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# Assessing Veterinary and Animal Science Students' Moral Judgment Development on Animal Ethics Issues

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## ABSTRACT

Little has been done to assess veterinarians' moral judgment in relation to animal ethics issues. Following development of the VetDIT, a new moral judgment measure for animal ethics issues, this study aimed to refine and further validate the VetDIT, and to identify effects of teaching interventions on moral judgment and changes in moral judgment over time. VetDIT-V1 was refined into VetDIT-V2, and V3 was developed as a post-intervention test to prevent repetition. To test these versions for comparability, veterinary and animal science students ( $n = 271$ ) were randomly assigned to complete different versions. The VetDIT discriminates between stages of moral judgment, condensed into three schemas: Personal Interest (PI), Maintaining Norms (MN), and Universal Principles (UP). There were no differences in the scores for MN and UP between the versions, and we equated PI scores to account for differences between versions. Veterinary science students ( $n = 130$ ) who completed a three-hour small-group workshop on moral development theory and ethical decision making increased their use of UP in moral reasoning, whereas students ( $n = 271$ ) who received similar information in a 50-minute lecture did not. A longitudinal comparison of matched first- and third-year students ( $n = 39$ ) revealed no moral judgment development toward greater use of UP. The VetDIT is therefore useful for assessing moral judgment of animal and human ethics issues in veterinary and other animal-related professions. Intensive small-group workshops using moral development knowledge and skills, rather than lectures, are conducive to developing veterinary students' moral judgment.

**Key words:** ethics education, ethics workshop, moral judgment, veterinary ethics, animal ethics

## INTRODUCTION

Moral judgment may not be sufficient for moral behavior, but it is a necessary component.<sup>1(p.512)</sup> Although ethics teaching has been a part of veterinary curricula in the US for the past 30 years,<sup>2</sup> little has been done to assess moral judgment development, particularly in relation to animal ethics issues that are central to veterinary work. In 2012, the VetDIT was developed to address this need.<sup>3</sup> It was based on the Defining Issues Test (DIT),<sup>4</sup> which has been used extensively to assess moral judgment in a range of educational and professional contexts.<sup>5</sup> The DIT condenses Kohlberg's six hierarchical stages of moral judgment into three hierarchical schemas:

- Schema 1: Personal Interest (PI)—recognizing authority and reciprocal relationships that result in reward or punishment for the person.
- Schema 2: Maintaining Norms (MN)—abiding by existing rules and regulations set by governments or professional groups.
- Schema 3: Post-conventional, referred to here as Universal Principles (UP)—emphasizing moral ideals that are constructive and not self-serving.

Development occurs through the adoption of higher level schemas.<sup>6</sup>

Our initial VetDIT included three animal ethics scenarios (euthanasia of a healthy dog, reporting of sub-standard pig husbandry, and breeding modification of hens) and, for comparison, three human ethics scenarios from Rest et al.'s DIT (stealing during a famine, reporting previous criminal history of a government candidate, and canceling a school meeting due to violence in previous meetings). Each scenario had 12 questions, which students initially rated for importance when making a decision about how to act on the issue. Students then identified the most important four questions, which were ranked 1–4 and which we then scored and allocated to the relevant schema (PI, MN, or UP). Each schema's total scores for the three animal and three human scenarios were converted to percentages.<sup>6</sup>

Our first study to develop and test the VetDIT suggested that first-year veterinary students had similar moral reasoning on human ethics issues to US freshman across a range of disciplines, however they had higher UP, similar MN, and lower PI reasoning on animal ethics issues than on human ethics issues.<sup>3</sup> This study aimed to:

- refine and further validate the VetDIT;
- identify the effects of two different teaching interventions on veterinary and animal science students' moral judgment; and
- identify changes in moral judgment of veterinary students between first and third year.

