How is the ethical dissonance index affected by technology, academic dishonesty type and individual differences?

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Abstract

Academic dishonesty has been growing in both digital and analog settings. The present study aimed to generalize the ethical dissonance index (EDI), which was established in a sample of Israeli school students as the gap between the pervasiveness of academic dishonesty and its perceived legitimacy. Furthermore, the study examined how technology, dishonesty type and individual differences affect these factors. The study employed a scenario-based approach – an indirect strategy for deducing academic dishonest behaviors. Participants were 1055 school students from various grade levels, geographic locations and religious/ethnic sectors. Results regarding the role of technology revealed that, overall, digital academic dishonesty was less pervasive and deemed more legitimate compared to analog dishonesty. However, this relationship varied as a function of dishonesty type. Findings confirmed that students experienced some level of ethical dissonance, generalizing the EDI. Notably, individual differences did not affect the relationship between media, dishonesty type and the EDI.

Introduction

With the adoption of technology in academic institutions, academic dishonesty (AD) is vastly becoming a paramount concern (Knapp & Hulbert, 2017). This concern is especially relevant for e-learning environments, in which the unlimited access to information, as well as the unlimited ways to copy, edit and share with peers, might play a pivotal role in facilitating various dishonest behaviors. Crediting school students with some level of moral commitment and an awareness of ethical norms, the rise reported in the literature of AD might be accompanied by an ethical dissonance (Barkan, Ayal, & Ariely, 2015). Festinger's long-established theory of cognitive dissonance (Festinger, 1962) maintains that a gap between behaviors and attitudes might result in psychological discomfort, motivating a shift in either behaviors or attitudes so that they correspond. In academic settings, such a shift in behavior should manifest in a lowered pervasiveness of dishonest behaviors. However, recent studies testify that most students are involved in dishonest behaviors to some extent, with no reported drop in AD (Ison, 2014). This raises the

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Structured practitioner notes

What is already known

- Academic dishonesty is pervasive in both analog and digital media.
- Preliminary academic dishonesty studies which employed the EDI indicate that students who cheat experience an ethical dissonance.
- Dishonesty type plays a pivotal role in the relationship between media and academic dishonesty.

What this paper adds

- Generalizes the EDI to a representative sample of school students.
- Delineates specific relationships between media, dishonesty type and academic dishonesty.
- Examines the relationship between individual differences, media and the EDI.

Implications for practice and/or policy

- Effective interventions to negate academic dishonesty should to be media-tailored.
- In schools, older students as well as minority students experience the highest levels of dissonance, and should be targeted for interventions that promote awareness to its negative consequences.
- All students can benefit from replacing traditional assessment methods with assignments emphasizing the learning process and relying on intrinsic motivation.

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question—Are students in e-learning environments changing their attitudes to perceive AD as more legitimate? Or, are students constantly experiencing an ethical dissonance?

A recent study by Blau and Eshet-Alkalai (2017) measured the extent of the phenomenon of AD in a sample of eighth graders in Israel. The authors utilized Pavela's (1997) conceptual framework of AD types in order to compare various students' ethical violations. Pavela's comprehensive framework delineates four types of AD, intentionally conducted for achieving academic goals: (a) *Cheating*—using explicitly illegitimate information, data or aids. (b) *Plagiarism*– illegitimate copying and using data as one's own. (c) *Fabrication*—inventing false data or information. (d) *Facilitation*—aiding others in conducting dishonest behaviors. As this framework's development predates the wide integration of digital technologies in educational processes, it did not originally consider the effect of technology on these types of misconducts. In schools today, technology is inseparable from the learning process (Naydanova, Beal & Doty, 2018), and thus offers a rich environment to reexamine all of the components of Pavela's model, to identify both shared and distinct mechanisms for digital and analog AD types. Blau and Eshet-Alkalai (2017) were the first to directly compare the entire scope of Pavela's classification of AD in both non-digital (i.e. analog) and digital settings. Specifically, they utilized this framework to examine how technology influences AD, its pervasiveness, perceived legitimacy and the resulting dissonance, formulated in their study as the *Ethical Dissonance Index* (EDI). The study revealed a fundamental gap between the pervasiveness of AD and its perceived legitimacy beyond media (analog/digital). Moreover, the study demonstrated an interaction between media and types of AD, suggesting that dishonest behaviors were deemed more or less acceptable as a function of the media in which they were conducted. However, Blau and Eshet-Alkalai's (2017) study was conducted in a relatively small and homogeneous sample of students. Thus, the present study aimed to generalize these findings to a larger and more heterogeneous sample and to examine the EDI's relationship to technology and type of dishonest behavior. Additionally, the present study aimed to extend the understanding of the EDI by investigating whether it is influenced by individual differences (e.g. gender, grade-level, religious/ethnic sector) and their interaction with technology and type of dishonest behavior.

