



# Analogical Encoding Fosters Ethical Decision Making Because Improved Knowledge of Ethical Principles Increases Moral Awareness

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## Abstract

The current paper examines whether knowledge of an ethical principle influences moral awareness and ethical decision making. Using hypothetical scenarios (Studies 1 and 2) and a behavioral task (Study 3), three experiments examine the effects of deepening people's knowledge of ethical principles (conflicts of interest in Studies 1 and 3; safety in Study 2). In each study, an analogical encoding learning intervention led to greater knowledge of an ethical principle, which in turn resulted in a greater likelihood of moral awareness and making ethical decisions. These findings suggest that moral awareness is partly a matter of the depth of individuals' knowledge of ethical principles. The findings provide further reasons to link work on ethics with work on expertise and knowledge transfer as well as indicate new approaches to ethics training.

**Keywords** Ethical decision making · Knowledge of ethical principles · Moral awareness · Analogical encoding · Knowledge transfer · Expertise · Ethics training · Conflicts of interest · Safety

Well-intended individuals can fail to be morally aware, meaning they fail to recognize an ethical principle is relevant in a given situation (Reynolds and Miller 2015; Sezer et al. 2015; Tenbrunsel and Smith-Crowe 2008). A lack of moral awareness is a major contributor to making unethical decisions (Banaji et al. 2003; Hunt and Vitell 1986; Jones 1991; Rest et al. 1999). In developing the construct of moral awareness, Rest (1986, pp 5–6) noted the challenge of being morally aware: “many people have difficulty in interpreting even relatively simple situations... we must not underestimate the difficulty in interpreting social situations nor must we assume that all misinterpretation is defensive in nature.” This raises the question of how to ease people's difficulty with assessing social situations and so enhance their ability to recognize moral issues.

Recognition is founded on knowledge (Chase and Simon 1973). For example, research on learning and knowledge

transfer finds that to recognize a negotiation situation as an opportunity for forming a contingent contract, a key antecedent is learning what a contingent contract is (Loewenstein et al. 1999). To recognize a geological formation as an instance of a fault, a key antecedent is learning what a geological fault is (Jee et al. 2013). Bringing this learning and knowledge transfer perspective to the domain of ethics, perhaps recognizing that a decision is challenged by a conflict of interest hinges in part on learning what a conflict of interest is.

To examine the role of individuals' knowledge of ethical principles on moral awareness, the current studies borrow from studies of learning and knowledge transfer (Gentner and Hoyos 2017). Learning research shows that analogical encoding, or a form of training involving drawing comparisons between analogous examples to form a joint interpretation (Loewenstein et al. 1999), fosters developing a deeper knowledge of the principle illustrated by the examples (Alfieri et al. 2013). Greater knowledge of a principle is, in turn, linked to greater spontaneous noticing of the principle in new situations (Gick and Holyoak 1983). Consequently, this paper examines whether an analogical encoding learning intervention leads to greater knowledge of an ethical principle and thereby fosters spontaneous moral awareness.

Linking analogical encoding, knowledge of ethical principles, and moral awareness contributes to the behavioral

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ethics literature by adding a new antecedent to moral awareness (Reynolds and Miller 2015). It also offers useful prescriptive implications (Chugh and Kern 2016; Bazerman 2005) for designing ethics training interventions, as moral awareness fosters ethical decision making.

## Moral Awareness in Ethical Decision Making

Moral awareness is the first step in the ethical decision-making process (Rest 1986; see also Miller et al. 2014; Treviño et al. 2006). The central challenge of moral awareness is noticing the relevant moral issues at work in a given situation (Jordan 2007; Reynolds 2006). Not noticing ethical concerns and so not being morally aware raises the likelihood of amoral decision making (Tenbrunsel and Smith-Crowe 2008). This can lead people to act in ways they might, upon reflection, consider unethical (Chugh et al. 2005; Tenbrunsel et al. 2010).

Researchers often attribute a lack of moral awareness to motivational barriers (Bazerman and Tenbrunsel 2011; Tenbrunsel and Messick 1999, 2004; Tenbrunsel and Smith-Crowe 2008) and situational biases (Jones 1991; Tenbrunsel et al. 2003; Weaver and Treviño 1999). Motivations and situational biases can encourage people to form interpretations using knowledge that does not incorporate ethical concerns, resulting in a lack of moral awareness. A question then is whether individuals can learn (and then use) more appropriate knowledge.

Consistent with the possibility that learning matters, ethics training appears to increase moral awareness (e.g., Shawver and Miller 2017; see Watts et al. 2017 for a meta-analysis). However, this could be due to motivational or situational reasons rather than learning new knowledge. Most training programs include multiple components, generating uncertainty about what influences moral awareness, and few measure intervening processes. Most critically, most training studies use moral awareness measures that explicitly ask if there are any moral issues playing an important role in a situation. This makes them measures of *prompted moral awareness*, an individual's acknowledgment and ascription of importance to ethical issues in a given situation after being directed to consider ethics. Such prompted moral awareness measures are not measures of *spontaneous moral awareness*, an individuals' unprompted noticing of a relevant ethical principle in a given situation (Jordan 2007; Miller et al. 2014). Yet what fosters spontaneous moral awareness is the critical question for fostering ethical decision making in practice. Consequently, to contribute to research on ethics training, this paper seeks to identify a specific intervention, assess the intervening processes through which it works, and test its effects on spontaneous moral awareness so as to provide a building block for future ethics training programs.

## Knowledge of Ethical Principles as an Antecedent of Moral Awareness

The learning and knowledge transfer literature finds that when people fail to notice an important factor in a situation, it is often because they have not acquired adequate knowledge of the domain principles (Chi et al. 1982). For example, if employees make poor financial decisions, we might not only consider their financial motivations and situational temptations, we might also ask whether they lack financial literacy. Brought to the domain of ethics, perhaps insufficient knowledge of ethical principles contributes to limited moral awareness.

We define *knowledge of an ethical principle* as an individual's understanding of a schematic role structure governing a moral concern, following work in both ethics (Tenbrunsel and Smith-Crowe 2008) and learning and knowledge transfer (Goldwater et al. 2011). Taking this approach, we can describe a conflict of interest as an ethical principle specifying a situation structure in which a person's professional judgment can be compromised due to the existence of a competing personal interest (Beauchamp and Brenkert 2010; Carson 1994; MacDonald, McDonald and Norman 2002). Importantly, individuals can have complete, partial, or no knowledge of principles (Goldwater and Schalk 2016). Partial understandings might be that a conflict of interest is a form of bias or a state of having multiple goals. Partial understandings are also reflected in noting some conflicts of interest, such as taking a campaign donation from someone with business before the election winner, yet failing to notice others, such as companies paying for their own auditors (Duflo et al. 2013; Moore et al. 2005). Variable knowledge of principles is ordinary (Chase and Simon 1973), but a concern because it hinders noticing and applying those principles consistently (Gentner et al. 2009). Partial knowledge of ethical principles could be hampering ethical decision making, due to being one reason for a lack of moral awareness.

## Analogical Encoding: A Means to Develop Knowledge of Ethical Principles

The literature on learning and knowledge transfer indicates that one of the primary ways people develop knowledge of principles is through analogical encoding (Gentner et al. 2003), or learning by comparing seemingly different examples illustrating the same underlying principle (Alfieri et al. 2013). Analogical encoding tends to foster deriving principles, and deriving complete principles, from pairs of analogous examples (Gentner et al. 2009). Further, analogical encoding has been shown to foster durable learning,

not just temporary priming or shifts in activation (e.g., Fong and Nisbett 1991). If developing knowledge of ethical principles is like developing knowledge of principles in other domains, then it follows that analogical encoding learning interventions could facilitate forming knowledge of ethical principles.

Analogical encoding has advantages over studying examples individually. Although case-based materials are widely used in professional education (Falkenberg and Woiceshyn 2008), they tend to encourage learners to focus on one example at a time. However, individuals often have difficulty abstracting principles from individual examples because they tend to focus on the surface details (Gentner et al. 1993). Accordingly:

**Hypothesis 1** Comparing two examples of the same ethical principle is likely to lead individuals to form more complete knowledge of that ethical principle than studying the same examples separately.

### Knowledge of Ethical Principles, Moral Awareness, and Ethical Decision Making

Developing complete knowledge of ethical principles matters because it fosters noticing those principles in new situations (Alfieri et al. 2013). It does so by enabling people to notice similarities based on underlying principles rather than surface details (Loewenstein 2010).

