

## Case-Based Knowledge and Ethics Education: Improving Learning and Transfer Through Emotionally Rich Cases

Chase E. Thiel · Shane Connelly · Lauren Harkrider ·  
Lynn D. Devenport · Zhanna Bagdasarov ·  
James F. Johnson · Michael D. Mumford

Received: 29 April 2011 / Accepted: 14 October 2011 / Published online: 27 October 2011  
© Springer Science+Business Media B.V. 2011

**Abstract** Case-based instruction is a stable feature of ethics education, however, little is known about the attributes of the cases that make them effective. Emotions are an inherent part of ethical decision-making and one source of information actively stored in case-based knowledge, making them an attribute of cases that likely facilitates case-based learning. Emotions also make cases more realistic, an essential component for effective case-based instruction. The purpose of this study was to investigate the influence of emotional case content, and complementary socio-relational case content, on case-based knowledge acquisition and transfer on future ethical decision-making tasks. Study findings suggest that emotional case content stimulates retention of cases and facilitates transfer of ethical decision-making principles demonstrated in cases.

---

C. E. Thiel (✉) · L. Harkrider · L. D. Devenport · Z. Bagdasarov · J. F. Johnson  
Psychology Department, University of Oklahoma, 455 W. Lindsey Street, Dale Hall Tower,  
Room 705, Norman, OK 73019-2007, USA  
e-mail: cthiel@ou.edu

L. Harkrider  
e-mail: harky55@ou.edu

L. D. Devenport  
e-mail: ldeven@ou.edu

Z. Bagdasarov  
e-mail: zhannab@ou.edu

J. F. Johnson  
e-mail: johnsonjf@ou.edu

S. Connelly · M. D. Mumford  
Center for Applied Social Research, University of Oklahoma, 2 Partners Place,  
3100 Monitor, Suite 100, Norman, OK 73072, USA  
e-mail: sconnelly@ou.edu

M. D. Mumford  
e-mail: mmumford@ou.edu

**Keywords** Case-based knowledge · Case-based learning · Emotion · Ethical decision-making · Sensemaking

## Introduction

Ethical issues are complex, ambiguous, and generally difficult to navigate (Werhane 2002). One way to make sense of ethical issues is to reflect on similar past experiences. Reflecting on past experiences is an inherent process of decision-making (Dahl and Moreau 2002; Genter and Medina 1998; Ward et al. 2002) and has the potential to improve it (Kolodner 1992). Case-based knowledge is typically developed through storage of one's own experiences, but can also be accomplished by vicarious instruction, (e.g., case-based learning exercises) (Kolodner et al. 2003) that at its best, can result in varied, context-rich, and applicable domain-specific information retention (Kolodner 1992). Thus, there is pedagogical value in case-based learning methods that increase the number of available cases for future reflection (Kolodner 1997; Kolodner and Guzdial 2000).

Case-based knowledge is multi-faceted, consisting of multiple pieces of information from a stored case, such as goals, outcomes, critical causes, requisite resources, major contingencies, actions steps and timing, and actor affect (Mumford et al. 2001). These features of a case are important both for organizing the cases in one's knowledge base (Chen 2003) and for abstracting important principles from cases that form case prototypes (Dubitzky et al. 1997). Moreover, information about important case features and attributes typically demonstrates decision-making principles that can be abstracted and applied in the form of mental models to future, similar situations (Ferret and Glasgow 1997).

Reflection on one's own experiences or learned cases not only aids in accurately analyzing and understanding the ethical problem, but also facilitates retrieval of analogous principles or guidelines that can improve ethical decision-making (EDM) (Antes et al. 2011; Hammond 1990; Martin et al. 2011). Case-based methods are often used in ethics education as a way to produce this desired effect (Keefer and Ashley 2001; Richardson 1993; Williams 1992) because case analysis can provide decision-makers with realistic ethical case prototypes that can be applied to new ethical problems (Cagle and Baucus 1996; Falkenberg and Woiceshyn 2008; McWilliams and Nahavandi 2006).

Case-based knowledge is a flexible and adaptive form of knowledge that is easily applied to complex and ambiguous situations (Kolodner 1992, 1993). Accordingly, case-based learning activities are often used to facilitate instruction in complex or ill-defined problem domains such as EDM (Kolodner and Simpson 1989; Kolodner 1997), and evidence suggests that using case-based knowledge to solve real-world problems, as opposed to other knowledge forms, produces higher quality solutions (Mumford et al. 2002; Patalano and Siefert 1997). Clearly, it appears that there is merit in using case-based learning approaches to teach ethics.

The value of case-based learning in ethics education, however, is contingent on the quality of the cases themselves. Case-based knowledge must contain information relevant to the EDM process (Falkenberg and Woiceshyn 2008; Richardson

1993). It is widely accepted that high quality cases must be realistic, reasonably complex, and address issues analogous to the problem at hand (Easton 1992; Lynn 1999; Merseeth 1996; Urbanac 1998). One of the most important functions of cases is to promote sensemaking (Mumford et al. 2008) or critical thinking processes (Falkenberg and Woiceshyn 2008). Sensemaking in EDM is the process of gathering, integrating, and interpreting factors related to an ethical problem (Mumford et al. 2008; Sonenshein 2007). Mental frameworks are created during sensemaking, and the accuracy of these frameworks is facilitated by cognitive operations, including causal analysis, constraint analysis, and forecasting. Applied research suggests that sensemaking is a critical process of EDM (Brock et al. 2008; Caughron et al. 2011; Mumford et al. 2008; Sonenshein 2007). Thus, promoting EDM through case-based knowledge is likely to be facilitated via sensemaking. To promote sensemaking, case content should emphasize the full complexity of ethical problems, thus demonstrating those elements of the situation that are needed to perform sensemaking. However, few investigators have examined the relative importance of different types of case content.

### Emotional Content and Case Knowledge

Because real world ethical problems are conflict ridden, they can be expected to evoke emotional reactions. Yet, most cases are devoid of emotion content. Adding an emotion component to cases should increase case realism, enhance empathetic reactions in the reader, and thereby facilitate case-based learning. Actor affect or emotion is one source of information that is stored in case-based knowledge (Mumford et al. 2001) that has been shown to be a valuable source of contextual information in situational framing (Van Kleef 2009), especially when relevant socio-relational information is present in conjunction with an emotional experience (Steinel et al. 2008; Van Kleef 2009). In light of the emotional nature of ethical problems and evidence implicating the importance of emotions in EDM processes (Gaudine and Thorne 2001; Kligyte et al. 2009; Thiel et al. 2011), omitting the emotional component from cases might be expected to weaken acquisition and transfer of the remaining content. Emphasizing the emotional component of cases should enhance case-based ethical learning and transfer by more closely matching the attributes of real ethical problems. Further, cases containing emotional content for multiple actors may further enhance the ability of learners to identify with actors and remember the case. Thus, we hypothesize as follows:

**H1a:** Description of a primary case character's emotional reactions promotes case-based knowledge acquisition.

**H1b:** Description of the primary and secondary case characters' emotional reactions will further promote case-based knowledge acquisition.