Technology, dishonesty type and the EDI

The literature on AD encompasses multiple types of dishonest behaviors that violate institutions' ethical norms and guidelines, aimed at undeserved gains, such as copying other students' work (Underwood & Szabo, 2003). This literature describes analog AD—pertaining to traditional pen-and-paper misconducts—as well as digital AD, in which advanced technologies are employed. Notably, digital academic dishonesty can be conducted using digital technology of any type, such as the Internet in general, as well as any digital device (e.g., laptop, tablet, smartphone) or online/mobile application (e.g., email, discussion group, texting app, social media app) in particular. See Table 1 for examples of analog and digital AD in the context of Pavela's four types of AD.

Overall, research indicates that students worldwide are continuously involved in unethical behaviors in both media (e.g. Saana, Ablordeppey, Mensah, & Karikari, 2016) despite being aware of its illegitimacy (e.g. Knapp & Hullbert, 2017; Molnar, 2015). Following Festinger's (1962) cognitive dissonance theory, students may be experiencing some degree of dissonance between their desire to maintain an ethical self-image and their desire to achieve higher achievements by committing these misconducts. In the context of education, Blau and Eshet-Alkalai (2017) defined the EDI as a measure of the magnitude of academic dissonance. Namely, the EDI has been shown to allow assessing the gap between one's perceptions of AD legitimacy and the tendency to actually commit AD. The larger the EDI, the higher the experienced ethical dissonance, potentially exposing the person experiencing it to negative psychological effects. Indeed, Blau and Eshet-Alkalai (2017) demonstrated variations in the extent of the EDI as a function of technology and dishonesty type.

Importantly, the large-scale digitalization of educational environments has been implicated in the well-reported rise in AD behaviors. Namely, the ability to copy, edit and share information via digital technologies facilitates and promotes AD (Conway, *et al.*, 2016; Underwood & Szabo, 2003). For example, Lanier (2006) surveyed a large sample of college students and found that self-reported cheating was higher in online courses compared to traditional in-class courses, implicating distance learning as a facilitator for cheating. Rowland, Slade, Wong and Whiting (2018) demonstrated how online services of "contract cheating" (i.e. online companies selling students ready-made academic works) manage to persuade students to engage in dishonest cheating and plagiarizing. However, is the medium itself the real culprit here? Stephens, Young and Calabrese (2007) analyzed university students' self-reports concerning digital and analog offenses. With the exception of plagiarism, their findings showed that students reported higher engagement in

Table 1: *Examples of analog and digital AD in the context of Pavela's framework (based on Blau & Eshet-Alkalai, 2017)*

	Analog	Digital
Cheating	Preparing a hand-written note containing exam material and using it during the exam	Saving exam material on one's smartphone and using it during an exam
Plagiarism	Copying classmates' homework from their notebook and submitting as one's own	Copying classmates' homework from their laptop and submitting as one's own
Fabrication	Inventing a personal experience based on data and pictures read in a printed book	Inventing a personal experience based on data and pictures read in an online website
Facilitation	Passing a friend hand-written notes with answers to exam questions during an exam	Text messaging a friend answers to exam questions during an exam

analog AD than in digital AD. In their study described above, Blau and Eshet-Alkalai (2017) did not find a main effect for technology, but an interaction effect, with only some types of AD more pervasive and perceived to be more legitimate in the digital medium. Thus, it may be that only particular types of AD are promoted by technology. Moreover, the studies mentioned were mostly conducted in higher education and it is important to differentiate between the impact of technology and dishonesty type in the context of education systems.

Following Blau and Eshet-Alkalai (2017), we employed Pavela's AD classification to examine the entire scope of dishonesty types and their relation to the EDI, as well as their interaction with technology. This led us to our first research question:

Q1: What is the relationship between the EDI and the media (analog/digital) within the four types of AD (cheating, plagiarism, fabrication and facilitation) in a heterogeneous population of school students representing the Israeli school system?

We expected to generalize the findings by Blau and Eshet-Alkalai (2017), demonstrating both the employability of the EDI to assess the extent of experienced dissonance, as well as an interaction between technology, dishonesty type and the EDI.