Brought to the domain of ethics, the argument is that moral awareness is in part a matter of noticing the relevance of a specific ethical principle in a specific decision-making situation. If so, then the factors that enable people to spontaneously notice the relevance of a specific ethical principle will result in moral awareness for that specific principle. Thus, we predict that the more complete people's knowledge of an ethical principle is, the higher the levels of spontaneous moral awareness regarding that principle people should show in subsequent decision-making situations.

**Hypothesis 2** A more complete knowledge of a specific ethical principle will lead to a greater likelihood of spontaneous moral awareness in subsequent decision-making situations when that specific principle is involved.

Prior research on moral awareness suggests that moral awareness is linked to ethical decision making and behavior (Jones 1991; Rest 1986) and provides some empirical evidence (Gino et al. 2011). Spontaneous moral awareness is no guarantee of ethical decision making (Tenbrunsel and Smith-Crowe 2008). Still, spontaneous moral awareness gives people the chance to determine whether an ethical issue is important and to apply ethical principles they do endorse. Consequently, following prior literature, we expect that greater spontaneous moral awareness will lead to a greater likelihood of making an ethical decision.

Accordingly, an analogical encoding intervention is predicted to lead to more complete knowledge of an ethical principle, which in turn is predicted to foster spontaneous moral awareness for that principle and ethical decision making when that principle is relevant. This series of predictions results in a chain of effects as depicted in Fig. 1 and that we test in the studies that follow

**Hypothesis 3** The effect of comparing two examples of the same ethical principle on making ethical decisions is mediated in sequence by the knowledge of that ethical principle and by spontaneous moral awareness for that principle in the decision-making situation.

### Study 1

Study 1 tested individuals' knowledge of the conflict of interest principle and its influence on spontaneous moral awareness and ethical decision making. Many discussions of ethical decision making in organizations focus on the role of conflicts of interest (e.g., Bazerman et al. 2002; Duffo et al. 2013; Messick 2009). Thus, whether working adults understand, recognize, and make ethical decisions when confronted with a conflict of interest is an important question in organizational life.

In Study 1, participants in the intervention conditions read the same two cases of conflicts of interest. One group was asked to compare the cases. The other group studied the cases separately. As a reference point, we also included a baseline condition that received no intervention. All participants read a decision scenario, set in a new context, in

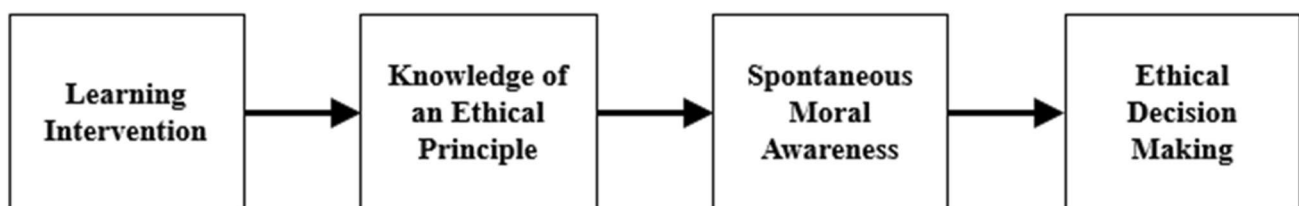


Fig. 1 Proposed and tested model

which there was a conflict of interest. The key questions were whether participants would notice the conflict of interest and whether they would make a decision that addressed the conflict of interest.

## Method

### Participants

A total of 252 individuals recruited on Amazon Mechanical Turk (MTurk) (62% male;  $M_{\text{age}} = 34.97$  years,  $SD = 11.18$  years, range 19–67 years) participated in exchange for \$1.25. Following recommended MTurk practices (Peer et al. 2014), we restricted eligibility to participants in the United States to reduce variance in understanding the scenarios. We set a sample size target in advance based on a power analysis using prior work and collected all the data before doing any analyses in this and the following studies. The participants had on average 12.80 years of work experience ( $SD = 10.76$  years, range 0–45 years; 96% had at least one year of work experience). Each participant was randomly assigned to the analogical encoding condition, separate cases condition, or no intervention condition.

### Materials and Procedure

After providing consent, participants in the analogical encoding and separate cases conditions went through an intervention phase. They read two cases of conflicts of interest (see Online Appendix A). One case concerned a mayor deciding on a company to install new parking meters. The mayor's son was the salesperson at one company, presenting a conflict of interest. The second case was about a researcher evaluating proposals for funding. One proposal was from an organization that had an ongoing employment relationship with the researcher, presenting a conflict of interest. The training cases (and decision scenarios) used in this study and the following studies were pretested for relevance and difficulty as well as verified through feedback from ethics instructors. In the analogical encoding condition, participants read both cases and were then asked: "In what ways are the two cases similar? Having thought about their similarities, now please use the space below to describe the key parallels between the two cases." In the separate cases condition, participants read the two cases one at a time and were asked, for each one: "Having thought about the case, now please use the space below to describe its key aspects."

In the decision phase, all participants, including those in the no intervention condition, read a decision-making scenario (see Online Appendix B). Participants imagined they were a fashion buyer at a department store chain and involved in a mentorship program. Their mentor was a senior person at a different company. The boss asked the mentee to

provide a recommendation about buying accessories from the company at which the mentor (unknown to the boss) happened to work. Participants were asked to decide what to say to their boss in response. Afterward, participants answered demographic questions.

Following recommendations for assessing spontaneous moral awareness, the study information, solicitation materials, study context, and scenario provided no superficial prompts to look for ethical issues, and the scenario provided some situational ambiguity (Jordan 2007; Miller et al. 2014). The question to write down what they would say follows Clarkeburn's (2002) recommendation to ask open-ended questions about what one would do next in a situation and then evaluate whether participants themselves indicate ethical issues in their responses (see also Yetmar and Eastman 2000). Thus, participants' responses provide the basis to assess spontaneous moral awareness.

## Measures

### Intervention Phase

**Knowledge of an Ethical Principle** Participants' open-ended statements about the intervention cases were coded for their completeness in expressing the conflict of interest principle. To be counted as complete knowledge (scored as a 2), statements could have described both the primary and secondary interests, noted their conflict, and noted the potential for the secondary interest to bias the decision. Alternatively, statements could have labeled the situation a conflict of interest, recommended disclosing the secondary interest, or recommended recusal from making the decision. To be counted as incomplete (scored as a 1), statements could have simply mentioned the secondary interest. To be counted as absent knowledge of the conflict of interest principle (scored as a 0), statements could have done none of these things. Both analogical encoding and separate cases condition participants' open-ended statements were coded. For the separate cases participants, their highest score across the two cases was used as a conservative measure of their knowledge. Two independent raters, one who was blind to the conditions and another blind to both the conditions and study hypotheses, coded these statements (Krippendorff's  $\alpha = 0.79$ , 95% CI [0.72–0.85]). They also coded the subsequent measures. In this and all other studies, each measure was coded separately, and statements were coded in a random order to minimize bias.

**Learning Time** As an estimate of participants' effort during the learning intervention, we measured the time spent reading the intervention cases and writing open-ended statements. It was used to assess whether differential effort helped explain the effects of the learning intervention.

**Decision Phase**

**Spontaneous Moral Awareness** Participants’ responses to the open-ended question regarding the decision scenario were coded for indications of a conflict of interest (Krippendorff’s  $\alpha=0.65$ , 95% CI [0.51–0.79]). Statements clearly indicating the conflict of interest (as outlined in the completeness of knowledge of an ethical principle measure) were coded as indicating principle-specific moral awareness (scored as a 2). Statements noting only general ethical concerns (i.e., honesty or fairness), which were not of primary relevance in the situation, were coded as indicating diffuse moral awareness (scored as a 1). The remaining statements were coded as indicating no moral awareness (scored as a 0). To facilitate comparisons to research using binary distinctions of moral awareness (rather than separating principle-specific moral awareness from diffuse moral awareness as our theory development indicated was appropriate), we provide supplementary results using a binary measure of spontaneous moral awareness (i.e., absence of moral awareness=0; diffuse moral awareness or specific moral awareness of the primary ethical principle=1).