A systematic review of 172 DIT studies<sup>5</sup> has demonstrated that moral development may occur as a result of higher education, beyond the development attributable to age, with students decreasing conventional judgment (relying on maintaining norms) and increasing post-conventional judgment<sup>5</sup> (relying on ethical principles and frameworks).<sup>6</sup> However, development may be affected by college context and program.<sup>7</sup> Two studies of veterinary students showed no development in moral reasoning, using DIT scores<sup>8</sup> and Kohlberg's Moral Judgment Interview (KMJI)<sup>9</sup> as pre- and post-measures administered to students in a four-year program, although another using Gibb's Sociomoral Reflection Measure demonstrated improvement.<sup>10</sup> Medical students also showed no development after four years,<sup>11</sup> or a decrease after year three,<sup>12</sup> assessed by KMJI.

Moral judgment can also be enhanced by ethics programs and interventions, including dilemma discussion, psychological education, and direct teaching of component skills (e.g., skills of logic, role taking, and justice operations).<sup>13</sup> Penn argued that "just as students are not likely to develop skills in higher level mathematical and scientific judgment without direct teaching and modeling, it is unlikely that students will develop skills in higher level moral judgment without direct teaching and modelling."<sup>14(p.126)</sup> Using a comparison of 55 different intervention programs at various institutions,<sup>15</sup> Penn confirmed the superiority of an intervention based on "moral development theory, stage typology, and philosophical methods of ethical analysis and their application to social issues."<sup>14(p.136)</sup>

Small-group discussion is believed to be particularly effective in moral judgment development. A review of medical ethics teaching showed that small-group discussion has a greater impact on moral judgment development than lectures.<sup>16</sup> A 15-hour ethics course for first-year veterinary students, including four two-hour small-group case study discussions with practicing veterinarians, produced an increase in female but decrease in male DIT UP scores post-test.<sup>17</sup> However, a profession-specific DIT has never been used to measure course impact on veterinarians' moral judgment of animal ethics issues.

Based on previous studies applying the generic DIT in other professions, it was hypothesized that the VetDIT would identify improvement in veterinary students' moral judgment on animal ethics issues following an intensive three-hour small-group workshop, but not following a lecture. It was also hypothesized that there would be no improvement in moral judgment over the course of the veterinary program.

## MATERIALS AND METHODS

Approval for this study was obtained from the University of Queensland Ethical Review Committee.

## Refining the VetDIT

A 2013 review of the VetDIT (VetDIT-V1) by a group with expertise in philosophy, psychometrics, professional ethics, and animal welfare science resulted in a revised version, VetDIT-V2. Each scenario and its 12 associated questions were simplified and clarified. PI, MN, and UP items were balanced to include 11 of each across the three animal scenarios, with one irrelevant item in each scenario for reliability checks. A third version (VetDIT-V3) was created as a post-teaching test to identify any moral judgment improvement, and to avoid the risk of students attempting to remember responses from the initial test or becoming disillusioned with a repeated test. The three new scenarios (euthanasia of a healthy cat, removal of sheep from a research study, and breeding modification of pigs) had similar issues and structure to the VetDIT-V2 scenarios. All these animal scenarios were based on moral dilemma cases commonly experienced by veterinarians.<sup>18</sup>

To test for comparability of the three VetDIT versions for use as pre- and post-tests, two cohorts of students at the University of Queensland were used: third-year veterinarians to compare VetDIT-V1 and -V2 and first-year Bachelor of Applied Science (Production Animal) students (both internal and external students) to compare VetDIT-V2 and -V3. These groups were chosen due to their subject relevance and their availability to undertake tests during lectures on animal welfare and ethics. Cohorts were split in half alphabetically by surname to complete the different versions of the VetDIT (for numbers and cohort proportions of students, see Table 1). PI, MN, and UP scores for animal scenarios were processed by JV and compared with the human scenario scores, processed by the Centre for the Study of Ethical Development, University of Alabama (CSEDUA), which has the necessary formulae and historical responses for testing international comparability.<sup>19</sup> A standardized reliability check on the human scenario responses by the CSEDUA<sup>20</sup> was used to eliminate responses that showed inconsistencies between items rated and ranked, missing data, selection of meaningless items, and indiscriminate answers. A similar process was used for students who completed the animal scenarios.