Individual differences and the EDI

Technologies play an integral part of the daily routine of the intended study population—school students in Israel in the years 2013–2015. However, ascribing homogeneous characteristics to this entire population due to their exposure to technology is misleading. The literature suggests that school students are not uniform in their relationship with technology (Dolan, 2016), and that technology is not necessarily a detrimental factor, but a facilitator (Helsper & Eynon, 2010). Thus, we expect that despite students' high familiarity with technology, individual differences that affect AD in general will also influence the EDI itself. Particularly, demographic characteristics, such as gender, age and religiosity, have been studied in the context of AD as predictive factors of its pervasiveness and its perceived legitimacy (e.g. Miller, Murdock, Anderman, & Poindexter, 2007; Yu, Glanzer, Sriram, Johnson, & Moore, 2017). However, to the best of our knowledge, these factors have not been examined in relation to the EDI. In this section, we will review some of the research literature regarding gender, age and religiosity, and their relationship to AD, to draw predictions for our second research question:

Q2: How do individual differences (gender, grade level and religious/ethnic sector) affect the EDI and its relationship to technology and dishonesty type?

Gender
Research has shown that males report on higher engagement in AD than females, and perceive it to be more legitimate (e.g. Sideridis, Isaousis, & Al Harbi, 2016; Hensley, Kirkpatrick, & Burgoon, 2013). While these findings are not conclusive (e.g. Wei, Chesnut, Barnard-Brak, & Schmidt, 2014), they do indicate that gender plays a role in the pervasiveness and perception of self-reported AD. The literature attributes gender differences in dishonesty to cultural reasons (Sideridis *et al.*, 2016), distinct socialization processes (Whitley, Nelson, & Jones, 1999), differentiated learning goals or the method of self-report (Newstead, Franklyn-Stokes, & Armstead, 1996). In line with this literature, we expected to find a correspondence between pervasiveness and legitimacy perception for both females and males: females were expected to engage less than males in AD, and to perceive it as less legitimate, and vice versa. Notably, a recent meta-analysis on gender and attitudes toward technology use in educational settings indicated less favorable attitudes for females compared to males (Cai, Fan, & Du, 2017). While this effect was relatively

small, it may transpire in technology being a moderator for the relationship between gender and the EDI.

Grade level
The vast majority of recent research on age and AD has focused on college and university students, with less attention given to school populations. However, reviewing the literature reveals a rise in dishonesty in the K-12 system up to undergraduates' classes, followed by a gradual decline as students become older (Miller *et al.*, 2007). Accordingly, we predicted a higher pervasiveness of AD in higher grade levels compared to lower ones. Concerning perceptions of the morality of ethical misconducts, literature on moral development suggests that the relationship with age is context dependent. Some morality components, such as prosocial reasoning (i.e. helping behaviors), show nonlinear relationships with age (Turiel & Nucci, 2017). However, moral reasoning, the basis for regulating behavior based on an evaluation of social situations against a moral criteria (e.g. deciding whether giving a friend answers to a homework assignment is considered facilitation), has been shown to develop linearly with age (Chiasson, Vera-Estay, Lalonde, Dooley, & Beauchamp, 2017). Correspondingly, for academic misconducts in particular, it has been suggested that as people become older and more mature, they also become more aware of the problematic nature of conducting AD offences (McCabe & Trevino, 1993). Thus, older students are expected to perceive AD as less legitimate than younger students, as they have a better understanding of the moral significance of these offences, regardless of the involvement of technology. Correspondingly, we expected to find a larger EDI with older students compared to younger students.

Religion/ethnic sector
In the present study, we look into three subgroups of schools, which differ in religious affiliation, degree of religiosity and ethnic background: Jewish (secular and religious) and Arab (Muslim and Christian). This multilayered subgrouping of religiosity and ethnicity allows for naturally occurring differentiation in levels of religious commitment and cultural effects. Religion affects socialization processes and enhances norm salience and moral decision making (Shariff, Willard, Andersen, & Norenzayan, 2016). However, research of the direct effects of religion on unethical behavior, and especially AD, is scarce, and findings are mixed. While some find a negative correlation between religion and AD (e.g. Rettinger & Jordan, 2005), others report on no relationship between these factors (e.g. Huelsman, Piroch, & Wasieleski, 2006) nor to perception of dishonesty (Godfrey & Waugh, 1998). While technology is often treated apprehensively by religious fundamentalists and traditional conservative groups, both Jewish (Barzilai-Nahon & Barzilai, 2005) and Arab (Mesch & Talmud, 2011), which could lead to lower exposure, reports show that technology use is quite prevalent even with the most religious groups in Israel (Barzilai-Nahon & Barzilai, 2005) and is increasingly embraced in Arab-speaking schools (Nachmias, Mioduser, & Forkosh-Baruch, 2010). Thus, the impact of religion on the EDI in the present study remains an exploratory question.