**Ethical Decision Making** Participants’ responses to the decision scenario were assessed for whether the decision was or was not ethical (Krippendorff’s  $\alpha=0.76$ , 95% CI [0.59–0.89]). If participants recommended buying from the company with which they had a conflict of interest without disclosure, it was coded as not being an ethical decision (coded as 0). If participants explicitly disclosed that there was a conflict of interest, abstained from providing their opinion because of the conflict, or did not recommend buying from that company, it was coded as an ethical decision (coded as 1), following suggestions from prior literature (Boatright 2007; Beauchamp and Brenkert 2010; Moore and Loewenstein 2004). While there are questions about the efficacy of disclosure (Sah et al. 2013), as it continues to be widely prescribed, we included it as a form of ethical decision.

**Demographics** We assessed demographic information about gender (1 = male, 2 = females), age, and years of work experience. We did not predict that these demographic dif-

ferences would be related to the key variables of interest and so use them as control variables in robustness checks.

**Results**

**Knowledge of an Ethical Principle**

Table 1 provides descriptive statistics for the analogical encoding and separate cases conditions on the main and control variables. Consistent with Hypothesis 1, participants in the analogical encoding condition showed reliably more complete knowledge of the underlying conflict of interest principle than those in the separate cases condition ( $B=0.67$ ,  $SE=0.28$ , Wald  $\chi^2=5.64$ ,  $p=0.02$ ,  $R^2=0.04$ ). Including demographic variables and learning time as controls did not change the pattern of results in this analysis (or in any of the analyses in this paper; see Table 2). The training difference emerged because participants in the analogical encoding condition ( $M=1.06$ ,  $SD=0.98$ ) tended to articulate the conflict of interest principle more completely than participants in the separate cases condition ( $M=0.72$ ,  $SD=0.77$ ),  $t(179)=2.65$ ,  $p=0.01$ ,  $d=0.39$  (Table 3).

**Spontaneous Moral Awareness**

Consistent with Hypothesis 2, ordinal regression analyses showed that more complete knowledge of the conflict of interest principle shown in the intervention phase was linked to greater spontaneous moral awareness for that principle in a subsequent decision-making phase ( $B=0.99$ ,  $SE=0.25$ , Wald  $\chi^2=16.44$ ,  $p=0.00$ ,  $R^2=0.15$ ). Participants in the analogical encoding condition ( $M=0.46$ ,  $SD=0.82$ ) were more likely to show spontaneous moral awareness than participants in the separate cases ( $M=0.22$ ,  $SD=0.62$ ),  $t(179)=2.15$ ,  $p=0.03$ ,  $d=0.33$ , and no intervention conditions ( $M=0.06$ ,  $SD=0.33$ ),  $t(165)=3.90$ ,  $p=0.00$ ,  $d=0.64$  (Table 3).

In addition, we note here that a model using the alternative binary measure of spontaneous moral awareness also finds support for the effect of training condition on spontaneous moral awareness (Table 4). Indeed, we found parallel results using the alternative binary measure of spontaneous

**Table 1** Study 1: means, standard deviations, and correlations of the main and control variables for the analogical encoding and separate cases conditions ( $N=181$ )

	Mean (SD)	1	2	3	4	5
1. Knowledge of an ethical principle	0.90 (0.90)					
2. Spontaneous moral awareness	0.27 (0.66)	0.33**				
3. Ethical decision making	0.25 (0.44)	0.30**	0.69**			
4. Gender (1 = male, 2 = female)	1.52 (.50)	0.02	0.03	0.01		
5. Work experience (years)	12.80 (10.76)	0.24**	0.11	0.12	0.16*	
6. Learning time (seconds)	383.53 (348.34)	-0.01	-0.03	-0.02	-0.05	0.00

\* $p < 0.05$ ; \*\* $p < 0.01$

**Table 2** Studies 1, 2 and 3: regression results with control variables

	Knowledge of an ethical principle		Spontaneous moral awareness		Ethical decision making	
	<i>B</i>	SE	<i>B</i>	SE	<i>B</i>	SE
Study 1 ( <i>N</i> = 252)						
Gender	0.10	0.30	0.01	0.42	-0.17	0.57
Age	0.04	0.03	-0.09	0.05	0.08*	0.04
Work experience (years)	0.02	0.03	0.10	0.05	-0.05	0.04
Learning time (seconds)	0.00	0.00	0.00	0.00	0.00	0.00
Learning intervention	0.72*	0.30				
Knowledge of an ethical principle			1.04**	0.26		
Spontaneous moral awareness					4.19**	1.18
Pseudo <i>R</i> <sup>2</sup>	0.12		0.19		0.69	
Study 2 ( <i>N</i> = 253)						
Gender	-0.44	0.31	-0.15	0.32	-0.28	0.61
Age	0.00	0.03	0.02	0.03	0.00	0.04
Work experience (years)	0.01	0.02	0.00	0.02	0.03	0.04
Education level	0.03	0.12	0.00	0.12	-0.21	0.22
Learning time (seconds)	0.00	0.00	0.00	0.00	0.00	0.00
Learning intervention	0.83**	0.16				
Knowledge of an ethical principle			0.73**	0.21		
Spontaneous moral awareness					2.90**	0.37
Pseudo <i>R</i> <sup>2</sup>	0.20		0.15		0.80	
Study 3 ( <i>N</i> = 161)						
Gender	-0.13	0.30	-0.80	0.43	0.26	0.38
Age	0.03	0.02	0.01	0.03	0.00	0.02
Work experience	0.01	0.02	0.00	0.03	0.03	0.02
Education level	0.20	0.11	0.22	0.15	0.04	0.13
Learning time (seconds)	0.00	0.00	0.00	0.00	0.00	0.00
Learning intervention	1.08**	0.33				
Knowledge of an ethical principle			0.58*	0.28		
Spontaneous moral awareness					1.38**	0.36
Pseudo <i>R</i> <sup>2</sup>	0.17		0.10		0.19	

**Table 3** Studies 1, 2 and 3: mean (SD) levels of participants' knowledge of an ethical principle, spontaneous moral awareness and percentages making ethical decisions, by condition

	Study 1 ( <i>N</i> = 252)			Study 2 ( <i>N</i> = 253)			Study 3 ( <i>N</i> = 161)		
	Knowledge of an ethical principle	Spontaneous moral awareness	Ethical decision making (%)	Knowledge of an ethical principle	Spontaneous moral awareness	Ethical decision making	Knowledge of an ethical principle	Spontaneous moral awareness	Ethical decision making
Analogical Encoding	1.06* (0.98)	0.46* (0.82)	35.4*	1.57** (0.74)	1.16** (0.95)	55.2%**	1.23** (0.87)	0.31 (0.61)	40.3%*
Separate Cases	0.72 (0.77)	0.22 (0.62)	18.8	0.94 (0.80)	0.69 (0.92)	36.0%	0.77 (0.75)	0.18 (0.50)	23.8%
No Intervention	NA	0.06 (0.33)	19.7	NA	0.55 (0.87)	31.2%	NA	NA	NA

\**p* < 0.05; \*\**p* < 0.01 for the column contrast

NA: The no intervention condition only completed the ethical decision-making scenario. Study 3 did not include the no intervention condition

**Table 4** Studies 1, 2 and 3: supplementary regression results with the binary measure of spontaneous moral awareness

	Knowledge of an ethical principle		Spontaneous moral awareness		Ethical decision making	
	<i>B</i>	<i>SE</i>	<i>B</i>	<i>SE</i>	<i>B</i>	<i>SE</i>
Study 1 (N=252)						
Gender	0.10	0.30	0.12	0.42	0.18	0.56
Age	0.04	0.03	-0.09	0.05	0.08*	0.04
Work experience (years)	0.02	0.03	0.10	0.05	-0.04	0.04
Learning time (seconds)	0.00	0.00	0.00	0.00	0.00	0.00
Learning intervention	0.72*	0.30				
Knowledge of an ethical principle			1.04**	0.27		
Spontaneous moral awareness					6.29**	1.44
Pseudo $R^2$	0.12		0.21		0.73	
Study 2 (N=253)						
Gender	-0.44	0.31	0.01	0.33	-0.44	0.51
Age	0.00	0.03	0.01	0.03	-0.01	0.04
Work experience (years)	0.01	0.02	0.01	0.03	0.04	0.04
Education level	0.03	0.12	0.03	0.12	-0.20	0.18
Learning time (seconds)	0.00	0.00	0.00	0.00	0.00	0.00
Learning intervention	0.83**	0.16				
Knowledge of an ethical principle			0.86**	0.20		
Spontaneous moral awareness					4.54**	0.56
Pseudo $R^2$	0.20		0.16		0.70	
Study 3 (N=161)						
Gender	-0.13	0.30	-0.83	0.43	0.23	0.37
Age	0.03	0.02	0.01	0.03	0.00	0.02
Work experience	0.01	0.02	0.00	0.03	0.03	0.02
Education level	0.20	0.11	0.22	0.15	0.05	0.13
Learning time (seconds)	0.00	0.00	0.00	0.00	0.00	0.00
Learning intervention	1.08**	0.33				
Knowledge of an ethical principle			0.60*	0.28		
Spontaneous moral awareness					1.44**	0.45
Pseudo $R^2$	0.17		0.13		0.13	

moral awareness for all of the other relevant analyses in all the studies in this paper. These results are statistically smaller in magnitude than the main results we present using the theoretically motivated distinction between diffuse and principle-specific moral awareness, consistent with our use of that distinction. As a result, for the sake of brevity, we do not discuss these supplementary results individually in the following sections.