### Emotional Case Content and Ethical Decision-Making

Not only may case-based learners acquire and store more knowledge from emotionally-tinged cases, this knowledge may also enhance EDM performance in

transfer situations. Transfer of information is generally accepted to be based on how similar the learning activity is to the actual environment in which the behavior will be expressed (Goldstein and Ford 2002). Cases have been useful in promoting transfer in an ethics context because they provide models for addressing ethical problems faced in one's work (Gentner et al. 2003; Taylor and Chi 2006; Taylor et al. 2005). Cases emphasizing features or attributes that are inherently meaningful to the learners and in which real-world principles are demonstrated should promote not only greater acquisition of material, but also transfer. Emotion is one such feature of cases that increases the likelihood that their lessons will be applied to new contexts (Blanchette and Dunbar 2001).

Emotion appears to play an important function in demonstrating inherent principles of EDM in cases. Emotion may also facilitate retention of important principles of sensemaking embedded in cases. Sensemaking in EDM, or formation of mental models representing the ethical situation, is promoted by recognition of causes, recognition of constraints and contingencies, and forecasting (Antes et al. 2011; Caughron et al. 2011; Martin et al. 2011; Mumford et al. 2008; Stenmark et al. 2010), which are similar attributes to those inherently stored in case-based knowledge. One might expect that case-based knowledge transfer would manifest itself in the ethics domain through engagement in sensemaking processes. We therefore propose the next set of hypotheses:

**H2a:** Description of case characters' emotional reactions in an ethical case example will promote performance on EDM transfer tasks as evidenced by higher quality sensemaking processes (i.e. recognition of critical causes, critical constraints, and forecast quality) and overall decision-ethicality.

**H2b:** Description of the primary and secondary case characters' emotional reactions in an ethical case example will promote better performance on EDM transfer tasks than for only the primary case character as evidenced by higher quality sensemaking processes (i.e. recognition of critical causes, critical constraints, and forecast quality) and overall decision-ethicality.

### Socio-Relational Case Content

"Good cases" in ethics education are realistic and descriptive (Falkenberg and Woiceshyn 2008; Lundberg et al. 2001; Richardson 1993; Rippen et al. 2002). These cases are compelling to the learner and motivate the learner to search for solutions to problems. This is in part because they provide social details such as character types, relationships between characters, environmental climate and culture (Urbanac 1998). While there are theoretical reasons to support the idea that providing more social context promotes case-based learning, no empirical investigations have looked at what types of contextual information are best to include. There is evidence to suggest that socio-relational information may enhance the effects of including emotional case content into case examples. Socio-relational information has been described as information about interpersonal relationships, norms, and emotional expressions (Van Kleef 2009). Socio-relational information significantly influences the way in which other's emotional reactions are processed

and responded to (Steinel et al. 2008; Van Kleef and Cote 2007). Because emotions are inherent in EDM, and because accurate representation of emotions is necessary to determine their potential effects (Gaudine and Thorne 2001), the socio-relational information necessary to interpret emotional reactions should also be highlighted in ethical case examples.

Socio-relational information can encompass many things, including power dynamics between characters. Power differentials and how characters deal with authority figures factor into EDM (Bommer et al. 1987; Trevino 1986), so descriptions of power differential is likely to be one especially important piece of socio-relational information to include in cases. For example, a graduate student's response to pressure to delete outlying data is more complicated and requires different steps if the pressure is coming from the student's advisor, rather than another graduate student. Power differentials factor into how one navigates the ethical environment. Socio-relational information of this type should help case-based learners better understand why emotions were experienced, expressed, and produced certain reactions. Thus we present the final set of hypotheses:

**H3a:** Case-based knowledge acquisition will be best when descriptions of case characters' include emotional reactions and power dynamics.

**H3b:** Performance on an EDM transfer task (e.g. sensemaking processes and overall ethical decision-making) will be best when descriptions of case characters' include emotional reactions and power dynamics.

## Method

### Design

Participants were given case-based learning exercises in a  $3 \times 2$  study design. The independent variables tested were actor emotion portrayed in the cases (primary actor emotions vs. primary and secondary actor's emotions vs. no emotion content) and socio-relational power case content (present vs. not present).

### Sample

The sample population was drawn from graduate students participating in a Responsible Conduct of Research (RCR) training course at the University of Oklahoma. One-hundred and twenty-six individuals agreed to take part in the study. The sample contained slightly more males (56%) than females (44%) with an average age across the sample of 28. Participants were drawn from the social (54%), biological (35%) and health (11%) sciences.

### Procedure

Trainees enrolled in a RCR ethics training course were asked to take part in the study as part of an ongoing effort to improve the effectiveness of ethics education

for scientists and academics. Trainees were told that the study activities were mandatory as part of the training program, but that they were not required to allow their data to be used for research. The informed consent process for the study took place at the beginning of the two-day training course and participants were also given an opportunity to decline consent at the beginning of the training module in which the study manipulations took place. Prior to starting the study, participants were briefly instructed on the general purpose and protocol. The study lasted approximately 1.5 h, which was the length of the experimental training module.

Participants received two envelopes of study materials. The first envelope contained two ethical case examples, in which case content varied by condition and two low-fidelity EDM transfer tasks. Low-fidelity refers to simulations that occur under conditions different than the actual conditions in which the task would normally be completed. For example, having someone demonstrate fixing a repairing engine on a paper-and-pencil would be a low-fidelity simulation of the actual task of repairing a car engine. Low-fidelity measures (Motowidlo et al. 1990) have been successfully used to assess a wide-range of skills and abilities (Christian et al. 2010). The order in which these cases and tasks were presented was counterbalanced within conditions. Participants were instructed to carefully read each of the ethical case examples and the low-fidelity tasks, and to answer the questions associated with the low-fidelity tasks. After completing these tasks, participants returned all materials to the study administrator (one of the course trainers) who provided them with the second packet of materials. The 2nd packet contained two knowledge measures (one for each case), addressing the extent to which participants remembered information about each of the ethical case examples, and a general reaction measure to the cases themselves. Participants were not allowed to look back at the materials from the first envelope. Once participants completed these three measures, they returned the study materials to the administrator.

### Case Examples

Two cases of an ethical nature were adapted for the purpose of this study. These cases, labeled *Big Pharma* and *Side Business*, highlighted ethical issues such as fabrication, falsification, mentor–mentee relationships, and bid and contract practices. Both cases were similar, in that the primary character was in a subordinate position of power (e.g. graduate student or postdoctoral student) in the research environment. However, the cases varied in terms of whether a positive or negative outcome was experienced by the primary character, allowing us to determine the effect of outcome valence on case-based learning and transfer. The basic framework for a given case was identical across conditions, including characters, setting, research, and ethical problems. The only content that varied by condition was the emotional case content for either the primary or secondary case characters or the socio-relational power case content. Depending upon condition, the cases were one to two pages in length.