Method
Participants
The Israeli education system is divided on a cultural-linguistic basis, into Hebrew-speaking and Arabic-speaking schools. Hebrew-speaking schools include state secular, state religious and private, mainly ultra-orthodox schools. Arabic-speaking schools are divided based on their ethnic origin (e.g., Arab, Druse, Bedouin) Arabs, Druses, Bedouins) and/or the religion of students (e.g., Muslims, Christians). In all of these schools, students attend 12 grades over 12 calendar years:

six years in primary schools followed by six years in middle school and high school. Our sample consisted of 1055 school students studying in 40 classrooms (48.4% females), which forms a geographical and religious/ethnical representative sample of the Israeli school system. Grades included elementary school—up to 6th grade (26.9%), middle school—7th–9th grades (45.4%) and high school—10th–12th grades (27.7%). Among elementary schools, we included students aging between 10 and 12 (5th–6th grades) who are considered mature enough to understand ethical issues related to learning and assessment (Murdock & Anderman, 2006). Participants came from Hebrew-speaking schools—Jewish-secular (33.1%) and Jewish-religious (41.7%)—and from Arabic-speaking schools (24.5%). Notably, unlike Hebrew-speaking schools, all Arabic-speaking schools in Israel are classified according to their religious affiliation (Arab-Muslim, Arab-Christian, or Druzes). Representation of Arabic-speaking minority students in the study corresponds to their percentage in the population (Israeli Central Bureau of Statistics, 2017).

Instruments

Demographic Questionnaire: Data regarding grade level, gender and religious/ethnic sector were collected for all participants.

AD Questionnaire: Directly measuring dishonest behaviors, despite guaranteed anonymity, can result in biased responses due to participants' apprehension of negative social consequences (Gawronski & De Houwer, 2014). Thus, in the present study, we employed a scenario-based approach, modified from Jones' plagiarism scenarios (Jones, 2011). This approach serves as an indirect strategy for measuring and deducing academic dishonest behaviors. The scenarios chosen for the present study were validated previously by Blau and Eshet-Alkalai (2017). In the present study, participants completed an eight scenarios-based questionnaire, which corresponded with Pavela's (1997) four types of AD and two types of conducting dishonesty offences (digital and analog). Pervasiveness of dishonest behaviors was measured on a Likert scale ranging from 1 (not at all) to 7 (always) by asking participants: "to what extent is the behavior described in the scenario common among students in your class?" Perception of legitimacy was measured on a Likert scale ranging from 1 (definitely illegitimate) to 6 (definitely legitimate) pertaining to legitimacy, by the following question: "To what extent does the behavior described in the scenario seem legitimate to you?". To compare two scales, prior to analyses, the pervasiveness scale was transformed into a 1–6 scale using a linear transformation ($[Y = (B - A) * (x - a)/(b - a) + A]$, where a/b are the original minimum and maximum, and A/B are the new minimum and maximum values). This transformation was not expected to influence the data or its analysis (Knapp, 1990).

Ethical Dissonance Index: Following Blau and Eshet-Alkalai (2017), the EDI calculated as the gap between the measure of pervasiveness and the measure of perceived legitimacy for each dishonesty type and each medium, as follows:

$$EDI = pervasiveness - legitimacy$$

A positive EDI value suggests a higher pervasiveness of a dishonesty behavior than its perceived legitimacy, whereas a negative EDI suggests that a behavior is less pervasive than its perceived legitimacy, indicating a higher level of ethical awareness.

Procedure

The study was conducted in the years 2013–2015. Data were collected in classrooms. However, due to the sensitivity of the topic of research topic, students were supervised by a research assistant, without the presence of teachers or school officials, and were guaranteed full anonymity and confidentiality. They were instructed that there were no "correct" or "incorrect" answers

and were encouraged to freely express their own opinions and views. The questionnaires were translated from Hebrew to Arabic for the sake of the Arabic-speaking participants. Back and forth translation method was used to ensure the validity of the Arabic translation.

Results

Both overall scores of pervasiveness and perceived legitimacy were significantly different from the minimum base score ($p < 0.001$), confirming the pervasiveness of AD in our sample, along with the awareness of students that these behaviors are illegitimate. This gap resulted in the hypothesized positive EDI overall score ($p < 0.001$), validating this index in a large, heterogeneous population of Israeli students.

To examine the effect of media and dishonesty type on pervasiveness, perceived legitimacy and EDI of AD, we conducted three mixed ANOVA tests with two within-participants factors (Media: digital/analog; Dishonesty type: cheating/plagiarism/fabrication/facilitation). See Table 2 for descriptive statistics.