### Ethical Decision Making

Spontaneous moral awareness led to a greater likelihood of making an ethical decision ( $B = 1.90$ ,  $SE = 0.20$ , Wald  $\chi^2 = 88.37$ ,  $p = 0.00$ ,  $R^2 = 0.55$ ). Participants in the analogical encoding condition (35.4%) were more likely to make an ethical decision than participants in the separate cases condition (18.8%),  $\chi^2(1, N = 181) = 4.70$ ,  $p = 0.02$ , and participants in the no intervention condition (19.7%),  $\chi^2(1,$

$N = 167) = 4.85$ ,  $p = 0.04$ . Rates of ethical decision making in the separate cases and no intervention conditions were similar,  $\chi^2(1, N = 156) = 0.01$ ,  $p = 1.00$  (Table 3).

### Mediation Analyses

To examine the path from analogical encoding to knowledge of an ethical principle, spontaneous moral awareness, and ethical decision making, we used a serial mediation analysis with 5,000 bias-corrected bootstrap samples (Hayes 2013, model 6). The intervention condition (i.e., analogical encoding or separate cases) was entered as the independent variable, knowledge of an ethical principle and spontaneous moral awareness as the mediators (in that order), and ethical decision making as the dependent variable. Consistent with Hypothesis 3, there was a reliable indirect effect of analogical encoding on ethical decision making through knowledge of an ethical principle

and spontaneous moral awareness,  $b = 0.71$ , 95% CI [0.16–1.43]. Including demographic variables (i.e., gender, age, work experience) and learning time did not change the pattern of mediation results in this study ( $b = 0.71$ , 95% CI [0.17–1.45]) or any of the following studies.

Further, we have conducted another mediation analysis (Hayes 2013, model 4) including all three conditions to examine whether spontaneous moral awareness mediates the relationship between the condition and ethical decision making once including the no intervention condition. The condition (i.e., analogical encoding, separate cases, and no intervention) was entered as the independent variable, spontaneous moral awareness as the mediator, and ethical decision making as the dependent variable. Consistent with the previous results, there was a reliable indirect effect of condition on ethical decision making through spontaneous moral awareness,  $b = 0.28$ , 95% CI [0.04–0.56]. Our theory development leads to the expectation that this result is due to the analogical encoding condition outperforming the separate cases and no intervention conditions. Consistent with this expectation, an additional analysis collapsing those latter two conditions showed a reliable indirect effect ( $b = 0.71$ , 95% CI [0.31–1.25]), suggesting that analogical encoding condition outperforms other two conditions in driving the indirect effect of condition on ethical decision making through spontaneous moral awareness. Including demographic variables (i.e., gender, age, work experience) did not change the pattern of this result,  $b = 0.32$ , 95% CI [0.07–0.64].

## Discussion

Study 1 indicated that limited knowledge of an ethical principle is one reason individuals fail to be morally aware and make ethical decisions. The completeness of individuals' knowledge of an ethical principle was linked to spontaneously noticing an ethical principle was relevant. As the analogical encoding learning intervention shaped individuals' knowledge and was randomly assigned, this amounts to evidence of a causal role for knowledge of an ethical principle to foster moral awareness.

The key to the intervention effect appears to be drawing a comparison. Comparing two conflict of interest examples, relative to reading the same two examples one at a time, promoted more complete articulations of the conflict of interest principle. As those receiving no intervention performed similarly to those reading cases separately, the effects of analogical encoding on moral awareness and ethical decision making were not simply due to being provided with a learning intervention, but specifically a learning intervention encouraging comparison.

## Study 2

Study 2 provides a conceptual replication of the theoretical model with a different ethical principle, the safety principle. Safety is an ethical principle specifying an obligation to maintain the well-being of those affected by one's decisions and actions. Safety in the workplace is a major concern, including a major ethical concern, for organizations (e.g., Burke et al. 2011; Burke et al. 2002; Christian et al. 2009). This study was similar to Study 1 and employed a similar three-condition (analogical encoding, separate cases, and no intervention) between-subjects design.

In addition, Study 2 included three extensions beyond Study 1. First, previous research indicated that when people make unethical decisions due to a lack of moral awareness, they might make different choices upon reflection or when prompted into moral awareness (Chugh et al. 2005; Tenbrunsel et al. 2010). Accordingly, as a further indication of the role of spontaneous moral awareness, after participants reported their decisions, we explained the relevance of the safety principle to the specific situation and then asked participants to make a decision again given that knowledge. This post-awareness decision provided a measure of participants' endorsement of the ethical principle in the particular situation. The post-awareness decisions could reveal that the initial decisions were likely driven more strongly by a lack of spontaneous moral awareness than by a knowing choice to not abide by the ethical principle.

A second extension was to assess, once participants were given a prompt to consider ethics, the extent to which they acknowledged and ascribed importance to ethical issues. We will call this prompted moral awareness to distinguish it from spontaneous moral awareness. Presumably spontaneous and prompted moral awareness are distinct but related. For example, knowledge of an ethical principle might not only foster spontaneously noticing a principle, but it might also lead to more effectively appreciating the importance of that principle. Consequently, knowledge of an ethical principle might foster both spontaneous moral awareness and prompted moral awareness. For this reason, Study 2 included Reynolds' (2006) moral awareness scale as a measure of prompted moral awareness.

A third extension aimed to clarify the particular role of knowledge of an ethical principle on moral awareness. In practice, people's knowledge of ethical principles is likely related to their *moral attentiveness*, or the extent to which individuals self-report chronically perceiving and considering morality in their experiences (Reynolds and Ceranic 2007; Reynolds 2008), and their *moral identities*, or the degree to which individuals' self-concepts center on moral traits (Aquino and Reed 2002). Yet at least in theory, those



three aspects of leading a moral life are separable. Consequently, to help distinguish the effect of knowledge of an ethical principle on spontaneous moral awareness from other possible drivers of spontaneous moral awareness, Study 2 assessed moral attentiveness and moral identity so that their roles could be separated from the role of knowledge of an ethical principle.

## Method

### Participants

A non-overlapping sample of 253 individuals (53% male;  $M_{\text{age}} = 34.93$  years,  $SD = 10.59$  years, range 19–72 years) recruited on MTurk participated in the current study in exchange of \$1.25. The participants had on average 13.17 years of work experience ( $SD = 11.12$  years, range 0–55 years; 96% had at least 1 year of work experience). Each participant was randomly assigned to the analogical encoding, separate cases, or no intervention condition.

### Materials and Procedure

After providing consent, participants in the analogical encoding and separate cases conditions read two cases of the safety principle (see Online Appendix C). One case concerned a sales manager who asked an employee to work both a day and night shift with no break, which put the employee in danger due to fatigue. The second case concerned a restaurant chain with a policy to keep soup at a high temperature, posing a safety threat to employees and customers. As in Study 1, participants in the analogical encoding condition read the two cases (order counterbalanced) and compared them. Then, participants were asked for two correspondences across the cases and asked to describe their key parallels. Participants in the separate cases condition read the two cases one at a time, asked about two aspects of each case, and asked to describe the key aspects of each case.

In the decision phase, all participants, including those in the no intervention condition, were given a decision-making scenario set in a new context that included a safety issue (Online Appendix D). A plant manager had to choose between proposals from two different production lines (order counterbalanced). One was expected to produce a higher financial return, but it would require re-assigning the maintenance staff and so raised safety concerns. Participants were asked to select which project to pursue and to explain why they made that choice. Next, participants answered the prompted moral awareness measure. Then, in a post-awareness decision phase, they read why there was a safety issue. Then, participants were asked to make a decision again and explain why they made their decisions. Finally,

they responded to the moral identity, moral attentiveness, and demographic questions.