## Manipulations

### *Emotional Case Content*

Three levels of emotional case content were developed for the current study. A control group received no emotion-related content for any case characters, but the remaining two-thirds of participants received some emotional case content. One group read cases that contained descriptive emotional content for the primary case character only, and the other group read cases that contained descriptive emotional content for both the primary (i.e., main) and secondary (i.e., supporting) case characters. Emotional case content was defined as descriptions of specific, discrete emotions, such as fear, anger, guilt, or anxiety that case characters experienced as they faced ethical problems. It also included information about the effects of the emotional experiences on the characters. For example, in one of the cases in which the main character realized that individuals in the lab where she works were engaged in data falsification and fabrication, the emotional case content included how the main character felt as a result of this realization. And it also described the influence that the emotional state had on her ethical decisions. One passage in this case reads as follows, “In the weeks following Robin and Jason’s conversation, however, Robin feels less guilt and more anger. She is angry that her research abilities are being questioned because she has chosen to cleanly interpret her data. Robin’s anger begins to influence her attitude about the lab in general, and relationships with other members of the laboratory. More specifically, her anger is starting to cause some confrontational interactions with Jason, as she feels that he is to blame for her embarrassment.”

### *Socio-Relational Power Case Content*

As a way to provide additional context to the emotional reactions, case content involving power dynamics between case characters was added for half of the study participants, including those with no emotional content. This information was an elaboration of the roles and responsibilities assigned to case characters, emphasizing the power distances among them. Constraints and consequences related to that power distance were suggested throughout in the power case content. An example of this in the “Big Pharma” case reads as follows, “Robin tries to think of solutions to the problem, but worries that whatever she tries to do would do more harm than good for her. Dr. Davis is a well-respected researcher in the field, and is quite established. It would be almost impossible to publicly question the integrity of his laboratory’s research given his position and status. Furthermore, with that power and status Dr. Davis could seriously threaten Robin’s chances at finding future employment. Robin has thought about just confronting Jason, but worries that she would ultimately have to deal with Dr. Davis. Jason is more experienced and has already gained respect from Dr. Davis. Dr. Davis would most certainly trust Jason more than Robin, and it would be extremely difficult to make a case to him. Plus, she is confident that Dr. Davis is aware of the sloppy data practices and biased interpretations.” The “Big Pharma” case example, with all manipulations, is included as “[Appendix A](#)” in this manuscript.

## Outcome Measures

### *Knowledge Acquisition*

Two 8-item knowledge measures were developed to assess the extent to which participants processed and remembered basic contextual information from each of the two cases presented. This information included characters' names and research positions, setting (e.g. government vs. university laboratory), character jobs, names of products or programs discussed, central ethical problem, and the case outcome. Examples of knowledge questions included, "What is the position held by Susan in the Side Business case?" and "What is the central problem in the Side Business case?". All items were multiple-choice and the majority had 4 response options. Two items, however, had between 8 and 10 response options and had a "pick all that apply" scoring system associated with them (e.g. "What are the research guidelines relevant to the ethical problem in the Side Business case?"). The highest score on the measures was 8 (one point for each question).

### *EDM Transfer Task*

Transfer of case-based knowledge was assessed via two low-fidelity simulations (Motowidlo et al. 1990) involving common ethical problems. Each of the low-fidelity simulations was comprised of a single ethical case scenario, followed by a series of open-ended questions that addressed the extent to which participants engaged in sensemaking processes that are essential to EDM (Mumford et al. 2008). In one of the situations, participants were asked to take on the role of a graduate student under extreme time and performance pressures as they approached graduation (see "Appendix B"). In the other simulated task, the student takes on the role of a city-council member involved in a faulty bid and contract process (see "Appendix C"). Under each of these simulated tasks, participants were asked to identify the central ethical problem, the causes of the situation, the key challenges and factors or considerations, possible outcomes, and their final decision. These questions elicit engagement in sensemaking processes. Transfer performance was assessed by examining the overall ethicality of the participant's response, and the extent to which they engaged in sensemaking process. Responses to each of the questions were coded using criteria based on (Mumford et al.'s 2008) sensemaking model of ethical decision-making. These variables are described in more detail in the following sections.

### *Decision Ethicality*

Decision ethicality, which refers to the judged appropriateness of a participant's choice, was assessed using a 5-point rating scale in which 3 benchmark criteria were considered, namely: (1) regard for the welfare of others, (2) attention to personal responsibilities, and (3) adherence to/knowledge of social obligations. Inter-judge agreement for this variable was again high ( $ICC = .85$ ).



### *Recognition of Critical Causes*

The extent to which the most central causes for the ethical problem were identified was assessed using a 5-point rating scale (1 = few critical causes identified to 5 = many critical causes identified). Ratings were based on how closely related the causes were to the ethical problem and the extent to which the causes led to the problem. Inter-rater reliability on this variable was high (ICC = .91).

### *Recognition of Critical Constraints*

The extent to which the most central constraints on ethical decision-making were identified in the ethical problem was assessed using a 5-point rating scale (1 = few critical constraints identified to 5 = many critical constraints identified). Ratings were based on how closely related the constraints were to the ethical problem, the extent to which the constraint was an obstacle, and how much the constraint needed to be considered in making a decision. Inter-rater reliability for this variable was strong (ICC = .80).

### *Forecast Quality*

The detail, complexity, and consideration of critical elements in participants' forecasts of potential outcomes were the basis for this variable rating. Using a 5-point rating scale, the quality of the forecasts using these criteria was assessed. Again, inter-rater agreement on this variable was high (ICC = .86).

Three senior level graduate students served as raters for this study. Using a modified frame-of-reference training (Woehr and Huffcutt 1994), raters were extensively prepared to rate the performance variables. More specifically, raters received 20 h of instruction on first, theoretical construct definitions and rater errors, and second, appropriate benchmarks for each of the variable constructs. Raters were given a selection of low-fidelity tasks to calibrate their ratings, which involved group discussion of the ratings, before rating the remaining simulation tasks. Initial reliabilities were also assessed prior to approval to proceed.

### *Analyses*

The influence of case content on case-based learning and transfer was assessed using a combination of analyses of covariance (ANCOVA) and multivariate analysis of covariance MANCOVA tests. ANCOVA provides a statistical test of group mean equality to determine whether observed variance in the dependent variable differs across randomly assigned groups, while controlling for irrelevant or error variance observed in a third variable. MANCOVA is used when multiple dependent variables are examined and the shared variance between these variable should be controlled for. These tests are appropriate for the current study given the examination of categorical independent variables and continuous dependent variables.

The influence of emotional case content and socio-relational power content on case-based knowledge acquisition was examined using separate ANCOVA tests,

with performance on both knowledge measures serving as dependent variables. Next, the effects of the case content and socio-relational case content on EDM transfer were assessed using both MANCOVA and ANCOVA tests across the rated performance variables. No covariates were examined in the analysis.

## Results

Prior to conducting tests for the current hypotheses, an examination of intercorrelations among study variables (see Table 1) was done to better assess whether multivariate, as opposed to univariate, tests should be applied. The high correlations between the EDM transfer task variables suggested that a multivariate approach should be taken with respect to the sensemaking processes.