## Teaching Interventions

All first-year veterinary science students (Table 1), arranged into groups of 25, were required to attend a three-hour workshop (Table 2) on moral development theory and ethical decision making using a template (Table 3) developed by JV based on Preston's Ethic of Response Decision-Making Model.<sup>21</sup> The third-year veterinary science students and first-year animal science students who were involved in the validation of the VetDIT versions were provided with similar content in one 50-minute lecture, without the interactive teaching strategies, guided practice, and small-group interaction. After adjusting PI scores for comparability of the different versions of the DIT completed by different cohorts before and after the teaching interventions, validated and matched students ( $n = 401$ ) from the three cohorts were compared for growth in moral judgment, as determined by the VetDIT-V2.

**Table 1:** Student cohorts, VetDIT versions, and numbers of students (% of cohort)

Cohort	Pre-test VetDIT Version	Post-test VetDIT Version	Matched validated students pre- and post-test (% of cohort)
First-year BVSc 2013 (149)	V2	V3	130 (88%)
First-year BAppSc (Production Animals), internal students 2014 (291)	V2	V3	85 (29%)
	V3	V2	79 (27%)
Total			164 (56%)
First-year BAppSci (Production Animals), external students 2014 (54)	V2	V3	11 (20%)
	V3	V2	16 (30%)
Total			27 (50%)
Third-year BVSc 2014 (115)	V1 53 (46%)	V3 100 (87%)	80 (70%)
	V2 59 (51%)		

### Changes in Moral Judgment during the Program

To identify changes in moral judgment during the veterinary program, a longitudinal analysis of PI, MN, and UP scores for both human and animal ethics issues was conducted using matched 2012 first- and 2014 third-year veterinary students ( $n = 39$ ). These students completed the VetDIT-V1 in their first year before an animal ethics lecture and large group exploration of ethical decision-making strategies, and in their third year before any further ethics teaching.

### Demographics

Basic demographic information was gathered, that is, students' gender, age, previous university degrees, which degrees had been completed, and whether English was their primary language. Experience (from 1 = *very great extent* to 5 = *never*) with companion animals, with farm animals, and with horses were determined to identify their effects on moral judgment in relation to animal ethics issues.

### Statistical Analysis

A general linear model was used to compare versions and to test the significance of demographic variables on the PI, MN, and UP scores for the three animal scenarios in three VetDIT versions. Comparisons were made between V1 and V2, and between V2 and V3. Residuals were tested for normal distribution using the Anderson-Darling test. MN and UP scores were normally distributed for both comparisons. However, PI scores were not normally distributed, so  $\sqrt{\text{PI}}$  was used for the V1 and V2 comparison. A Moods median test was used to compare V2 and V3, because normally distributed residuals could not be achieved after a variety of transformations. There was no significant difference between MN and UP scores from different versions, so no conversion of V1 and V3 data for these two schemas was needed. To standardize to V2 and allow comparison of PI scores between versions, V1 and V3 scores were multiplied by the constants, mean score V2/mean score V1, and mean score V2/mean score V3, respectively.

A general linear model was used to test for the impact of the program, the teaching intervention (pre- and post-test), the interaction between these two factors, and demographic variables on PI, MN, and UP scores for the three animal scenarios. PI and MN residuals approximated a normal distribution, and data for UP was squared to produce a normal distribution of the residuals. The same model was used to test for longitudinal changes between the first and third years of the veterinary program. Residuals for human ethics and animal ethics MN scores were normally distributed. Residuals for PI and UP animal ethics scores were not normally distributed and Moods median tests were used.

### RESULTS

Demographic information gathered for the three cohorts of students indicated mostly female students, no previous degree, English as the primary language, and greater experience with companion animals than farm animals or horses (Table 4).

### Comparability of DIT Versions

There were no significant differences ( $p < .05$ ) between versions in MN and UP scores, but PI scores were greater in V1 (Table 5) and V3 (Table 6) than in V2.

### Effect of Ethics Teaching and Changes during the Program

The first-year veterinary students who completed the workshop decreased both PI and MN scores and increased UP scores (Table 7).

Students assessed the workshop elements positively. Of the whole cohort of 149 students, the majority agreed (Table 8) that Preston's Ethic of Response Decision-Making Model helped to

- clarify and modify their position;
- clarify others' positions and ethical judgment;
- become aware of the complexity of making ethical decisions;
- use ethical frameworks and principles; and
- improve moral judgment skills.