## Measures

### Intervention Phase

**Knowledge of an Ethical Principle** The quality of participants' open-ended statements about the intervention cases was coded using a 3-point scale to measure the level of knowledge of the safety principle. To be counted as demonstrating complete knowledge (scored as a 2), the statement had to describe the ethical implications of the managerial decision in the case(s) or explicitly mention the safety issue. Statements were coded as incomplete (scored as a 1) if they indicated an unspecified risk related to the decision or indicated a safety issue without specifying any relationship to the decision. A statement was coded as absent an account of the safety principle (scored as a 0) if it indicated none of these concerns. The analogical encoding and separate case condition participants' statements were coded by two independent raters who were blind to the conditions and study hypotheses (Krippendorff's  $\alpha = 0.89$ , 95% CI [0.84–0.93]).

**Learning Time** As in Study 1, the time participants spent in the intervention phase was measured.

### Decision Phase

**Spontaneous Moral Awareness** Participants' responses about the proposal they chose were coded for whether they articulated the safety issue to measure spontaneous moral awareness (Krippendorff's  $\alpha = 0.92$ , 95% CI [0.84–0.97]). Statements that choosing the project diverting the maintenance staff would cause safety issues in the transmission production line were coded as indicating moral awareness specific to the safety issue (scored as a 2). Statements mentioning safety or other ethical concerns without linking it to the consequences of their choice or to the maintenance staff were coded as indicating diffuse moral awareness (scored as a 1). Statements not mentioning safety or any other ethical issues were coded as indicating no moral awareness (scored as a 0).

**Ethical Decision Making** Participants' choice in response to the decision scenario was used to measure participants' ethical decision using a 2-point scale (Krippendorff's  $\alpha = 0.87$ , 95% CI [0.74–0.97]). If participants chose the safe option or said they would address the safety issue, it was coded as an ethical decision (1). If participants chose the option raising safety concerns without addressing those concerns, it was coded as not being an ethical decision (0).

**Prompted Moral Awareness** Prompted moral awareness was assessed using Reynolds' (2006) 3-item moral awareness measure (e.g., "There are very important ethical aspects to this situation", "This matter clearly does not involve ethics or moral issues", "This situation could be described as a moral issue.") on a 7-point Likert scale (1 = Strongly disagree, 7 = Strongly agree).

### Post-awareness Decision Phase

**Post-awareness Ethical Decision Making** After providing their responses to the decision scenario, we explained that the scenario included a potential safety issue related to the maintenance staff and again asked for their responses. As in the previous decision phase, participants' choices in response to the decision scenario were used to measure their post-awareness ethical decision making using a 2-point scale (1 = an ethical decision, 0 = not an ethical decision).

**Moral Identity** Moral identity was measured by the 10-item moral identity scale with both internalization (e.g., "Being someone who has these characteristics is an important part of who I am") and symbolization dimensions (e.g., "I am actively involved in activities that communicate to others that I have these characteristics") (Aquino and Reed 2002) on a 7-point scale (1 = Strongly disagree, 7 = Strongly agree; Cronbach's  $\alpha = 0.78$ ).

**Moral Attentiveness** Moral attentiveness was measured using the 12-item moral attentiveness scale (Reynolds 2008) (e.g., "In a typical day, I face several ethical dilemmas", "I regularly think about the ethical implications of my decisions") on a 7-point scale (1 = Strongly disagree, 7 = Strongly agree; Cronbach's  $\alpha = 0.90$ ).

**Demographics** We assessed demographic information about gender (1 = male, 2 = females), age, and years of work experience, and the level of education (1 = no schooling completed, 2 = some high school, 3 = high school graduate, 4 = some college, 5 = Associate's degree, 6 = Bachelor's degree, 7 = Master's degree, 8 = professional degree). We did not predict that these demographic differences would be related to the key variables of interest and use these as control variables in robustness checks.

## Results

### Knowledge of an Ethical Principle

Table 5 provides descriptive statistics for the analogical encoding and separate cases conditions on the main and control variables. Consistent with Hypothesis 1, analogical encoding led to reliably more complete knowledge of the safety principle than studying separate cases ( $B = 0.82$ ,  $SE = 0.16$ ,  $Wald \chi^2 = 27.31$ ,  $p = 0.00$ ,  $R^2 = 0.18$ ). On average, participants in the analogical encoding condition ( $M = 1.57$ ,  $SD = 0.74$ ) articulated the safety principle more completely than participants in the separate cases condition ( $M = 0.94$ ,  $SD = 0.80$ ),  $t(174) = 5.41$ ,  $p = 0.00$ ,  $d = 0.82$  (Table 3).

### Spontaneous Moral Awareness

An ordinal regression showed support for Hypothesis 2: the more complete participants' knowledge of the safety principle was, the more likely they were to show spontaneous moral awareness in a subsequent decision-making situation ( $B = 0.87$ ,  $SE = 0.20$ ,  $Wald \chi^2 = 19.52$ ,  $p = 0.00$ ,  $R^2 = 0.14$ ). Participants in the analogical encoding condition ( $M = 1.16$ ,  $SD = 0.95$ ) were more likely to show spontaneous moral awareness than participants in the separate cases condition ( $M = 0.69$ ,  $SD = 0.92$ ),  $t(174) = 3.36$ ,  $p = 0.00$ ,  $d = 0.50$

**Table 5** Study 2: Means, standard deviations, and correlations of the main and control variables for the analogical encoding and separate cases conditions ( $N = 176$ )

	Mean (SD)	1	2	3	4	5	6	7	8	9
1. Knowledge of an ethical principle	1.26 (0.83)									
2. Spontaneous moral awareness	0.81 (0.95)	0.35**								
3. Prompted moral awareness	4.85 (1.49)	0.26**	0.55**							
4. Ethical decision making	0.41 (0.49)	0.24**	0.85**	0.53**						
5. Gender (1 = male, 2 = female)	1.47 (0.50)	0.08	0.08	0.06	0.08					
6. Work experience (years)	13.17 (11.12)	0.09	0.12	0.14*	0.1	0.06				
7. Education level	5.21 (1.35)	0.05	0.03	0.13*	-0.04	0.12	-0.12			
8. Learning time (seconds)	313.99 (283.61)	0.01	0.00	0.06	-0.03	0.13	-0.01	-0.04		
9. Moral identity	4.83 (1.02)	0.06	0.11	0.21**	0.06	0.14*	0.12	0.05	0.16*	
10. Moral attentiveness	3.87 (1.17)	0.01	0.07	0.19**	0.12	0.01	0.04	0.19	0.11	0.42**

\* $p < 0.05$ ; \*\* $p < 0.01$

and no intervention condition ( $M = 0.55$ ,  $SD = 0.87$ )),  $t(162) = 4.31$ ,  $p = 0.00$ ,  $d = 0.67$  (Table 3).

### Ethical Decision Making

Spontaneous moral awareness was linked to making ethical decisions ( $B = 2.76$ ,  $SE = 0.28$ , Wald  $\chi^2 = 98.21$ ,  $p = 0.00$ ,  $R^2 = 0.77$ ). Participants in the analogical encoding condition (55.2%) were more likely to make an ethical decision than participants in the separate cases condition (36.0%),  $\chi^2(1, N = 176) = 6.55$ ,  $p = 0.01$ , and participants in the no intervention condition (31.2%),  $\chi^2(1, N = 164) = 9.56$ ,  $p = 0.00$  (Table 3). There was little difference between the separate cases and no intervention conditions,  $\chi^2(1, N = 166) = 0.42$ ,  $p = 0.52$ .

### Mediation Analyses

To examine Hypothesis 3, we conducted a serial mediation analysis with 5,000 bias-corrected bootstrap samples to examine the pathway from intervention to ethical decision making (Hayes 2013, model 6). The intervention condition (i.e., analogical encoding, separate cases) was entered as the independent variable, knowledge of the safety principle and spontaneous moral awareness as the mediators (in that order), and whether an ethical decision was made as the dependent variable. There was a reliable indirect effect of the analogical encoding intervention on ethical decision making through the level of knowledge of the safety principle and moral awareness,  $b = 0.34$ , 95% CI [0.14–0.61]. Further, the indirect effect held after entering learning time,  $b = 0.34$ , 95% CI [0.13–0.62]. The indirect effect also held after entering moral identity,  $b = 0.34$ , 95% CI [0.16–0.68] (internalization only,  $b = 0.35$ , 95% CI [0.16–0.74]; symbolization only,  $b = 0.35$ , 95% CI [0.16–0.74]) and moral attentiveness,  $b = 0.36$ , 95% CI [0.18–0.75] as covariates. Thus, the effects of analogical encoding appear separate from individuals' moral identities and moral attentiveness, and are not just a matter of time spent on the learning intervention.