### Knowledge Acquisition

Two separate ANCOVA analyses were conducted to assess the influence of emotional and socio-relational case content on case-based knowledge acquisition. Separate ANCOVAs were conducted for each of the knowledge measures corresponding to the Big Pharma or Side Business case examples. ANCOVA results for the Big Pharma case demonstrated that whether or not emotional case content is included in an ethical case example has implications for how well case-based knowledge is acquired ( $F(2,123) = 3.48, p = .03, \eta^2 = .06$ ). Comparison tests between emotional case content conditions showed that participants who read Big Pharma with emotional case content for the primary case character ( $M = 6.09, SD = 1.10$ ) performed significantly better on the Big Pharma knowledge test than participants in the control condition ( $M = 5.21, SD = 1.97, p = .005$ ). Participants

**Table 1** Intercorrelations among knowledge acquisition and EDM transfer task variables

Ethics constructs	1	2	3	4	5	6	7	8
<i>Knowledge acquisition</i>								
1 Big pharma knowledge								
2 Side business knowledge	.19*							
<i>Knowledge transfer</i>								
3 Critical causes	.15	.09						
4 Critical constraints	.17	.15	.69**					
5 Forecast quality	.18*	.09	.59**	.77**				
6 Recognizing circumstances	.15	.21*	.74**	.83**	.78**			
7 Anticipate consequences	.24**	.26**	.52**	.67**	.74**	.77**		
8 Consider others'	.05	.22*	.42**	.53**	.42**	.68**	.53**	
9 Decision ethicality	.11	.22*	.67**	.76**	.71**	.94**	.74**	.77**

\* Correlations are significant at  $p < .05$ . \*\* Correlations are significant at  $p < .01$

who read Big Pharma with emotional case content for the primary and secondary case characters ( $M = 5.63$ ,  $SD = 1.30$ ) also performed better on the Big Pharma knowledge test than participants in the control condition, but this difference was not significant. ANCOVA results from the Side Business case were non-significant. Thus, hypothesis 1a is partially supported. However, because participants who read cases with emotional case content for the primary character only out-performed those who read cases with emotional case content for the primary and secondary characters hypothesis 1b is not supported.

Finally, no interactive effects were demonstrated for either of the knowledge measures, which disconfirms hypothesis 3a. It appears that that emotional case content alone is sufficient to promote case-based knowledge acquisition (Table 2).

### EDM Transfer Task

ANCOVA and MANCOVA tests were conducted to determine the potential effect of emotional case content and power dynamic information on an EDM transfer task. First, overall ethical decision-making was assessed using an ANCOVA test. A significant effect for emotional case content was demonstrated on decision ethicality using this approach ( $F(2,116) = 7.56$ ,  $p < .01$ ,  $\eta^2 = .12$ ). Next, sensemaking processes were analyzed using a MANCOVA. Applying the Wilk's Lambda procedure, the MANCOVA found a significant main effect for emotional case content on sensemaking processes ( $F(2,116) = 3.13$ ,  $p = .002$ ,  $\eta^2 = .10$ ). These results support hypotheses 2a.

Given significant MANCOVA results, univariate follow-up tests were conducted to reveal the pattern of effects for each of the sensemaking processes. The ANCOVA test results revealed a similar pattern across each of the variables. A significant main effect for emotional case content was found across the following variables: Recognition of Critical Causes ( $F(2,116) = 5.73$ ,  $p < .01$ ,  $\eta^2 = .09$ ), Recognition of Critical Constraints ( $F(2,116) = 6.33$ ,  $p < .01$ ,  $\eta^2 = .10$ ), and Forecast Quality ( $F(2,116) = 6.33$ ,  $p < .01$ ,  $\eta^2 = .10$ ). The results provide further support for hypothesis 2a (Tables 3, 4).

Comparison tests between manipulated levels of emotional case content revealed that there were no significant differences between levels of emotional case content for any of the sensemaking process variables. However, emotional case content for

**Table 2** Univariate results for emotion case content on knowledge acquisition

	No emotion ( $N = 40$ )		Primary ( $N = 42$ )		Primary and secondary ( $N = 42$ )		Significance		Effect size
	$M$	$SD$	$M$	$SD$	$M$	$SD$	$F$	$p$	$\eta_p^2$
Big pharma knowledge	5.21	1.97	6.08	1.10	5.63	1.30	3.48	.03	.06

$df = 2,123$

**Table 3** MANCOVA results for the effect of emotion case content on EDM transfer task

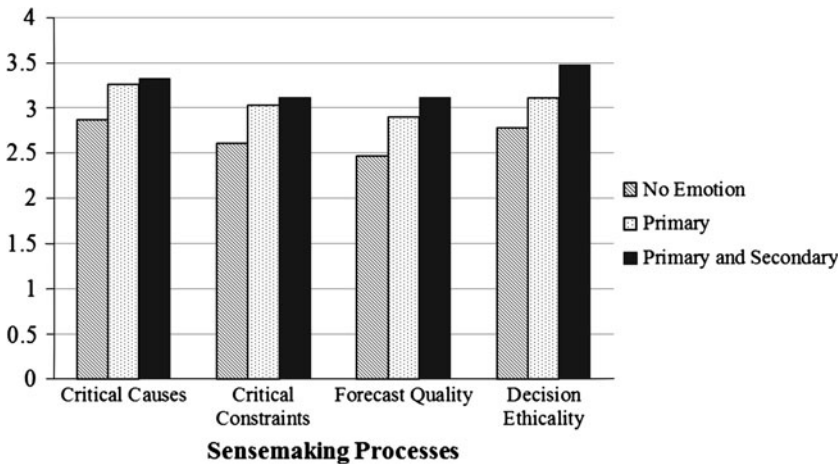
Source	<i>F</i>	<i>p</i>	$\eta^2$
<i>Emotion case content</i>	3.13	.002	.10
Critical causes	5.73	.004	.09
Critical constraints	6.33	.003	.10
Forecast quality	9.08	.000	.14
Decision ethicality	7.56	.001	.12
<i>Power case content</i>	.955	.44	.04
<i>Emotion × power</i>	.54	.83	.02

Rows in italics are multivariate effects, the remaining are univariate effects, which are only reported when the multivariate effect is significant

**Table 4** Comparison tests of level of emotion case content on EDM transfer task

Sensemaking variables	No emotion1 <i>N</i> = 39		Primary2 <i>N</i> = 40		Primary & secondary3 <i>N</i> = 38		Post-hoc tests
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	LSD
1 Critical causes	2.87	.61	3.26	.70	3.33	.66	1v2**, 1v3**
2 Critical constraints	2.61	.64	3.03	.65	3.11	.67	1v2**, 1v3**
3 Forecast quality	2.46	.58	2.90	.74	3.11	.70	1v2**, 1v3**
4 Decision ethicality	2.78	.88	3.11	.72	3.48	.72	1v2*; 1v3**, 2v3*

\* Pairwise comparisons are significant at  $p < .05$ . \*\* Pairwise comparisons are significant at  $p < .01$



**Fig. 1** Mean comparison of emotion case content effects on EDM transfer task variables

both primary and secondary case characters was significantly better than only emotional case content for the primary case character on decision ethicality ( $p = .02$ ), partially confirming hypothesis 2b (Fig. 1).

Once again, no interactive effect for power dynamic case information on emotional case information was found, providing no support for hypothesis 3b. Only emotional case content promoted transfer of case-based knowledge.