Pervasiveness
A significant main effect of media on AD pervasiveness was found, $F(1, 917) = 154.4$, $p < 0.001$, $_p\eta^2 = 0.144$, such that analog AD was more pervasive than digital AD. There was also a significant main effect for dishonesty type $F(3, 2751) = 87.96$, $p < 0.001$, $_p\eta^2 = 0.088$. Pairwise comparisons with Bonferroni correction demonstrated that cheating was significantly rarer than all other types of dishonesty ($p < 0.001$), while plagiarism, fabrication and facilitation did not differ. Finally, as hypothesized, there was a significant strong interaction effect between media and dishonesty type, $F(3, 2751) = 220.25$, $p < 0.001$, $_p\eta^2 = 0.194$. Paired t tests showed that cheating, fabrication and facilitation were more prevalent in the analog medium, while plagiarism was more prevalent in the digital medium (all p's < 0.01). These findings imply that the pervasiveness of AD in the two medium types varies as a function of dishonesty type.

Perceived legitimacy
A significant main effect of media on AD perceived legitimacy was found, $F(1, 931) = 184.59$, $p < 0.001$, $_p\eta^2 = 0.162$. Specifically, AD was perceived as less legitimate in the analog medium compared to the digital medium ($p < 0.001$). There was also a significant main effect for dishonesty type $F(3, 2793) = 29.6$, $p < 0.001$, $_p\eta^2 = 0.031$. Pairwise comparisons with Bonferroni correction demonstrated that the legitimacy of cheating and fabrication was similar, and both were perceived as more legitimate than plagiarism and facilitation ($p < 0.001$), which did not differ. Moreover, consistent with our hypothesis, there was a significant interaction effect, $F(3, 2793) = 67.51$, $p < 0.001$, $_p\eta^2 = 0.068$. Paired t tests revealed that cheating, plagiarism and facilitation

Table 2: *Means and standard deviations of pervasiveness, perceived legitimacy and EDI of AD as a function of media and dishonesty type*

	Cheating	Plagiarism	Fabrication	Facilitation	Total
Non-digital					
Pervasiveness	2.9 (1.5)	2.5 (1.4)	3.1 (1.4)	2.9 (1.5)	2.7 (1.1)
Legitimacy	2 (1.2)	2 (1.3)	2.4 (1.3)	2.1 (1.3)	2.1 (1)
Ethical Dissonance	0.9 (1.5)	0.5 (1.4)	0.7 (1.5)	0.8 (1.5)	0.6 (1.1)
Digital					
Pervasiveness	1.8 (1.1)	3.1 (1.4)	2.7 (1.4)	2.7 (1.6)	2.6 (1.1)
Legitimacy	2.8 (1.7)	2.3 (1.4)	2.4 (1.4)	2.2 (1.4)	2.4 (1.1)
Ethical Dissonance	−1 (1.6)	0.8 (1.5)	0.3 (1.5)	0.5 (1.5)	0.2 (0.8)

were perceived as less legitimate in the analog medium (p's < 0.001), while for fabrication legitimacy was similar in both media (p = 0.182). Overall, these findings again emphasize the importance of considering characteristics of specific dishonesty types.

EDI
Analysis revealed a significant strong main effect of media on the EDI, $F(1, 907) = 351.99$, $p < 0.001$, $_p\eta^2 = 0.280$, such that the gap between pervasiveness and legitimacy was higher for the analog medium compared to the digital medium ($p < 0.001$). Notably, separate EDIs significantly differed from 0, suggesting a positive EDI regardless of media (p's < 0.001). A significant main effect for dishonesty type, $F(3, 2721) = 96.78$, $p < 0.001$, $_p\eta^2 = 0.096$, was also found, as the EDI for cheating was lowest with a negative score, EDI for plagiarism and facilitation was the highest and did not differ (p's < 0.01), while EDI for fabrication was in the middle and significantly different than all other types. The hypothesized significant interaction effect, $F(3, 2721) = 232.56$, $p < 0.001$, $_p\eta^2 = 0.204$, revealed that the EDI was indeed higher for the analog medium in all dishonesty types apart from plagiarism, for which the EDI was lower in the analog compared to the digital medium (p's < 0.001).

Individual differences

Gender
An independent *t* test examined the effect of gender on the general measures of pervasiveness, perceived legitimacy and the EDI. As predicted and in line with the literature, the analysis revealed that dishonesty was less pervasive for females, and was perceived as less legitimate compared to males (p's < 0.001). Moreover, the EDI was also larger for males compared to females (p = 0.007) (see Table 3 for descriptive statistics). To examine the relationship between gender, media and dishonesty type on the EDI, we conducted a mixed ANOVA with media (analog/digital) and dishonesty type (cheating/plagiarism/fabrication/facilitation) as within-participants factors and gender as a between-participants factor (male/female). Despite adding gender to the model, the main effects and interaction effects for media and dishonesty type remained with similar direction and size, with no interactions between media, dishonesty type and gender (p's>.197).