**Table 2:** Moral judgment and ethical decision-making workshop (3 hours)

Activity	Purpose	Resource	Duration
Animal ethics issues questionnaire	Reflecting on ethical sensitivity, motivation, action	Animal ethics issues questionnaire	10 min
Human continuum	Taking a position on an ethical issue, considering others' positions, identifying the wide range of views and comparing with own view, possibly modifying own position, and raising question of how to decide which positions are ethical	Suitable room for students to stand in a semi-circle from <i>Strongly Agree</i> to <i>Strongly Disagree</i> on an animal ethics issue (students take a position, discuss with others with similar positions, listen to the range of positions, and possibly shift positions)	10 min
Explanation of Kohlberg's Theory of Moral Development and the value of Principled Reasoning	Understanding how we develop morally and how we can identify an ethical position	PowerPoint presentation	10 min
Modeling use of Preston's Ethic of Response Template	Observing how to apply a comprehensive ethical decision-making model to an animal ethics issue	PowerPoint presentation of the template's step-by-step completion	10 min
Hot Potato activity in groups of three (quick recording and passing of worksheets to add new ideas)	Focusing on the issue and identifying a wide range of ideas	Worksheet for brainstorming facts, stakeholders, possible actions	5 min
Completing Preston's Ethic of Response on a new issue (same for each group)	Using the main ethical frameworks (utilitarian, deontological, and virtue ethics) and universal principles of respect for life and well-being, justice as fairness, and integrity to come to a fitting ethical decision	Blank template for each group; completed model template and justification paragraph for each student	20 min
Group reports on their decision and justification	Justifying ethical decisions using universal ethical frameworks and principles		10 min
Ethical decision-making survey	Evaluating ethical decision-making strategies used in workshop	Survey sheet for each student	10 min
Defining Issues Test (post-test)	Reflecting on one's own moral schema (what is important when making a decision on an ethical issue?)	DIT for each student	20 min
Individual assessment	Application and justification for ethical decisions	Assessment sheet with new scenario to record justification; blank template for each student	30 min

Most students agreed that developing ethical decision-making skills in the first-year veterinary course and practicing ethical decision-making skills in small-group sessions were helpful, and that more sessions addressing animal ethics issues in various aspects of veterinary work as the program progresses would be worthwhile (Table 9).

There was no effect of the single lecture on VetDIT scores for either first-year animal science or third-year veterinary science students (Table 7). There was no longitudinal change between matched first- and third-year veterinary students' PI, MN, or UP scores on animal or human scenarios ( $p > .200$ ).

### Demographic Influences

Of the third-year veterinary and first-year production animal science students, males had higher PI scores than females (Tables 5 and 6, respectively). Of the production animal science students, males had lower mean UP scores than females (Table 6). Across the three cohorts of students (first- and third-year veterinary and first-year production animal science students), males had higher PI scores than females (8.6 compared with 4.6 for females;  $p < .001$ ) and a lower mean UP score (male = 59.8; female = 67.2;  $p < .001$ ). Across these three cohorts, PI scores decreased with age ( $p = .035$ ) (Figure 1). Students