## Discussion

Case content, with a focus on emotional content, was examined in this study, along with socio-relational information (power dynamics) in order to determine their effects on case-based knowledge acquisition and its transfer to ethical decision-making. The findings contribute to our understanding of case-based learning in ethics instruction and suggest how the development of cases might be improved. The first finding concerns the effect that emotional case content has on case-based knowledge acquisition. Study results demonstrate that individuals remember ethical cases better when descriptions of the case characters' emotional experiences are highlighted. Affect is a feature that attracts attention and interest, and is actively stored in case-based knowledge structures (Mumford et al. 2001). Thus, emotional case content included in this study may have increased processing, encoding, and retrieval of more details about the cases. An alternative explanation is that the emotional content facilitated more meaningful connections between case features. Perceptions of our own or another's social environment are influenced by such experiences (Frijda 1986; Keltner and Haidt 1999; Parkinson 1996; Van Kleef 2009), and inferences drawn from emotional cues may enhance event cohesion and thus indirectly improve memory storage and retrieval (Christianson 1992; Kensinger et al. 2006; MacKay et al. 2004). Regardless of the mechanism, the current finding extends previous research by demonstrating a positive link between emotion in case examples and case-based knowledge acquisition.

A second finding emerging from this study is that emotional case content has a significant influence on transfer of case-based knowledge to an ethical domain. Participants who read cases with descriptions of emotions experienced by case characters, and the subsequent influences of those emotions, performed better on a low-fidelity ethical transfer task. For some outcome variables, there was an added advantage when emotional case content was provided for both the primary and secondary case characters. Emotion can be both an informative and a contributing factor to the problems and appears to help learners attend to and store important case information. Information that should be provided in effective cases includes decision-making and sensemaking principles (Falkenberg and Woiceshyn 2008). The findings from this study suggest that these principles were attended to and applied to future ethical tasks more effectively when emotional case content was included in case examples. Medin and Ortony (1989) proposed that emotions might facilitate analogical transfer because they improve integration and processing of underlying structural components of cases. In the case of ethical case examples, these could range from components of ethical problems (i.e. causes, constraints, resources, goals, outcomes) to decision-making principles (recognition of key components, processing constraints, awareness of ethical guidelines, forecasting outcomes, etc.). Emotion has also been found to facilitate case prototype formation

in case-based knowledge structures. (Clore and Ortony 2000). This is important because case-based knowledge is organized by prototypes (Dubitzky et al. 1997). More effective prototypes should enhance performance on transfer tasks, as was found in the current study.

Finally, study results revealed that socio-relational case content, in the form of information of power dynamics, did not have a significant effect on case-based knowledge and acquisition. Although other factors could be of importance, in the present study emotional content alone was powerful enough to significantly influence case-based knowledge acquisition and transfer. Future research should, however, examine other types of socio-relational information to determine conclusively whether socio-relational information is entirely irrelevant. This is especially important because our cases contained less of this kind of information compared to emotional content.

### Limitations

Despite the strengths of this study, some limitations should be noted. First, the generalization of these findings to professional settings is somewhat limited given that the research was conducted with novice, albeit graduate level student researchers. On the other hand, this population is often the focus of ethics education, as evidence suggests that college level education and mentoring affects future field norms and values (Johnson and Nelson 1999; Moberg and Velasquez 2004). Further, because this research was conducted in an applied setting, the results should generalize to more traditional professional settings. Nevertheless, future research should examine these findings across different ethics education settings.

A second limitation of the current study concerns whether performance on a low-fidelity task equates to transfer performance. The ethical problems presented in these low-fidelity scenarios were only hypothetical and not based on actual events. Despite these concerns, evidence suggests that low-fidelity simulations accurately predict future performance (Motowidlo et al. 1990)—an effect that has also been demonstrated in an ethics context (Mumford et al. 2006). Future research should examine the influence of emotional case content on high-fidelity scenarios and actual reports of ethical conduct.

Third, while the findings from this study demonstrate the short-term effects that ethics case content has on case-based learning and transfer, long-term effects were not examined. It may be that emotions create a temporary salience that drives case-based knowledge acquisition. However, the results of this study, particularly those for the low-fidelity ethical task, suggest that the effects of emotional case content would influence future performance. However, this was not examined and should be in future research.

Fourth, emotional case content embedded in study cases may be incongruent with the natural emotional reactions of individual participants. Thus, the participants may or may not have found the cases to be more realistic and to evoke natural responses. Moreover, study effects may have been tempered by this incongruence. Despite a potential mismatch, study effects still demonstrate the benefit of richer case content

of ethics education and ethical decision-making. Future research is needed to determine any additional effects of emotionally-congruent case content.

Finally, while the conclusions drawn in this study were based on established theory, no attempt was made to examine the underlying mechanisms through which emotional case content facilitated case-based knowledge acquisition and transfer. As such, many questions remain pertaining to how a particular case content area influences storage and retrieval in case-based knowledge structures. Future research should apply techniques such as think aloud protocols or post hoc interviews to examine what information people attended to or processed when reading emotionally evocative case studies. Further, examinations of the types of case prototypes that are developed by individuals reading emotionally-laden cases, as opposed to those reading cases with little affect, should be carried out.

## Implications

There are a number of important theoretical and practical implications based on the current results. First and foremost, case content can influence case-based learning and application. While the issue of case content as a causal factor in learning and application has been explored theoretically (Falkenberg and Woiceshyn 2008; Kolodner and Guzdzial 2000; Lundberg et al. 2001; Rippen et al. 2002) and empirically, albeit infrequently, in other domains (Connelly et al. 2007), the extent to which certain types of case features or attributes might influence case-based learning and transfer in an ethics domain had not been published. The present findings demonstrate that more critical emphasis should be placed on the content of case examples, with special recognition of those features, like emotion, that might be considered as peripheral to the purpose of cases. The results of the current study also suggest that emotion may serve as an important piece of information in analyzing past cases. Emotion appears to facilitate meaningful connections between case elements (Medin and Ortony 1989) that aid case-based learners in remembering cases more accurately and apply case-based information to future decision-making situations especially in an ethics context. Emotion has been previously recognized as a factor that influences cognition and vice-versa (Forgas 1995; Lazarus 1982), and this research supports those claims by demonstrating the role of affect in case-based reasoning.

In practice, case-developers should take note of the findings of this study. Case development is not an easy task, and there are multiple pieces of information that can be emphasized. Ethical examples too have many points of emphasis, but the findings in the current study demonstrate the need to develop cases rich with emotional content. Developers should, however, seek to further understand how emotion influences EDM, and apply those principles to case-development. For example, case-developers may investigate the effect of certain emotions on EDM (Kligyte et al. 2009) and integrate those emotions and the nature of their effects into realistic case examples for trainees. This should be the focus of future investigations.

Finally, these findings have practical significance for conventional wisdom about case-based learning. Realistic or real-world cases have long been considered to be better than those with unrealistic actions, characters, or outcomes (Easton 1992; Lundberg et al. 2001; Merseth 1996; Richardson 1993). Rarely, however is this

assumption tested or properly explored. Presenting a realistic issue in a case does not imply that the case will seem realistic to the reader. Realism is a function of both the central case issue and how that issue is presented. Often, cases are presented abstractly and dispassionately. The findings in this study suggest that cases are more effective when they are rich with expression, in the form of personal emotion.