An additional mediation analysis (Hayes 2013, model 4) including all three conditions showed consistent results. The condition (i.e., analogical encoding, separate cases, and no intervention) was entered as the independent variable, spontaneous moral awareness as the mediator, and ethical decision making as the dependent variable. The results showed a reliable indirect effect of condition on ethical decision making through spontaneous moral awareness,  $b = 0.66$ , 95% CI [0.26–1.13]. Our theorizing indicates that this effect is likely to be driven by the analogical encoding condition, and after collapsing the separate cases and no intervention conditions there was still a reliable indirect effect ( $b = 1.52$ , 95% CI [0.83–2.45]), suggesting that the analogical encoding condition outperforming the other two conditions is what drives

the indirect effect of condition on ethical decision making through spontaneous moral awareness. The indirect effect held after entering moral identity internalization,  $b = 0.68$ , 95% CI [0.25–1.22], moral identity symbolization,  $b = 0.68$ , 95% CI [0.29–1.19], or moral attentiveness,  $b = 0.65$ , 95% CI [0.26–1.15] as a covariate.

### Distinguishing Spontaneous and Prompted Moral Awareness

We conducted additional analyses to demarcate the role of prompted moral awareness and so shed additional light on spontaneous moral awareness. Prompted moral awareness was correlated with spontaneous moral awareness ( $r = 0.55$ ,  $p < 0.01$ ). Knowledge of the safety principle predicted prompted moral awareness ( $B = 0.60$ ,  $SE = 0.16$ , Wald  $\chi^2 = 13.73$ ,  $p = 0.00$ ,  $R^2 = 0.08$ ). Prompted moral awareness was also related to ethical decision making ( $B = 1.07$ ,  $SE = 0.15$ , Wald  $\chi^2 = 53.31$ ,  $p = 0.00$ ,  $R^2 = 0.39$ ). Still, prompted moral awareness and spontaneous moral awareness do seem different, as indicated in Table 5. There were no significant correlations between knowledge of the safety principle or spontaneous moral awareness and moral identity or moral attentiveness. But prompted moral awareness was significantly correlated with both moral identity ( $r = 0.21$ ) and moral attentiveness ( $r = 0.19$ ).

### Post-awareness Ethical Decision Making

After being told about the safety issue, 79.3% of the analogical encoding participants, 68.5% of the separate cases participants, and 70.1% of no intervention participants supported making an ethical decision. These levels are not reliably different across conditions. An exact McNemar's test of the within-subject effect shows that these levels are considerably higher than those making ethical decisions initially (55%, 36%, and 31%, respectively) in all three conditions,  $p = 0.00$ .

This pattern of pre- and post-awareness ethical decision making is consistent with the possibility that about three quarters of the participants across conditions would have made an ethical decision on the first round of decision making if moral awareness had not been an issue, and that the analogical encoding learning intervention influenced participants' knowledge of the ethical principle, not their endorsement of that principle.

### Discussion

Study 2 found further support for linking analogical encoding, knowledge of an ethical principle, spontaneous moral awareness, and ethical decision making with a new set of intervention cases and new decision scenario embodying a

different ethical principle. As a result, Study 2 replicated and extended the findings from Study 1.

Study 2 provided additional support for knowledge of an ethical principle as a key predictor of spontaneous moral awareness and ethical decision making. By measuring and controlling for moral identity and moral attentiveness and continuing to find a clear link between knowledge of an ethical principle and spontaneous moral awareness, Study 2 indicates that one's general stance towards moral issues is not the same as one's depth of understanding of specific ethical principles when it comes to spontaneously noticing those principles are relevant.

Additionally, Study 2 separated the effect of moral awareness from the endorsement of the ethical principle on ethical decision making. Analogical encoding and knowledge of an ethical principle predicted spontaneous moral awareness, but had no effect on whether individuals endorsed the ethical principle by supporting a decision complying with it.

Finally, Study 2 showed that spontaneous and prompted moral awareness were distinct. Prompted moral awareness was correlated with spontaneous moral awareness and had similar relationships with knowledge of an ethical principle and ethical decision making. However, because prompted moral awareness was related to moral identity and moral attentiveness and spontaneous moral awareness was not, noticing that something is present is separable from believing it to be important. Spontaneously noticing moral issues appears to be more a matter of participants' knowledge of ethical principles than how much they care about ethics in general.

### Study 3

Study 3 used a behavioral task with financial stakes, complementing the earlier studies using decision scenarios. When real or apparent financial conflicts of interest are present, even advisers who want to give sincere advice can find it difficult to do so (Moore et al. 2006; Sah 2012). The experimental setting in Study 3 included a financial conflict of interest to provide a stronger test of whether knowledge of an ethical principle fosters moral awareness and ethical decision making.

### Method

#### Participants

A non-overlapping sample of 161 individuals (57% male;  $M_{\text{age}} = 37.34$  years,  $SD = 12.21$  years, range 19–77 years) recruited on MTurk participated in the current study. The participants completed the study for \$1.25, plus the opportunity for a bonus reward of \$1. The participants had on

average 15.94 years of work experience ( $SD = 11.85$  years, range 0–50 years; 97% had at least 1 year of work experience). Participants were randomly assigned to either the analogical encoding condition or separate cases condition.

### Materials and Procedure

After providing consent, in the intervention phase, participants read the conflict of interest cases used in Study 1 (order counterbalanced) and asked similar questions as in Study 2. In the decision phase, participants engaged in "The Investment Simulation" task (Online Appendix E). Participants played the role of investment advisers with a fiduciary responsibility to client investors. Participants were informed that client investors chose to pay a \$0.25 advisory fee to get access to their investment recommendation report. The participants were further told that client investors would have a chance of getting a bonus based on the profitability of their investment. The second group of participants was placed in the client investor role, as described shortly.

The second part of the conflict of interest situation was created by having one of the two startup companies (randomly assigned per participant) provide the participants with a bonus commission of \$1 if their client investor decided to invest in that company. Participants had to choose which company they would recommend to their client investor and write a recommendation report. Then, they were asked to explain why they provided their recommendation.

Afterwards, participants responded to the prompted moral awareness measure. They also completed a post-awareness ethical decision phase in which they answered additional questions about their decision after being informed about the conflict of interest at play in the investment simulation. Finally, they were asked questions about moral identity, moral attentiveness, and demographics.

### Measures

#### Intervention Phase

**Knowledge of an Ethical Principle** As in Study 1, the quality of participants' open-ended statements about the intervention cases were coded using a 3-point scale (0 = absent; 1 = incomplete; or 2 = complete) by two independent raters (Krippendorff's  $\alpha = 0.93$ , 95% CI [0.86–0.97]) who were blind to the conditions and hypotheses.

#### Decision Phase

**Spontaneous Moral Awareness** As in Study 1, participants' responses to the question asking why they provided a particular recommendation were coded for spontaneous indications that there was a conflict of interest (Krippendorff's

$\alpha = 0.69$ , 95% CI [0.48–0.85]). Statements clearly indicating the conflict of interest or indicating that they provided the particular investment recommendation due to the fiduciary duty as an investment advisor to the client were coded as indicating specific and complete moral awareness to the conflict of interest (scored as a 2). Statements involving general ethical concerns such as being honest, truthful or genuine, but not specifically indicating the conflict of interest in the decision-making situation were coded as showing diffuse moral awareness (scored as a 1). The remaining statements were coded as indicating no moral awareness (scored as a 0).

**Prompted Moral Awareness** As in Study 2, we used Reynolds' (2006) moral awareness measure using a 7-point Likert scale (1 = Strongly disagree, 7 = Strongly agree).

**Ethical Decision Making** Consistent with our measure of ethical decision making in Study 1, ethical decision making was measured by the startup company participants recommended and whether they disclosed their conflict of interest. If participants recommended the startup company that provided them the bonus commission and did not disclose the conflict of interest to the client investor in their investment recommendation report, it was coded as not being an ethical decision (scored as a 0). If participants either chose to recommend the non-conflicted startup company or disclosed the conflict of interest in their recommendation report, it was coded as being an ethical decision (scored as a 1).