**Table 3: Ethic of Response Template (ERT), sample scenario: breeding modification for blind hens**

Stakeholders	Action: keep beak trimming		Action: breed blind hens		Action: move to less intensive production (low density free range and educating consumers to pay more)	
	Respect life	Respect well-being	Respect life	Respect well-being	Respect life	Respect well-being
1 Hens	<ul style="list-style-type: none"> <li>✗ Large numbers have short lives</li> </ul>	<ul style="list-style-type: none"> <li>✗ Painful trimming</li> <li>✗ Hens still frustrated</li> </ul>	<ul style="list-style-type: none"> <li>✗ Large numbers have short lives</li> </ul>	<ul style="list-style-type: none"> <li>✗ Lose one of their major senses/capacity for quality of life</li> <li>✓ Less feather pecking</li> </ul>	<ul style="list-style-type: none"> <li>✓ Fewer having short lives</li> </ul>	<ul style="list-style-type: none"> <li>✓ Increased quality of life</li> </ul>
2 Farmers/producers	<ul style="list-style-type: none"> <li>✓ Maintains production levels</li> <li>✗ Increasing pressure from consumers, general public, welfare groups</li> </ul>	<ul style="list-style-type: none"> <li>✓ Easier to manage hens</li> <li>✗ Possibly greater repercussions from general public and concerns with industry future</li> </ul>	<ul style="list-style-type: none"> <li>✓ Lower production</li> <li>✓ Increasing demand for free range</li> </ul>	<ul style="list-style-type: none"> <li>✗ Lower production</li> <li>✓ Increasing demand for free range</li> </ul>	<ul style="list-style-type: none"> <li>✗ Lower production</li> <li>✓ Increasing demand for free range</li> </ul>	<ul style="list-style-type: none"> <li>✗ Lower production</li> <li>✓ Increasing demand for free range</li> </ul>
3 Consumers	<ul style="list-style-type: none"> <li>✓ Continued cheap eggs</li> <li>✗ Some don't like it and moving to keep own chickens</li> </ul>	<ul style="list-style-type: none"> <li>✓ Increased supply of cheap eggs</li> <li>✗ More consumer backlash due to hens' permanent loss of sight capacity</li> </ul>	<ul style="list-style-type: none"> <li>✗ More expensive eggs</li> <li>✓ Greater satisfaction with product and own integrity</li> </ul>	<ul style="list-style-type: none"> <li>✗ More expensive eggs</li> <li>✓ Greater satisfaction with product and own integrity</li> </ul>	<ul style="list-style-type: none"> <li>✗ More expensive eggs</li> <li>✓ Greater satisfaction with product and own integrity</li> </ul>	<ul style="list-style-type: none"> <li>✗ More expensive eggs</li> <li>✓ Greater satisfaction with product and own integrity</li> </ul>
4 Egg industry	<ul style="list-style-type: none"> <li>✓ Maintain production levels</li> <li>✗ Consumer/public concerns</li> </ul>	<ul style="list-style-type: none"> <li>✓ Increased egg production levels</li> <li>✗ Possible decreased demand due to public concerns</li> <li>✗ Expense of research and time for trials</li> </ul>	<ul style="list-style-type: none"> <li>✗ Decreased egg production levels</li> <li>✓ Higher value product</li> <li>✓ Increased community satisfaction with egg industry</li> </ul>	<ul style="list-style-type: none"> <li>✗ Decreased egg production levels</li> <li>✓ Higher value product</li> <li>✓ Increased community satisfaction with egg industry</li> </ul>	<ul style="list-style-type: none"> <li>✗ Decreased egg production levels</li> <li>✓ Higher value product</li> <li>✓ Increased community satisfaction with egg industry</li> </ul>	<ul style="list-style-type: none"> <li>✗ Decreased egg production levels</li> <li>✓ Higher value product</li> <li>✓ Increased community satisfaction with egg industry</li> </ul>
5 Researchers	<ul style="list-style-type: none"> <li>✗ Less work</li> </ul>	<ul style="list-style-type: none"> <li>✓ More work in this area</li> <li>✗ Loss of integrity</li> </ul>	<ul style="list-style-type: none"> <li>✗ Less work with genetic manipulation</li> <li>✓ More time for less destructive research (e.g. better systems for hens' interests)</li> </ul>	<ul style="list-style-type: none"> <li>✗ Less work with genetic manipulation</li> <li>✓ More time for less destructive research (e.g. better systems for hens' interests)</li> </ul>	<ul style="list-style-type: none"> <li>✗ Less work with genetic manipulation</li> <li>✓ More time for less destructive research (e.g. better systems for hens' interests)</li> </ul>	<ul style="list-style-type: none"> <li>✗ Less work with genetic manipulation</li> <li>✓ More time for less destructive research (e.g. better systems for hens' interests)</li> </ul>
6 General public	<ul style="list-style-type: none"> <li>✗ Generally concerned about animal welfare</li> </ul>	<ul style="list-style-type: none"> <li>✗ Increasing concern about manipulation of animals' capacities</li> </ul>	<ul style="list-style-type: none"> <li>✓ Less concern about animal welfare issues</li> </ul>	<ul style="list-style-type: none"> <li>✓ Less concern about animal welfare issues</li> </ul>	<ul style="list-style-type: none"> <li>✓ Less concern about animal welfare issues</li> </ul>	<ul style="list-style-type: none"> <li>✓ Less concern about animal welfare issues</li> </ul>