Grade level
An ANOVA on pervasiveness and perceived legitimacy revealed significant differences between the grade levels. As expected, high school students had higher scores compared to middle

Table 3: Means and standard deviations for individual differences and pervasiveness, perceived legitimacy and EDI of AD

	Pervasiveness	Legitimacy	EDI
Gender			
Female	2.5 (1.0)	2.0 (0.8)	0.5 (0.8)
Male	2.9 (1.0)	2.6 (1.1)	0.3 (0.8)
Grade level			
Elementary	2.1 (1.0)	1.8 (0.9)	0.3 (0.7)
Middle school	2.7 (1.0)	2.3 (1.0)	0.4 (0.8)
High school	3.2 (0.9)	2.7 (1.0)	0.5 (0.9)
Religious/ethnic sector			
Jewish-secular	2.6 (1.0)	2.3 (0.9)	0.3 (0.8)
Jewish religious	2.6 (0.9)	2.3 (0.9)	0.3 (0.8)
Arab	2.9 (1.3)	2.3 (1.3)	0.6 (0.9)

school students, who had higher scores than elementary students, on both dependent variables (p's < 0.001). Comparing the EDI between the groups demonstrated that only high school students experienced a larger dissonance compared to the elementary school students ($p = 0.038$). To examine the relationship between grade level, media and dishonesty type on the EDI, we conducted a mixed analysis as described for gender, but with grade level as a between-participants factor. As with gender, the main effects and interaction effects for media and dishonesty type remained similar. There was a significant interaction between media and grade level, $F(2, 901) = 7.78$, $p < 0.001$, $_p\eta^2 = 0.017$, though with a very small effect size (we did not perform post hoc tests for significant yet weak effect sizes, as significance in this case is attributed to the large sample size rather than to a real effect). In addition, there was a significant interaction for dishonesty type and grade level ($F(6, 2703) = 25.19$, $p < 0.001$, $_p\eta^2 = 0.053$). An analysis for dishonesty types beyond media revealed that the EDI was larger with age for cheating and plagiarism ($p's \leq 0.022$). For fabrication, there was no difference between the groups ($p>.070$). Finally, for facilitation, high school students had a larger EDI than both elementary and middle school students ($p \leq 0.017$), who only marginally differed ($p = 0.056$). The analysis also revealed a significant three-way interaction effect, but the effect size was weak ($F(6, 2703) = 16.46$, $p < 0.001$, $_p\eta^2 = 0.035$).

Religious/ethnic sector

An ANOVA analysis for the religious/ethnic sector on the general measures of pervasiveness, perceived legitimacy and EDI revealed that in the Arab sector dishonesty was more pervasive than in both Jewish sectors ($p < 0.003$), which did not differ between themselves. Notably, there were no differences in the perceived legitimacy of dishonesty between the groups ($p = 0.999$). This was manifested in a larger EDI for the Arab sector compared to the other groups ($p < 0.001$), which did not differ. To examine the relationship between religious/ethnic sector, media and dishonesty type on the EDI, we repeated the mixed analysis as mentioned above, with sector as a between-participants factor. Main effects and interaction effects for media and dishonesty type remained with similar direction and size. There was no significant interaction between media and religious/ethnic sector ($p = 0.203$). A significant interaction for dishonesty type and sector and a three-way interaction had very weak effect sizes ($F(6, 2703) = 7.75$, $p < 0.001$, $_p\eta^2 = 0.017$, $F(6, 2703) = 2.69$, $p = 0.013$, $_p\eta^2 = 0.006$, respectively).

Discussion

The present study examined the EDI (Blau & Eshet-Alkalai, 2017), which represents the gap between the pervasiveness of AD and its perceived legitimacy, in the context of technology integration in the school system. The study was conducted with a large and heterogeneous sample of school students, allowing the investigation of sociodemographic characteristics as influencing the extent of the EDI as well as its relationship with technology and dishonesty type.

Overall, students in the study had positive EDI scores, suggesting that they conduct academic dishonest behaviors despite perceiving these behaviors as illegitimate. This confirms that mere understanding of the illegitimacy of AD behaviors does not necessarily prevent their execution, and parallels AD with other types of dishonest behaviors (e.g. Ayal & Gino, 2011). Specifically, people often strive to achieve goals (e.g. high grade) via dishonest behaviors, while being aware of the ethical violation involved. The ability to maintain their self-concept as "moral" people through committing these violations has been explained in terms of the magnitude of the violation, the ability to justify it or minimize its importance, social norms justifying dishonest behavior and the context in which the violation is conducted (Self-Concept Maintenance theory, Mazar, Amir & Ariely, 2008). In the particular context of AD, maintaining a self-concept has been related to minimizing personal responsibility, moral disengagement and perceived norms of prevalent

behaviors (Stephens, 2017). Importantly, our study illustrates the ethical dissonance experienced by students as a dimensional rather than a dichotomous factor, and offers a method for measuring its extent. We call future studies to examine its validity beyond population and context.