## Conclusions

The intent of this study was to increase knowledge about how case content influences case-based learning and transfer in an ethics context. The findings not only highlight the positive influence of emotional case content on these two outcomes, but also point to a need to examine other types of case content for their potential influence on case-based learning and application. It is our hope that these findings will inform the use of case examples in ethics education courses and provide a basis for case development.

## Appendix A: Big Pharma Case

Information that is underlined was manipulated in various case conditions. The type of case content manipulated is identified in italicized labels.

### Big Pharma Case

Jason is in his second year and Robin is just finishing her first year of postdoctoral training in a cell biology lab where they share a good working relationship. They have generous fellowships thanks mostly to their mentor's enterprising associations with the pharmaceutical industry. Dr. Davis, their mentor, does contract work that requires review and approval by industry scientists before work can be submitted for publication.

His university has offered to negotiate with the drug companies for better publication terms. Davis has so far refused on the grounds that he does not want to compromise his competitive edge which has won him a solid reputation along with continued funding for a team of first rate graduate students and post-docs. Davis was always disappointed with other funding sources and the lack of recognition he received from those projects. He decided long ago to compete for private funding because he knew the larger budgets could open the door to limitless research possibilities, and maybe even help him achieve that "break-through" finding he had dreamed of. [*Secondary Case Character Emotion*].

The two post docs are using different animal models to test the efficacy of a gene product. It is hoped that this gene product will interfere with cancer cell-signaling and slow or arrest meta-static activity. Jason's results are extremely encouraging, but Robin's are not. Frustrated, she confides to her friend that she is disappointed with her failing project and a year's loss in productivity. She is also frustrated because Davis has hinted that she must be doing something wrong. After all, Robin



is working with the same protein as Jason, and it is reasonable to expect that her results would at least show a similar trend. This diverging pattern of results really makes Robin uncomfortable and worried, to the point that she feels like she starts to question her ability as a scientist. She wants to talk to others about the situation, but worries that their reactions will be similar to Davis'. Robin even begins to worry that she may not have been well prepared to enter such a challenging postdoctoral position. [*Primary Case Character Emotion*].

In speaking with Jason, he replies candidly about what he learned in his first year—that the industry's emphasis is on getting results. He points out that if the Davis group does not produce, the project will be turned over to another team that will, and the fellowships will follow the money. Jason admits that he was surprised when he came to know of this reality, but expresses the satisfaction he now feels for the opportunities provided from these industry funds. His rationale is that as long as everyone is benefiting, there is no harm in interpreting the results with industry goals in mind. [*Secondary Case Character Emotion*].

What Jason said made sense, but Robin is uncomfortable with the implication she thought was being conveyed. She made a noncommittal remark and changed the subject. However, the new information preyed on her mind. Was she being naively idealistic about science?

In the weeks following Robin and Jason's conversation, however, Robin's feels less guilt and more anger. She is angry that her research abilities are being questioned because she has chosen to cleanly interpret her data. Robin's anger begins to influence her attitude about the lab in general, and relationships with other members of the laboratory. More specifically, her anger is starting to cause some confrontational interactions with Jason, as she feels that he is to blame for her embarrassment. [*Primary Case Character Emotion*].

Robin tries to think of solutions to the problem, but worries that whatever she tries to do would do more harm than good for herself. Dr. Davis is a well-respected researcher in the field, and is quite established. It would be almost impossible to publicly question the integrity of his laboratory's research given his position and status. Furthermore, with that power and status Dr. Davis could seriously threaten Robin's chances at finding future employment. Robin has thought about just confronting Jason, but worries that she would ultimately have to deal with Dr. Davis. Jason is more experienced and has already gained respect from Dr. Davis. Dr. Davis would most certainly trust Jason more than Robin, and it would be extremely difficult to make a case to him. Plus, she is confident that Dr. Davis is aware of the sloppy data practices and biased interpretations. [*Power Dynamics*].

Robin continues to feel uncomfortable with the climate of the lab and her interactions with Jason. While her anger has somewhat subsided, she once again feels fearful about her involvement in what she considers to be highly unethical behavior. Robin's fears cause her to wonder what might happen to her and her career if she stays under Dr. Davis any longer. [*Primary Case Character Emotion*] She contemplates discussing the issue with Davis but fears he will react just like Jason. Ultimately, she decides that the best course of action is to not change her results and to leave the laboratory altogether. When she discusses her resignation with Davis he is surprised and asks for an explanation. She circumvents the real

issue, simply telling him that she doesn't feel like she fits in very well and would like to take her career in a different direction. Robin, admittedly, is conflicted over her decision to withhold information from Davis, but fears that she might create a bigger issue if she shares the entire truth. Davis seems content with her response, and is actually happy that he will no longer need to deal with this semi-controversial student. His satisfaction causes him to ignore the other possible explanations for her departure, and to assume that business can operate as usual. [*Secondary Case Character Emotion*].

Six months later, Robin finds herself in an entry-level position at a small biomedical company. She is satisfied with her current work and is relieved that she no longer faces the pressures of her previous lab. She is even more relieved that she left her post-doc position when she receives word from a former lab mate that Davis's laboratory has lost its funding after being investigated by the Office of Research Integrity on data fabrication charges.

## Appendix B: Tight Schedule Low-Fidelity Task

You are a member of a dedicated team of graduate students working on a project that is funded by the National Institute of Mental Health (NIMH), which is a federal government agency. The project is designed to track the effectiveness of state-run mental health care programs for the poor. The study requires extensive interviews with a large number of people on a yearly basis and the team is running behind schedule.

You and the other students believe that the schedule was unrealistic, and that it would have been almost impossible to stick to the schedule, even in a best-case scenario. There is just too much to do in a short amount of time. The project director, Dr. O'Connell, is highly focused on results and completing the project on time, and he insists on accelerating the pace of interviewing in order to meet the deadline. You are beginning to feel overwhelmed.

On top of this project, you decided to take an extra class this semester. You wanted to take this extra class, because you want to graduate a year early. Your plan is to take an extra class this semester, an extra class next semester, and three classes next summer. You wanted to leave school early because you recently got engaged, and you want to get married and start your new life. Your fiancée recently moved out of town, and you have been spending a lot of your weekend time visiting him/her.

You talked to your advisor about your fast-tracked plan for your coursework, and he discouraged the idea of graduating early. He emphasized that it would be very difficult and time-consuming, but you were convinced that because you wanted it so much, you would be able to do it.

An important progress report to the NIMH is due in 1 month. You and the other staff members still do not know how you are going to complete the rest of the interviews. If this progress report does not work out, it will hurt the opportunity to get more funding in the future. This has put even more pressure on all of the staff and Dr. O'Connell. If you lose funding for this project, all of your hard work will have been for nothing. Dr. O'Connell is putting even more pressure on the graduate students to catch up to the already impossible schedule. You have scheduled your

time this semester so tightly that you have very little flexibility in how and when you fulfill your responsibilities to this and other projects. You are not sure how you are going to get the extra interviews done in time.