To complete the scenario and to validate the measure of ethical decision making, we conducted a supplementary study with a non-overlapping sample of participants from the same population on MTurk ( $N = 240$ ; 58% male;  $M_{\text{age}} = 34.89$  years,  $SD = 10.67$  years, range 19–70 years). The participants had on average 13.17 years of work experience ( $SD = 11.71$  years, range 0–65 years; 95% had at least 1 year of work experience). They played the client investor role and were asked to invest in one of the two startup companies, with a chance of winning \$1.25. The participants did not have access to the information about the startup companies. They could choose to get access to an investment recommendation report from an investment adviser who received a \$0.25 advisory fee. We found that 73% (175 out of 240) chose to get advice from an investment advisor. As the investment recommendation reports from the first-round advisor participants fell into four main types, the client investor participants were randomly provided with an ideal type investment recommendation report in one of the four main types, as these formed a 2 (conflicted choice vs. non-conflicted choice) \* 2 (disclosure vs. no disclosure) factorial design.

After making an investment decision, participants were given all the information that the investment adviser was

given in the main study, including the bonus commission, and asked to make a moral judgment about the recommendation provided by the investment adviser. Specifically, they were asked to indicate the extent to which they agreed that the investment adviser acted in a way that was: unethical (reverse-coded), biased (reverse-coded), trustworthy, professional, immoral (reverse-coded), appropriate, and objective on a 7-point Likert scale (1 = *Not at all*, 7 = *A great deal*). The seven items were averaged to create a scale of moral judgment ( $\alpha = 0.93$ ). An ANOVA found a significant overall effect of different types of recommendations on moral judgment of the recommendation,  $F[3, 171] = 13.92$ ,  $p = 0.00$ . Planned contrast tests showed that the participants judged the conflicted choice with no disclosure ( $M = 3.49$ ,  $SD = 1.56$ , 95% CI [3.01–3.96]) as less ethical than the other three types of recommendation; conflicted choice with disclosure ( $M = 4.52$ ,  $SD = 1.42$ , 95% CI [4.07–4.96]), or non-conflicted choice with ( $M = 5.46$ ,  $SD = 1.19$ , 95% CI [5.07–5.84]) and without disclosure ( $M = 5.08$ ,  $SD = 1.74$ , 95% CI [4.58–5.58]),  $t(171) = 5.81$ ,  $p = 0.00$ , supporting the validity of our measure of ethical decision making. Also, the 95% CIs of all the other three types of recommendations were all above the midpoint of 4 on the 7-point Likert scale, whereas the 95% CI of conflicted choice with no disclosure was below 4, which further suggest that the conflicted choice with no disclosure is considered unethical, whereas the other three types of recommendation are considered ethical.

### Post-awareness Decision Phase

**Post-awareness Ethical Decision Making** Similar to Study 2, once the participants finished the decision phase, they were told about the conflict of interest issue involved in the simulation task and asked to make a decision again. As in the previous ethical decision-making phase, participants' decisions in response to this question were used to measure ethical decision making using a 2-point scale (1 = ethical decision, 0 = not an ethical decision).

**Other Variables** As in Study 2, demographic information, learning time, moral identity (Cronbach's  $\alpha = 0.81$ ) and moral attentiveness (Cronbach's  $\alpha = 0.90$ ) were measured. These variables were used as control variables.

## Results

### Knowledge of an Ethical Principle

Tables 6 provides descriptive statistics on the main and control variables. Consistent with Hypothesis 1, participants in the analogical encoding condition articulated more complete knowledge of the underlying conflict of interest

**Table 6** Study 3: Means, standard deviations, and correlations of the main and control variables for the analogical encoding and separate cases conditions ( $N=161$ )

	Mean (SD)	1	2	3	4	5	6	7	8	9
1. Knowledge of an ethical principle	0.99 (0.84)									
2. Spontaneous moral awareness	0.24 (0.56)	0.19*								
3. Prompted moral awareness	4.74 (1.43)	0.13	0.31**							
4. Ethical decision making	0.32 (0.47)	0.04	0.35**	0.05						
5. Gender (1 = male, 2 = female)	1.43 (0.50)	0.03	0.12	0.05	0.00					
6. Work experience (years)	15.94 (11.85)	0.20*	0.1	0.06	0.16*	0.01				
7. Education level	5.34 (1.45)	0.15	0.15	0.01	0.07	-0.04	-0.06			
8. Learning time (seconds)	411.16 (337.71)	-0.14	-0.04	0.01	0.00	-0.01	-0.04	0.02		
9. Moral identity	4.85 (1.09)	0.00	0.09	0.24**	-0.04	0.12	0.09	0.02	-0.06	
10. Moral attentiveness	3.87 (1.40)	-0.09	0.11	0.28**	-0.02	-0.02	0.07	0.01	-0.05	0.32**

\* $p < 0.05$ ; \*\* $p < 0.01$

principle than those in the separate cases condition ( $B = 1.05$ ,  $SE = 0.30$ ,  $Wald \chi^2 = 12.22$ ,  $p = 0.00$ ,  $R^2 = 0.08$ ). On average, participants in the analogical encoding condition ( $M = 1.23$ ,  $SD = 0.87$ ) articulated the conflict of interest principle more completely than participants in the separate cases condition ( $M = 0.77$ ,  $SD = 0.75$ ),  $t(159) = 3.60$ ,  $p = 0.00$ ,  $d = 0.57$  (Table 3).

### Spontaneous Moral Awareness

Consistent with Hypothesis 2, ordinal regression analyses showed that more complete knowledge of the conflict of interest principle in the intervention phase was linked to greater spontaneous moral awareness in the subsequent investment simulation task ( $B = 0.64$ ,  $SE = 0.26$ ,  $Wald \chi^2 = 5.96$ ,  $p = 0.02$ ,  $R^2 = 0.06$ ). However, the level of spontaneous moral awareness shown by participants in the analogical encoding condition ( $M = 0.31$ ,  $SD = 0.61$ ) was not significantly greater compared to the participants in the separate cases condition ( $M = 0.18$ ,  $SD = 0.50$ ),  $t(159) = 1.52$ ,  $p = 0.13$ ,  $d = 0.23$  (Table 3). It is possible that the open-ended measure underestimated the level of spontaneous moral awareness in this study, because the financial stake could have influenced some participants who noticed the conflict of interest issue to refrain from acknowledging it in their statements.

### Ethical Decision Making

As predicted in Hypothesis 3, spontaneous moral awareness led to a greater likelihood of making an ethical decision ( $B = 1.34$ ,  $SE = 0.34$ ,  $Wald \chi^2 = 15.42$ ,  $p = 0.00$ ,  $R^2 = 0.16$ ). As a result, participants in the analogical encoding condition (40.3%) were more likely to make an ethical decision than participants in the separate cases condition (23.8%),  $\chi^2(1, N = 161) = 5.02$ ,  $p = 0.03$  (Table 3). This effect is largely

because participants in the analogical encoding condition (35.1%) were more likely to select the non-conflicted choice than participants in the separate cases condition (17.7%),  $\chi^2(1, N = 161) = 7.16$ ,  $p = 0.01$ .

### Mediation Analyses

We examined the full path using a serial mediation analysis (Hayes 2013, model 6). The intervention condition (i.e., analogical encoding or separate cases) was entered as the independent variable, knowledge of an ethical principle and spontaneous moral awareness as the mediators (in that order), and ethical decision as the dependent variable. There was a reliable indirect effect of analogical encoding on ethical decision making through knowledge of an ethical principle and spontaneous moral awareness,  $b = 0.07$ , 95% CI [0.01–0.18]. Further, robustness checks in additional models showed that the results held after controlling for moral identity,  $b = 0.07$ , 95% CI [0.02–0.20] (internalization only,  $b = 0.06$ , 95% CI [0.00–0.16]; symbolization only,  $b = 0.07$ , 95% CI [0.01–0.18]), for moral attentiveness,  $b = 0.07$ , 95% CI [0.02–0.21], and for learning time,  $b = 0.07$ , 95% CI [0.01–0.19].

### Distinguishing Spontaneous and Prompted Moral Awareness

To help understand the distinct role of spontaneous moral awareness as in Study 2, we also analyzed the effects of prompted moral awareness. Prompted moral awareness was correlated with spontaneous moral awareness ( $r = 0.31$ ,  $p < 0.01$ ). Prompted moral awareness was also correlated with moral identity ( $r = 0.24$ ,  $p < 0.01$ ) and moral attentiveness ( $r = 0.28$ ,  $p < 0.01$ ), but none of these three concerns were correlated with knowledge of the conflict of interest principle or ethical decision making (Table 6). This pattern

indicates that prompted moral awareness appears related to how much an individual generally finds ethical issues to be important. In contrast, knowledge of a specific ethical principle and spontaneous moral awareness are separable from these questions of felt importance and, at least in this situation, linked to ethical decision making.