**Table 3:** (continued)

Stakeholders	Action: keep beak trimming		Action: breed blind hens		Action: move to less intensive production (low density free range and educating consumers to pay more)	
	Respect life	Respect well-being	Respect life	Respect well-being	Respect life	Respect well-being
7 Animal welfare groups	<ul style="list-style-type: none"> <li>✗ More work to do to prevent beak trimming</li> <li>✗ Upset due to animal welfare concerns</li> </ul>	<ul style="list-style-type: none"> <li>✓ Plentiful eggs to sell</li> <li>✗ Some consumers unhappy</li> </ul>	<ul style="list-style-type: none"> <li>✗ Extremely concerned about manipulation of animals' capacities</li> <li>✗ Increased work to prevent this</li> </ul>	<ul style="list-style-type: none"> <li>✓ Less concern about hens' well-being</li> </ul>		
8 Retailers	<ul style="list-style-type: none"> <li>✓ Plentiful eggs to sell</li> <li>✗ Some consumers unhappy</li> </ul>	<ul style="list-style-type: none"> <li>✗ Concerned about pain to chickens and ongoing feeding issues if done badly</li> </ul>	<ul style="list-style-type: none"> <li>✓ Plentiful eggs to sell</li> <li>✗ Probably more consumers unhappy due to more serious impact on hens</li> </ul>	<ul style="list-style-type: none"> <li>✗ Fewer cheap eggs to sell</li> <li>✓ Increased satisfaction regarding product quality</li> </ul>		
9 Vet	<ul style="list-style-type: none"> <li>✗ Concerned about pain to chickens and ongoing feeding issues if done badly</li> </ul>	<ul style="list-style-type: none"> <li>✗ Concerned about loss of professional integrity to prevent harm to animals</li> </ul>	<ul style="list-style-type: none"> <li>✗ Concerned about permanent loss to hens' capacities; unknown further impacts on the species</li> <li>✗ Loss of personal and professional integrity (to heal and not harm animals)</li> </ul>	<ul style="list-style-type: none"> <li>✓ Less worry about hens' well-being</li> <li>✓ Increased integrity</li> </ul>		
<b>Utilitarian ethics</b> (rating 1-5; 1 = greatest benefits)	5	5	4	4	2	2
<b>Justice as fairness</b> (rating 1-5; 1 = fairest for least advantaged)	5	5	5	5	3	3
<b>Virtue ethics/integrity</b> (rating 1-5; 1 = most virtuous, consistent)	4	4	5	5	3	3

✓ = Benefits; ✗ = Harms

Template based on Preston's Ethic of Response Decision-Making Model<sup>21</sup>

Students choose the most fitting action based on the three ratings and justify their choice using ethics language and reasoning from the template

**Table 4:** Demographics for first-year BVSc, first-year BAppSc (Production Animal Science), and third-year BVSc students

Demographics		First-year BVSc (130)	First-year BAppSc (Production Animal Science) Internal (164)	First-year BAppSc (Production Animal Science) External (27)	Third-year BVSc (80)
Age	Range	17–42	16–45	16–50	18–51
	median	20	18	20	21
	< 21	76 (58%)	129 (79%)	15 (56%)	25 (32%)
	21–25	45 (35%)	24 (15%)	6 (22%)	40 (51%)
	> 25	9 (7%)	11 (7%)	6 (22%)	14 (18%)
Female		108 (84%)	143 (87%)	25 (93%)	62 (77%)
Previous degree		35 (27%)	10 (6%)	3 (11%)	15 (19%)
English as primary language		112 (86%)	153 (93%)	26 (96%)	66 (82%)
Very great or great experience/ minimal or no experience with:	Companion animals	92 (71%)/ 13 (10%)	137 (84%)/ 13 (8%)	26 (96%)/ 0 (0%)	66 (82%)/ 2 (2%)
	Farm animals	23 (18%)/ 74 (57%)	56 (34%)/ 56 (34%)	6 (22%)/ 11 (41%)	20 (25%)/ 23 (29%)
		Horses	32 (25%)/ 74 (57%)	69 (42%)/ 64 (39%)	14 (52%)/ 7 (26%)

