition:** The intercept coefficient represents the predicted log similarity for TC<sub>o</sub> (our control group) when all covariates are zero ( $\beta = 0.6467, p > .05$ ). Note that since we grand mean centered all predictors prior to estimation, a value of zero corresponds to the mean values. Thus, at the mean value of CMD there is no significant association between the control group and similarity. The remaining COND coefficients represent the change in similarity between each of the remaining technology condition groups and the control group. The TC<sub>s</sub> coefficient is not significant ( $\beta = 0.7089, p > .05$ ) indicating no significant difference exists between the search only condition and the control. The two remaining COND coefficients however are both positive and significant. The coefficient on TC<sub>cp</sub> reflects that similarity indexes for subjects assigned to this condition are 2.6 times ( $e^{1.2967}-1$ ) greater than similarity indexes for subjects in the control condition ( $\beta = 1.2967, p < .01$ ). Likewise, The coefficient on TC<sub>cps</sub> reflects that similarity indexes for subjects in the TC<sub>cps</sub> condition are 3.5 times ( $e^{1.5158}-1$ ) greater than similarity indexes in the control condition ( $\beta = 1.5158, p < .01$ ). As a formal test of H2, we compute the average effect of technology condition assignment and contrast it against the control condition. In support of H2, we find that average effect of technology condition assignment is significantly greater than that of the control condition ( $\beta = 1.1739, p < .01$ ).

**Control Variables:** Examination of the control variable coefficients reveals that none of the predictors is significantly associated with similarity. While the TOE coefficient is positive and in conflict with our expectations regarding sign, the coefficient fails to achieve significance ( $\beta = 0.0170, p > .05$ ). Considering the positive correlation between WORDCNT and TOE, we expected a positive association between WORDCNT and similarity. Contrary to our expectations however, the coefficient is negative although not significant ( $\beta = -0.0016, p > .05$ ). For participants well versed in the use of the technologies used in this study, we expected a positive association with similarity. While the TECHSAVY coefficient is positive, it also fails to achieve significance ( $\beta = 0.2139, p > .05$ ). Next, we examine the results from the estimation of our Equation 2 – our extended model.

Table 3 – Summary of Findings

<i>Hypothesis Description</i>	<i>Findings</i>
H1: The use of principled moral reasoning will be negatively associated with plagiarism.	Supported. A one unit increase in CMD decreases similarity by approximately 2.2% ( $\beta = 0.2192, p < .05$ )
H2: Information technology features designed to improve productivity will be positively associated with plagiarism.	Supported. The average effect of technology condition assignment is significantly greater than that of the control condition ( $\beta = 1.1739, p < .01$ ).
H3: The influence of principled moral reasoning in limiting misconduct will be moderated by the presence of information technology features designed to improve productivity	Not Supported.

### **Extended Regression Model Results**

Column 4 of Table 2 shows the results from the CMD–COND interactions in the Equation 2 model. The interaction model explains approximately 29% of the variance in similarity ( $R^2 = 28.67$ ). The addition of the interaction results in a significant improvement in model performance over our base model shown in

column 3 ( $F=4.35, p < .01$ ). In the estimation of Equation 2, the CMD coefficient is now conditioned upon technology condition assignment (Friedrich 1982). Thus, unlike column 3, the CMD coefficient in column 4 reflects the effect of CMD on similarity when the condition dummy variable is zero (i.e., for the control group alone) and is not significant ( $\beta = 0.0051, p > .05$ ). Next, we note that all COND dummies continue to reflect the estimated mean similarity difference between participants assigned to a technology condition and participants assigned to the control condition when CMD equals the value of its sample mean. The substantive interpretation of the technology condition coefficients remains unchanged from the estimation of Equation 1.

Recall that the mean differences in similarity between the condition dummy variables ( $TC_s, TC_{cp},$  and  $TC_{cps}$ ) and the control condition ( $TC_o$ ) are reflected in the coefficients  $\beta_{2-4}$ . The interaction coefficients ( $\beta_{8-10}$ ) reflect how these mean differences change given a one unit increase in CMD. In support of H3, the interaction coefficient for the  $TC_{cp}$  condition is negative and significant. Thus, as compared to  $TC_o$ , respondents in this technology condition experience a decrease in similarity of roughly 9% per a one unit increase in CMD ( $\beta_9 = -0.0916, p < .01$ ). In contrast, neither of the other technology condition coefficients is significant indicating that changes in CMD for these groups have a trajectory similar to the control condition. As a formal test of H3, we implement an orthogonal planned contrast to assess the direction and strength of the average effect of the interactions. Specifically, we test whether the average slope for each of technology conditions reflected by the interaction coefficients differ significantly from that of the control condition. While the contrasts value is in the hypothesized direction (negative), it is not significant ( $F=1.28, p > .05$ ). Thus, we conclude H3 is not supported. Refer to Table 3 for a summary of our findings.