### Post-awareness Ethical Decision Making

After participants were informed that the investment simulation task included a conflict of interest, 66.2% of the analogical encoding participants and 61.9% of the separate cases participants chose to make an ethical decision. An exact McNemar's test of the within-subject effect shows that these levels were considerably higher than those making ethical decisions initially (40% and 24%, respectively) in both conditions,  $p = 0.00$ , and not reliably different from one another. Thus, endorsement of the conflict of interest principle in this situation is a separate issue than spontaneous moral awareness for the principle, and analogical encoding fosters knowledge of the conflict of interest principle but has little effect on the endorsement of that principle.

### Discussion

With a behavioral task involving a vested financial interest, Study 3 found further support for linking analogical encoding, knowledge of an ethical principle, spontaneous moral awareness, and ethical decision making. This study provides stronger evidence that an analogical encoding intervention, by developing more complete knowledge of the conflict of interest principle than studying the same cases one at a time, allowed a greater proportion of individuals to live up to their own ethical standards.

Study 3 also provided indications about the key role of spontaneously noticing ethical issues in the ethical decision-making process. Spontaneous moral awareness was linked to knowledge of ethical principles and also to ethical decision making. In contrast, prompted moral awareness was not related to either one. Instead, prompted moral awareness was correlated with moral identity and moral attentiveness, whereas spontaneous moral awareness was not reliably correlated with either of them. Moral identity and moral attentiveness may not be enough to help people spontaneously notice the ethical issues in complex situations.

Finally, once the ethical issue was made apparent and so once the issue of spontaneous noticing was removed, individuals were more likely to make an ethical decision. These results support long-standing claims regarding the importance of spontaneously noticing the relevance of ethical issues in the ethical decision-making process, and provide

support for the role of knowledge of ethical principles as a key antecedent to spontaneous moral awareness.

### General Discussion

Three studies provided evidence that knowledge of an ethical principle fosters moral awareness. Participants given an analogical encoding learning intervention, relative to those who studied examples separately, developed more complete knowledge of an ethical principle. More complete knowledge shown in the intervention phase had effects later when people were making a decision in a new decision-making situation: it led to being more likely to display spontaneous moral awareness and a greater likelihood of making an ethical decision. Also, the results show that, when it comes to spontaneous moral awareness and ethical decision making, studying examples separately is hardly better than not being provided any training at all. The participants in the separate cases condition in Studies 1 and 2 showed similarly low rates of spontaneous moral awareness and ethical decision making as participants who received no training materials. As the learning interventions were randomly assigned, these studies indicate that knowledge of an ethical principle has a causal effect on spontaneous moral awareness. The consistent results with two different ethical principles and two types of tasks provide clear empirical support for linking knowledge of an ethical principle to moral awareness.

Additionally, our results showed a distinction between spontaneous and prompted moral awareness. To our knowledge, these are the first studies to assess both spontaneous and prompted moral awareness. There are theoretical reasons to believe these are not the same, and Studies 2 and 3 found differences. A possible read of these studies is that prompted moral awareness is related to how important morality is to one's self-concept and how chronically one thinks about moral issues, whereas spontaneous moral awareness is more driven by individuals' knowledge of ethical principles. To be clear, both spontaneous and prompted moral awareness seem to capture important aspects of the ethical decision-making process. Sometimes what is critical is whether we realize there is an ethical issue at play. At other times, we are directly asked "do you see any issues here?" and need to make an assessment. Knowledge of ethical principles seems critical to the first, and moral identity and moral attentiveness seem important to the second.

### Theoretical Implications

Linking knowledge of ethical principles to spontaneous moral awareness contributes to behavioral ethics research by encouraging a focus on people's knowledge of ethics and

by linking moral awareness to the general cognitive issues of learning and knowledge transfer. To know what is right and wrong, we need to know what goes into the ‘right’ category and what goes into the ‘wrong’ category. This, in turn, requires knowledge of ethical principles so as to interpret situations effectively. Consequently, a lack of knowledge of ethical principles can impair ethical decision making. Developing knowledge of ethical principles appears to be one way to ease people’s difficulty with assessing social situations so as to recognize the ethical issues at play.

More broadly, the current studies provide empirical support for a growing set of discussions around the importance of knowledge, skills, and abilities in the domain of ethics. The recent discussions about *ethical learning* (Chugh and Kern 2016) imply a concern for self-regulation regarding ethics. The current studies emphasized knowledge of ethical principles as an additional factor that could help people close the gap between their actions and their ethics. In addition, the suggestions developed under the heading of *ethical expertise* (Dane and Sonenshein 2015) represent a next step for taking the understandings studied here and adding the skills needed to carry out one’s ethical judgments in team and organizational settings. Together, these lines of work provide next steps in developing theory on how to promote informed ethical action in organizations.

## Limitations and Future Research

As with any research, the current exploration was limited by its methods and procedures. Assessing long-term outcomes in longitudinal studies awaits further research to provide stronger evidence of durable learning and knowledge transfer. Still, as prior work shows that training interventions like those used here reliably yield durable learning in a variety of domains (e.g., Chen and Klahr 1999; Fong and Nisbett 1991; Thompson et al. 2000), it is likely that the current interventions did as well. In addition, the current studies used diverse samples in terms of age and work experience. Still, future work could examine the effects of analogical encoding learning interventions on behavior in organizations.

The studies focused on two ethical principles and tested moral awareness regarding the recognition of those specific ethical principles in a given situation. Future research can extend these findings by examining different ethical principles. In addition, studies can examine whether it is possible to foster moral (or ethical) sensitivity: an individual’s broader cognizance of moral issues across multiple ethical principles (Reynolds and Miller 2015; Jordan 2007). The question is how to foster such moral sensitivity. One avenue is to design broader learning interventions to foster knowledge of systems of principles. A second avenue is to add possible learning interventions to complement analogical

encoding, such as studying contrasting examples of related principles (Moran et al. 2008), encouraging self-explanation (Chi et al. 1989), and providing domain vocabulary (Loewenstein 2014; Loewenstein and Gentner 2005; West et al. 1996).

A further question is what kinds of training materials best foster knowledge of ethical principles. The current studies used relatively brief examples of parties engaging in unethical behavior as training cases to compare. Classroom training interventions tend to use longer and more detailed cases, sometimes in combination with the abstract definition of principles. Corporate training interventions tend to use brief scenarios with images as well as text. Traditional folk teaching about ethics relies on parables—simple, short stories set in everyday life situations, or even fantastical situations. We do not yet know what approach fosters the learning and knowledge transfer of ethical principles.

## Practical Implications

In finding that promoting knowledge of ethical principles can improve ethical decision making, the current studies offer opportunities for ethics training. Rather than presuming that working professionals already know key ethical principles, ethics training interventions could be designed to develop such knowledge. Rather than presenting individual examples, analogical encoding offers a potentially useful design element for ethics training interventions. Considering the relatively modest effort and time required to design and implement analogical encoding training interventions, analogical encoding has the potential to be readily used in organization and classroom training efforts.

To leverage an analogical encoding approach, just providing multiple examples is not enough. Explicitly encouraging a comparison between examples matters. While multiple examples may seem unnecessary for the experts who usually design training interventions, generating multiple examples may seem to be an added burden, and asking people to compare two examples to draw out their commonalities may seem time consuming or unnecessary, the added effort of taking these three steps does seem to make a meaningful difference for learning and knowledge transfer.

## Conclusion

Discussions with business school faculty about teaching ethics tend to yield two responses: “our students are adults so they know right from wrong already” and “I can’t teach ethics. I don’t know anything about it.” One of these is very likely wrong, and our guess is that it is the first one. The present studies indicated a broad array of working adults have



incomplete knowledge of ethical principles. The studies also showed that an analogical encoding learning intervention tended to lead them to form more complete knowledge, to spontaneously notice that those principles were relevant, to make ethical decisions, and to make decisions they did not later want to change. Thus, this paper provides avenues for new research and new interventions to bolster individuals' ability to enact the ethics they espouse.

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## Compliance with Ethical Standards

**Conflict of interest** Jiyeon Kim has received research grants from the Center for Professional Responsibility in Business and Society.

**Ethical Approval** All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

**Informed Consent** Informed consent was obtained from all individual participants included in the study.

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