Our first research question (Q1) aimed at understanding the distinct relationship between the EDI, technology and type of AD. Despite common claims in the research literature that digital technologies facilitate acts of AD and are therefore partially responsible for the reported rise in pervasiveness of AD (Brimble, 2016; Sutherland-Smith, 2016), our findings indicate the opposite: Except for plagiarism, digital dishonesty was less pervasive in all dishonesty types. This finding is consistent with previous research, which found plagiarism to be the only dishonesty type more pervasive in the digital setting (Stephens, *et al*, 2007). These findings suggest that different types of AD are uniquely affected by technology.

One possible explanation for the complex relationship between technology and AD stems from the distinct characteristics of each dishonesty type and how it relates to incorporating technology in educational processes. Plagiarism, for example, has been directly associated with technology, due to the easy access to information and the ease of copying and pasting (Evering & Moorman, 2012; Ison, 2016), which makes data more easily accessible and transferrable than it is in the analog medium. Comparatively, other dishonesty types may be less susceptible to technological characteristics, at least in the context of schools. For example, both cheating and fabrication of data can be easily conducted in the analog setting, and are not necessarily facilitated by technological advancements. This is especially relevant in the Israeli school system, in which, despite the prevalence of technology-enhanced learning, most assessment processes are still conducted in the traditional analog setting. One could argue that facilitation (i.e. aiding others in their AD) might be prompted by technology, as utilizing social networks and digital devices makes data transferring easier compared to the analog medium (Conway, *et al.*, 2016). However, this might affect homework rather than examinations, which are conducted in the classroom. Clearly, further research is required to deepen our understanding of the relationship between AD and technology.

In light of our finding that analog dishonesty was overall more dominant than digital dishonesty, one might expect it to be perceived as more legitimate in order to minimize students' ethical dissonance. However, in correspondence with the theoretical assumption that students view digital dishonesty in a more forgiving manner (Ma, Wan, & Lu, 2008), we found that besides fabrication, all other types of AD were perceived as more legitimate in technology-enhanced learning and assessment. It is interesting to explore whether this trend will change as the involvement of technology in our daily lives grows, and people are further exposed to the repercussions of digital AD. Longitudinal research can be utilized to expose trend changes in the perceived legitimacy of digital dishonesty in general and of digital AD in particular.

An overview of these findings portrays a complex picture of the ways technology and dishonesty types are related to the EDI. The EDI was found to be affected by media, as students had higher EDIs in the analog medium compared to the digital one. Interpreting the source for the lower EDI in the digital medium requires looking at the interplay of its two components—pervasiveness and perceived legitimacy of AD. Namely, students experience less dissonance in the digital medium due to both the lower pervasiveness of AD and its higher perception of legitimacy. The interaction effect between media and dishonesty type strengthens this notion, as it shows that this effect is only different for plagiarism (i.e. higher EDI for the digital medium), which was found to be more pervasive in the digital than in the analog medium.

Our second research question (Q2) focused on examining the effect of individual differences (gender, grade level and religious/ethnic sector) on the EDI, and its relationship to technology and

dishonesty type. Notably, the relationship between the EDI, technology and dishonesty type was generally unaffected by any of the individual differences measured in this study. This suggests that the strength of these relationships seem to go beyond individual differences. However, examining the relationship between the EDI in itself and individual differences sheds important light on this phenomenon.

Our findings regarding *gender* were consistent with common findings in the literature on gender and self-reported AD (e.g. Sideridis, *et al.*, 2016; Wei, Chesnut, *et al.*, 2014), with females reporting lower pervasiveness of dishonest behaviors and considering these behaviors as less legitimate than males. Novel to the present study was the finding regarding gender and the EDI, with females experiencing a larger EDI compared to males. This finding suggests that males are not only more prone to conducting academic offences, they are also less likely to "suffer" their negative psychological consequences. Notably, media did not affect this relationship despite recent findings of females having less favorable attitudes toward technology compared to males (Cai, *et al.*, 2017). This finding is unique not only in the context of academic dishonesty, but also in the general context of ethical violations, and warrants further research.

The overall picture regarding *grade level* was consistent with the literature on dishonesty as a function of age in the K-12 education system. We found that with the advancement in age, students reported on more AD behaviors (Anderman & Midgley, 2004; Miller, *et al.*, 2007). This increase can be explained by the increase in the pressure to succeed and by internal and external expectations, as well as a larger impact of scholarly outcomes on students' academic future (Murdock & Anderman, 2006; Owunwanne, Rustagi, & Dada, 2010). Perceptions of legitimacy also increased with grade level. This could suggest that students adjust their attitudes to fit with their behavior (Festinger, 1962). However, we would then expect to see the EDI become smaller, or at least remain consistent across the grade levels. While this was the case for fabrication, for the other dishonesty types we found the opposite pattern, with the EDI increasing with the advancement in age, indicating an insufficient adjustment between behaviors and attitudes, resulting in older students experiencing more dissonance. This might make older students more susceptible to the negative psychological consequences associated with this dissonance.