### **Appendix C: Friendswood City Council Low Fidelity Task**

You are an expert building contractor. You have a master's degree in civil engineering, and after 20 years of working as a licensed contractor, you decided to retire. You live in Friendswood, a small community with your spouse, and you are very active in the community. You often volunteer your services and expertise to local organizations that need your help. For instance, when city structures are being built, you often volunteer your expertise as a contractor free of charge, so that the city can save money.

You are on the board of the Friendswood city council. There are twelve people that make up the council, including you. Members of the city council are elected by the residents of the city. You feel like the city council elections have become somewhat of a popularity contest, and it seems like the members of the council are the wealthiest members of the community, not necessarily the people would benefit the community most. You feel like some of the members of the city council have no interest in giving back to the community; they just want to feel important by being a part of this organization.

Recently, two of the members of the council have begun to feud. Bill Knight and John Cosby got into an argument over which of them owns a lake that borders both of their property. The council members have begun to take sides, and the council is dividing into two factions. It is getting to the point where city council meetings are not productive. The meetings always turn into a political forum for Bill and John to voice why each is right in the argument.

Furthermore, the in-fighting has caused the members not to communicate well. There are subcommittees in the council for various projects, including community fundraising, maintenance of Main Street, and community social events. The subcommittees have turned into cliques that are not communicating their progress to each other, and communication is essential for productive functioning of the city council. You think the whole argument is silly, and you refuse to take sides. You have considered quitting your position on the council because of this, but you do enjoy giving back to the community, so you decided to stay.

Recently, the city council began looking to fund a renovation project of your local community center. Because you are an expert in construction, you designed the application for constructing companies to bid on this project. Furthermore, because you do not want to work closely with your colleagues on projects, since all of the in-fighting, you decided to design the application by yourself.

You are now a part of the committee reviewing and approving the proposals. The city has expressed a desire for the renovations to begin as soon as possible, and you feel like the committee is rushing the process a little. Nine proposals have passed a first screen by meeting the criteria outlined in the application you designed. You and several others conducted more extensive reviews of the nine proposals. The team of

reviewers has identified the winning proposal, which has many outstanding features. As you scan it one more time, however, you notice that it does not meet one of the ten criteria used in the initial screening process; this proposal should never have even made it past the first round of evaluations. No one else has caught this. Now you wonder what you should do.

## References

- Antes, A. L., Thiel, C. E., Martin, L. E., Mumford, M. D., Devenport, L. D., & Connelly, S. (2011). Reflection on past experience as a source of knowledge to inform ethical decision-making. *Ethics and Behavior* (submitted).
- Blanchette, I., & Dunbar, K. (2001). Analogy use in naturalistic settings: The influence of audience, emotion, and goals. *Memory and Cognition*, *29*, 703–735.
- Bommer, M., Gratto, C., Gravander, J., & Tuttle, M. (1987). A behavioral model of ethical and unethical decision making. *Journal of Business Ethics*, *6*, 265–280.
- Brock, M. E., Vert, A., Kligyte, V., Waples, E. P., Sevier, S. T., & Mumford, M. D. (2008). Mental models: An alternative evaluation of a sensemaking approach to ethics instruction. *Science and Engineering Ethics*, *14*, 449–472.
- Cagle, J. A. B., & Baucus, S. (1996). Case studies of ethics scandals: Effects on ethical perceptions of finance students. *Journal of Business Ethics*, *64*, 213–229.
- Caughron, J. J., Antes, A. L., Stenmark, C. K., Thiel, C. E., Wang, X., Mumford, M. D., Connelly, S., Devenport, L. D., & Brown, R. P. (2011). Sensemaking strategies for ethical decision-making. *Ethics and Behavior*, *5*, 351–366.
- Chen, D. J. (2003). Curricular approaches to research ethics training for psychiatric investigations. *Psychopharmacology*, *171*, 112–119.
- Christian, M. S., Edwards, B. D., & Bradley, J. C. (2010). Situational judgment tests: Constructs and a meta-analysis of their criterion-related validity. *Personnel Psychology*, *63*(1), 83–117.
- Christianson, S. (1992). *Handbook of emotion and memory*. Hillsdale, NJ: Erlbaum.
- Clore, G. L., & Ortony, A. (2000). Cognition in emotion: Always, sometimes, or never? In R. D. Lane & L. Nadel (Eds.), *Cognitive neuroscience of emotion* (pp. 24–61). New York: Oxford University Press.
- Connelly, S., Allen, M. T., & Waples, E. (2007). The impact of content and structure on a case-based approach to developing leadership skills. *International Journal of Learning and Change*, *2*, 218–249.
- Dahl, D. W., & Moreau, P. (2002). The influence and value of analogical thinking during new product ideation. *Journal of Marketing Research*, *39*, 47–60.
- Dubitzky, W., Schuster, A., Hughes, J., & Bell, D. (1997). Advanced case knowledge architecture based on fuzzy objects. *Applied Intelligence*, *7*, 187–204.
- Easton, G. (1992). *Learning from case studies* (2nd ed.). New York, NY: Prentice-Hall.
- Falkenberg, L., & Woiceshyn, J. (2008). Enhancing business ethics: Using cases to teach moral reasoning. *Journal of Business Ethics*, *79*, 213–217.
- Feret, M. P., & Glasgow, J. I. (1997). Combining case-based and model-based reasoning for the diagnosis of complex devices. *Applied Intelligence*, *7*, 57–78.
- Forgas, J. P. (1995). Mood and judgment: The affect infusion model (AIM). *Psychological Bulletin*, *117*, 39–66.
- Frijda, N. H. (1986). *Emotions*. New York City, NY: Cambridge University Press.
- Gaudine, A., & Thorne, L. (2001). Emotion and ethical decision-making in organizations. *Journal of Business Ethics*, *31*, 175–187.
- Gentner, D., & Medina, J. (1998). Similarity and the development of rules. *Cognition*, *65*, 263–297.
- Gentner, D., Loewenstein, J., & Thompson, L. (2003). Learning and transfer: A general role for analogical encoding. *Journal of Educational Psychology*, *95*, 393–408.
- Goldstein, T. L., & Ford, J. K. (2002). *Training in organizations*. Belmont, CA: Wadsworth.