## **Discussion and Implications**

Using a behavioral ethics lens, the research presented here examined the role cognitive and situational factors in explaining subjects' propensity to misappropriate text on a computer based task. Our findings support the contention that both the use of principled moral reasoning and the amount of technology at one's disposal have a significant role to play in explaining document similarity (i.e., text misappropriations) in our sample. In support of H1, we find that our measure of the use of a principled moral reasoning (CMD) is negatively associated with document similarity. Respondents who employed more principled moral reasoning were associated with roughly a 2.2% decrease in similarity scores. Recall, that an individual's current level of moral reasoning includes problem-solving techniques learned in earlier stages. Thus, a person perceives an ethical issue, judges, and behaves in accordance with the predominant socio-moral perspective learned through experience, education, and physical growth (Weber and Wasieleski, 2001). This implies that CMD may be impacted through education. Indeed, research has shown that ethics education has a significant positive influence on moral action (Luthar and Karri 2005). Our finding that increased CMD is associated with decreased incidents of similarity indicates that incorporating ethics education in business curricula may pay dividends when it comes to raising the ethical conduct of students. Relatedly, we found no support for our contention (H3) that the use of principled moral reasoning on document similarity would be significantly moderated by technology condition. One interpretation of this finding supportive of enhancing ethics education is that subjects possessing advanced moral reasoning made good decisions regarding inappropriate copying of text even when they had the technology available to do so.

In support of H2, our results indicate that technology condition assignment is a significant and positive predictor of document similarity. Contingent on the experimental condition assignment and level of technology available, increases in similarity scores are shown to exceed 3.5 times those of the control group. This finding raises concerns, as student use of information technology and Internet is unlikely to decline – in fact just the opposite (Auer and Krupar 2001). Given likely increases in both the use of technology by students and availability of digital content to students in the coming years, educators will need to adapt and find new and innovative ways to combat technology supported academic misconduct. Much like Lawrence Lessig's (1999) framework for managing and regulating cyberspace, the options available for mitigating technology-facilitated academic misconduct will involve manipulating the computer code, the laws, and social norms. For example, matching preventative technology with the facilitating technology could involve utilizing blocking and filtering systems student or university computers (Lathrop and Foss 2000). Interestingly, the same tools we used in our study to detect

similarity are tools with which faculty can discover and deter incidences of plagiarism. Coupled with meaningful punitive action against violators, this software could aid instructors in their battle to mitigate cheating. If students are made aware that such software may be used to verify the originality of their work, the perceived risk associated with plagiarism may rise to an inhibiting level.

Both behavioral instruction (Ackerman and White 2008) and the use of honor codes (McCabe et al. 2002) have been shown to mitigate academic misconduct. Moreover, to prevent plagiarism, common wisdom involves defining the concept explicitly to the students, and creating a discourse about desirable behavior and the policies that enforce the classroom policies (Auer and Krupar 2001). In our research setting, data collection was timed to follow the subjects' receipt of significant instruction regarding the treatment of intellectual property with special emphasis on the handling of digital materials. In addition, prior to our experiment all subjects discussed and signed the school's honor code specifically prohibiting plagiarism. Despite this, the incidence of misconduct in our study remained significant. There are several possible explanations.

One explanation may be that subjects in our study were simply undeterred by the rules and codes in place to mitigate dishonest behavior. In the music industry, new laws and litigation over piracy have arguably raised the awareness of the problem among the public (Mazar and Ariely 2006). Even so, studies have shown that piracy continues among a large percentage of the population (Von Lohmann 2004). This may in part be due to low levels of detection and/or enforcement resulting in a diminished sense of risk by violators. Perhaps the perceived risk of negative consequences by our subjects was also too low to be a deterrent. The behavior we observed may also be indicative of a cultural dimension in the academic environment, where the probability of detection is low enough to render honor codes impotent. Relatedly, lack of surveillance in the classroom, and thus diminished chances of detection, have also been associated with academic misconduct (Whitley 1998). While the subjects in our study were monitored during the exercise, the computer labs used were large with only a single instructor observing behavior. Moreover, observing specific behavior on a computer based task is even more difficult. Thus it is reasonable to assume that the threat of detection was low.

Another possible explanation for our findings may be related to our research setting. For example, employee decision making has been found to be moderated by an organization's ethical work climate (Victor and Cullen 1988). Work climates characterized by a "principled" ethical criterion foster individual independence and promote the adherence to organizational rules, procedures, and codes of conduct (Weber, et al. 2003). This type of climate is viewed as being the most morally preferred and the most likely to nurture honest and fair work environments (Wimbush and Shepard 1994). Given the empirical and conceptual relation between dishonest behavior in academic and business settings, perhaps the "classroom work climate" in our study had an effect on student behavior. While our sample was intentionally drawn from first semester student to mitigate culture based effects, future research should consider the ethical climate of research settings.