With regard to *religious/ethnic* sector, we did not find a difference between the secular and the religious Hebrew-speaking students in any of our measures. It is possible that the discourse on ethical matters receives similar emphasis in the Israeli education system, regardless of the involvement of religion. The Arabic-speaking minority students did have a higher pervasiveness of AD. These findings are consistent with Peled and Khaldy (2013) who investigated dishonesty in Discipline Committees in Israeli academic institutions, and found that Arabic-speaking students had higher pervasiveness of alleged offences compared to their Hebrew-speaking peers. The authors suggested these groups experience higher pressure to succeed. Research on minority groups and non-native speakers found higher pervasiveness of AD in other countries as well (e.g. Kremmer, Brimble, & Stevenson-Clarke, 2007; Marshall & Garry, 2006). Importantly, there was no difference in the perceived legitimacy of AD between all of the groups, resulting in a much larger EDI for the Arabic-speaking group. This is notable as it suggests that these minority students experience a higher feeling of dissonance, which might not be acknowledged or dealt with by schools. Overall, it appears that some populations are more susceptible to experiencing a higher level of ethical dissonance, namely high school students and minority groups. It is highly important to examine whether this dissonance negatively affects the psychological well-being of the more susceptible groups. Finally, these relationships were not affected by media, suggesting that the potential apprehension of technology of the more religious/ethnic groups did not moderate either perceptions of AD or the tendency to commit it.

Conclusions

Our findings join the growing body of evidence indicating the high pervasiveness of AD in school settings, beyond the involvement of technology, and suggest that relying on students' knowledge of the rules is an insufficient strategy in negating this phenomenon. AD has been suggested to have harmful effects for students and educational institutions (Imran & Nordin, 2013), as assessment processes might reflect deceitful data regarding students' knowledge and skills. Moreover, its implications go beyond educational settings, as research has linked the pervasiveness of AD and perceptions of legitimacy to future workplace misconducts and their acceptance (LaDuke, 2013; Nonis & Swift, 2001). On the bright side, practical implications for coping and overturning this reality of AD can be drawn based on the complex relationship found in this research between technology and dishonesty type.

Our findings accentuate that any intervention to negate AD should be tailored to the media, digital or analog, to be effective. In the technology-enhanced environment, while most dishonesty types were less pervasive, their perceived legitimacy was higher. The use of technology in education offers new opportunities for engaging in AD, as well as creates a new set of illegitimate behaviors. However, the level of illegitimacy of these behaviors might be ambiguous to students (Higbee, Schultz, & Sanford, 2011). Thus, our findings suggest that educational interventions for the digital setting should focus on raising students' awareness to ethical issues, with a special focus on plagiarism, the only dishonesty type that was more pervasive in the digital medium. For the analog medium, it appears that students are more aware of the ethical issues related to AD, yet they continue to engage in these behaviors. Interventions in this medium can raise students' awareness to the harmful psychological effects of experiencing an ethical dissonance. This is especially relevant for older students and for minority students, as both of these groups experienced higher levels of dissonance.

From a pedagogical standpoint, *assessment methods* with a performance orientation emphasize grades and place enormous pressure on students to achieve higher grades. These methods have been implicated in a higher pervasiveness of AD, especially for high school students, as they feel that they must engage in dishonesty to get ahead (e.g. Murdock & Anderman, 2006; Sorgo, Vavdi, Cigler, & Kralj, 2015). Replacing traditional assessments with assignments that emphasize the learning process and rely on intrinsic motivation may help in reducing ethical violations for students, beyond individual differences. For example, Pulfrey and Butera (2016) proposed that mastery approach achievement goals promote competence acquisition and correlate with reduced AD, as well as a lower perceived legitimacy of AD. Namely, if students are self-motivated to deepen understanding in a learning subject of their choice, and are less concerned with grades, they may be less likely to engage in technology-enhanced dishonest behaviors, minimizing their ethical dissonance. Future research is required to employ these types of task assignments and examine their effect on the tendency for conducting analog and digital AD, and the effect on the experienced ethical dissonance.

We note that this study represents a certain point in time. As the involvement of technology in educational settings grows and becomes normative, the resultant pervasiveness and perceptions of digital dishonesty might alter. Thus, replicating this study in future may reveal a shift in the relationship between technology and the EDI.

Conflict of Interest

The authors have no conflict of interests.

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