- Hammond, K. J. (1990). Case-based planning: A framework for planning from experience. *Cognitive Science, 14*, 385–443.
- Johnson, W. B., & Nelson, N. (1999). Mentor-protégé relationships in graduate training: Some ethical concerns. *Ethics and Behavior, 9*, 189.
- Keefer, M., & Ashley, K. D. (2001). Case-based approaches to professional ethics: A systematic comparison of students' and ethicists' moral reasoning. *Journal of Moral Education, 30*, 377–398.
- Keltner, D., & Haidt, J. (1999). Social functions of emotions at four levels of analysis. *Cognition and Emotion, 13*, 505–521.
- Kensinger, E. A., Uttl, B., Ohta, N., & Siegenthaler, A. L. (2006). Memory and emotion. *Experimental Psychology, 54*, 243–244.
- Kligyte, V., Connelly, S., Thiel, C. E., Devenport, L. D., Brown, R. P., & Mumford, M. D. (2009, April). *Influence of emotions and emotion regulation strategies on ethical decision-making. Paper presented at the annual meeting of the society for industrial and organizational psychology*. New Orleans, LA.
- Kolodner, J. L. (1992). An introduction to case-based reasoning. *Artificial Intelligence Review, 6*, 3–34.
- Kolodner, J. L. (1993). *Case-based reasoning*. San Mateo, CA: Morgan Kaufman.
- Kolodner, J. L. (1997). Educational implications of analogy: A view from case-based reasoning. *American Psychologist, 52*, 57–66.
- Kolodner, J. L., Camp, P. J., Crismond, D., Fasse, B., Gray, J., Holbrook, J., et al. (2003). Problem-based learning meets case-based reasoning in the middle-school classroom: Putting learning by design into practice. *The Journal of Learning Sciences, 12*, 495–547.
- Kolodner, J. L., & Guzdial, M. (2000). Theory and practices of case-based learning aids. In D. H. Jonassen & S. M. Land (Eds.), *Theoretical foundations of learning environments* (pp. 215–242). Mahwah, NJ: Lawrence Erlbaum.
- Kolodner, J. L., & Simpson, R. L. (1989). The MEDIATOR: Analysis of an early case-based problem solver. *Cognitive Science, 13*, 507–549.
- Lazarus, R. S. (1982). Thoughts on the relations between emotion and cognition. *American Psychologist, 37*, 1019–1024.
- Lundberg, C. C., Rainsford, P., Shay, J. P., & Young, C. A. (2001). Case writing reconsidered. *Journal of Management Education, 25*, 450–463.
- Lynn, L. (1999). *Teaching and learning with cases: A guidebook*. New York, NY: Chatham House.
- Mackay, D. G., Shafto, M., Taylor, J. K., Marian, D. E., Abrams, L., & Dyer, J. (2004). Relations between emotion, memory, and attention: Evidence from taboo stroop, lexical decision, and immediate memory tasks. *Memory and Cognition, 32*, 474–488.
- Martin, L. E., Stenmark, C. K., Thiel, C. E., Antes, A. L., Mumford, M. D., Connelly, S., et al. (2011). The influence of temporal orientation and affective frame on use of ethical decision-making strategies. *Ethics and Behavior, 21*, 127–146.
- McWilliams, V., & Nahavandi, A. (2006). Using live cases to teach ethics. *Journal of Business Ethics, 67*, 421–433.
- Medin, D. L., & Ortony, A. (1989). Psychological essentialism. In S. Vosniadou & A. Ortony (Eds.), *Similarity and analogical reasoning* (pp. 179–195). Cambridge: Cambridge University Press.
- Merseth, K. K. (1996). Case and case methods in teacher education. In J. Sikula, T. J. Buttery, & E. Guyton (Eds.), *Handbook of research on teacher education* (2nd ed., pp. 722–744). New York, NY: Macmillan.
- Moberg, D. J., & Velasquez, M. (2004). The ethics of mentoring. *Business Ethics Quarterly, 14*, 95–122.
- Motowidlo, S. J., Dunnette, M. D., & Carter, G. W. (1990). An alternative selection procedure: The low-fidelity simulation. *Journal of Applied Psychology, 75*, 640–647.
- Mumford, M. D., Connelly, S., Brown, R. P., Murphy, S. T., Hill, J. H., Antes, A. L., et al. (2008). Sensemaking approach to ethics training for scientists: Preliminary evidence of training effectiveness. *Ethics and Behavior, 18*, 315–339.
- Mumford, M. D., Devenport, L. D., Brown, R. P., Connelly, S., Murphy, S. T., Hill, J. H., et al. (2006). Validation of ethical decision-making measures: Evidence for a new set of measures. *Ethics and Behavior, 16*, 319–345.
- Mumford, M. D., Schultz, R. A., & Osborn, H. K. (2002). Planning in organizations: Performance as a multi-level phenomenon. In F. J. Yammarino & F. Dansereau (Eds.), *Research in multi-level issues: The many faces of multi-level issues* (pp. 3–63). Oxford: Elsevier.
- Mumford, M. D., Schultz, R. A., & Van Doorn, J. R. (2001). Performance in planning: Processes, requirements, and errors. *Review of General Psychology, 5*, 225–251.

- Parkinson, B. (1996). Emotions are social. *British Journal of Psychology*, *87*, 663–683.
- Patalano, A. L., & Siefert, C. M. (1997). Opportunistic planning: Being reminded of pending goals. *Cognitive Psychology*, *34*, 1–36.
- Richardson, B. (1993). Why we need to teach crisis management and to use case studies to do it. *Management Education and Development*, *24*, 138–148.
- Rippen, A., Booth, C., Bowie, S., & Jordan, J. (2002). A complex case: Using the case study method to explore uncertainty and ambiguity in undergraduate business education. *Teaching in Higher Education*, *7*, 429–441.
- Sonenshein, S. (2007). The role of construction, intuition, and justification in responding to ethical issues at work: The sensemaking-intuition model. *Academy of Management Review*, *4*, 1022–1040.
- Steinel, W., Van Kleef, G. A., & Harinck, F. (2008). Are you talking to me?! Separating the people from the problem when expressing emotions in negotiation. *Journal of Experimental Social Psychology*, *44*, 362–369.
- Stenmark, C., Antes, A. L., Wang, X., Caughron, J., Thiel, C. E., & Mumford, M. D. (2010). Strategies in forecasting outcomes in ethical decision-making: Identifying and analyzing the causes of the problem. *Ethics and Behavior*, *20*, 110–127.
- Taylor, R. S., & Chi, M. T. H. (2006). Simulation versus text: Acquisition of explicit and implicit information. *Journal of Educational Computing Research*, *35*, 289–313.
- Taylor, R. S., Russ-Eft, D. F., & Chan, D. W. L. (2005). A meta-analytic review of behavior modeling training. *Journal of Applied Psychology*, *90*, 692–709.
- Thiel, C. E., Connelly, S., & Griffith, J. A. (2011). The influence of ethical decision-making: Comparison of a primary and secondary appraisal. *Ethics and Behavior*, *21*(5), 380–408.
- Trevino, L. K. (1986). Ethical decision making in organizations: A person-situation interactionist model. *The Academy of Management Review*, *11*, 601–617.
- Urbanac, F. R. (1998). A business education resource for ethics sites on the web. *Journal of Education for Business*, *73*, 314–317.
- Van Kleef, G. (2009). How emotions regulate social life: The emotions as social information (EASI) model. *Current Directions in Psychological Science*, *18*, 184–188.
- Van Kleef, G. A., & Cote, S. (2007). Expressing anger in conflict: When it helps and when it hurts. *Journal of Applied Psychology*, *92*, 1557–1569.
- Ward, T. B., Patterson, M. J., Sifonis, C. M., Dodds, R. A., & Saunders, K. N. (2002). The role of graded category structure in imaginative thought. *Memory and Cognition*, *30*, 199–216.
- Werhane, P. H. (2002). Moral imagination and systems thinking. *Journal of Business Ethics*, *38*, 33–42.
- Williams, S. M. (1992). Putting case-based instruction into context: Examples from legal and medical education. *The Journal of Learning Sciences*, *2*, 367–427.
- Woehr, D. J., & Huffcutt, A. I. (1994). Rater training for performance appraisal: A quantitative review. *Journal of Occupational and Organizational Psychology*, *67*, 189–205.