Lastly, it is possible that an explanation for our findings may be related to our sample selection strategy. Consistent with the idea that moral reasoning is learned behavior, research has shown that students increasingly perceive cheating to be more unethical as they age and progress through their academic careers (Elias 2009; Sims 1995). As previously discussed, subjects selected for our study were purposefully first semester freshman; thus, we must acknowledge that the early phase of their academic career may have had an effect on our results.

An additional, important, and often overlooked fact regarding academic misconduct is that student cheating is not a "victimless crime". Indeed, the leading victims may be the students themselves. Students who cheat deprive themselves of an opportunity to learn as learning often results from the struggles associated with the master of new material and intellectual skills (Whitley and Keith-Spiegel 2002). For example, in a recent study conducted at MIT, researchers found that students who cheated on assignments demonstrated significant reductions in learning as measured by final course grade (Palazzo et al. 2010). Moreover, peers who do not cheat are placed at a competitive disadvantage for both academic and employment opportunities – the latter implying that employers who hire academic cheaters are not getting what they pay for (Crown and Spiller 1998).

## Limitations and Conclusion

Our study is not without limitations. Unethical decision making resulting in some form of cheating is complex behavior. As noted by Kish-Gephart et al. (2010)

*“unethical choices ... cannot be explained by one or two dominant antecedents. Rather, they are multidetermined, with substrates spread widely, even within the distinct realms of individual, moral issue, and organizational environment characteristics.”* (p. 17).

In the research present here, we explored but two factors linked by theory to unethical decision making and academic misconduct. While we found statistical support linking both a person-level cognitive factor (cognitive moral development) and a situation-level factor (technology support) to our measure of misconduct, these factors accounted for only a moderate amount of the observed variance in our dependent variable. Although the explanatory power of our models is consistent with self-report studies of academic misconduct (cf. Stone et al. 2010; Whitley 1998), we believe future research should explore the expansion of models to examine additional factors including demographic, person-level, situation-level, and factors related to the ethical issue under study. For example, research has shown that several demographic factors are associated with academic misconduct. Crown and Spiller (1998) found higher incidents of cheating for students with lower self-reported GPAs. Prior evidence regarding gender differences on cheating is somewhat conflicted. Karabenick and Scrull (1978) found no gender differences in cheating behaviors while Iyer and Eastman (2006) found that male students are more likely to cheat. Similarly, several other person-level factors have been shown to influence ethical behavior. These include locus of control, ego strength, field dependence (Trevino 1986), and personal value sets (Nevins et al. 2007). Additional situation-level or contextual factors shown to influence ethical decision making in an academic setting are perceived likelihood of detection, perceived severity of penalties, and behavior of one's peers or significant referent group (Houston 1976; McCabe et al. 2002; Whitley 1998). Finally, characteristics of the issue itself, such moral intensity, have been shown to influence ethical decision making (Jones, 1991). Indeed, the nature of the ethical issue may be especially important for academic integrity as it applies to digital artifacts. For example, several studies of today's youth show that there is a near complete lack of recognition of or respect for intellectual property rights for digital media products such as music and movies (Freeman and Peace 2005; Friedman 1997). Such findings indicate that misappropriation of digital artifacts is likely to continue and perhaps worsen in the coming years.

We believe our study makes several contributions to the academic misconduct literature and also informs the ethics literature on dishonest behavior in academic settings. First, our experimental study is the first of its kind to examine the effects of an individual's cognitive moral development on the propensity to cheat on a computer based task. Secondly, to the best of our knowledge, our work is the first to study the influence of information technology features on a person's ethical behavior. This is important both for the information technology and the ethics fields. Given the proliferation of computer-based productivity enhancing tools, it is critical for scholars to identify and understand the effects of these tools on behavior. This study also has potential implications for business managers trying to curb rule violations in the workplace. Since there is a high reported correlation between classroom cheating and subsequent workplace behavior, this academic experiment is highly relevant to a business environment. If the causes and facilitating factors of cheating behavior are known, then the prospect of deterring this behavior in the classroom and workplace is promising. It is possible that an understanding of the antecedents and moderating factors of cheating behavior in academic environments will aid in our pursuit of more ethically consistent behavior in the workplace. While this was not emphasis of the present research, we do feel there is merit in future research exploring the types of individuals likely to break workplace rules.

In conclusion, we believe our study provides important insights into the effects of productivity enhancing technologies on unethical behavior in academia. The presence of such technologies is unavoidable and can only be expected to increase in the future. Academics can no longer afford to ignore the significant influence technology tools have on student academic misconduct. With the findings offered from this study, we hope the moral hazard facilitated by technologies can be minimized in academia by providing a better understanding of student's tendencies when placed in technology enhanced environments.



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