**Table 5:** Mean PI, MN, and UP scores for VetDIT versions 1 and 2 and male and female third-year veterinary students

Schema	V1 %	V2 %	Male %	Female %	SED	p (version)	p (sex)
√PI	3.9	3.0	4.1	2.7	0.37	.01	.04
PI	17.9	14.1	19.6	12.4			
MN	32.7	38.3	35.3	35.7	3.19	.92	.12
UP	51.4	49.9	48.5	52.9	4.05	.46	.76

PI = Personal Interest; MN = Maintaining Norms; UP = Universal Principles; SED = Standard Error of the Difference between any two treatments

**Table 6:** Median PI, mean MN, and mean UP scores for VetDIT versions 2 and 3 and male and female first-year production animal science students

	V2 %	V3 %	Male %	Female %	SED	p (version)	p (sex)
Median PI	3.4	6.9	10.3	3.4		.020	.022
MN	35.6	33.1	36.5	32.3	2.31	.303	.250
UP	60.1	58.3	54.5	63.9	2.50	.488	.022

PI = Personal Interest; MN = Maintaining Norms; UP = Universal Principles; SED = Standard Error of the Difference between any two treatments



**Table 7:** Mean PI, MN, and UP scores (%) before and after ethics teaching

	First-year BVSc: 3-hour workshop		First-year BAppSc, internal: 50-min lecture		First-year BAppSc, external: online 50-min lecture		Third-year BVSc: 50-min lecture		Interaction SED	p (before/after)	p (course)	p (interaction)
	Before Mean %	After Mean %	Before Mean %	After Mean %	Before Mean %	After Mean %	Before Mean %	After Mean %				
PI	7.7 <sup>a</sup>	4.6 <sup>c</sup>	6.9 <sup>a,b,c</sup>	6.5 <sup>a,b,c</sup>	7.3 <sup>a,b,c</sup>	7.2 <sup>a,b,c</sup>	7.5 <sup>a,b</sup>	4.8 <sup>b,c</sup>	0.66	.002	.507	.021
MN	36.0 <sup>a</sup>	27.7 <sup>b</sup>	33.2 <sup>a,b</sup>	28.9 <sup>b</sup>	32.6 <sup>a,b</sup>	28.5 <sup>a,b</sup>	31.4 <sup>a,b</sup>	36.2 <sup>a</sup>	2.09	.026	.308	<.001
UP <sup>2</sup>	3695 <sup>b</sup>	4860 <sup>a</sup>	3742 <sup>b</sup>	4072 <sup>b</sup>	3883 <sup>a,b</sup>	4668 <sup>a,b</sup>	3892 <sup>b</sup>	3625 <sup>b</sup>	282.8	.005	.048	.003
UP	60.8	69.7	61.17	63.81	62.3	68.3	62.4	60.2				

PI = Personal Interest; MN = Maintaining Norms; UP = Universal Principles

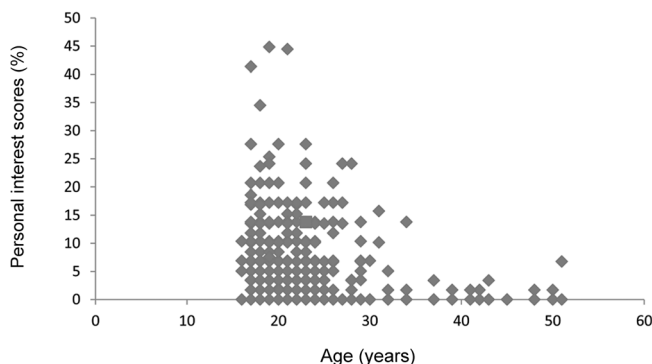
<sup>a,b,c</sup> Means within rows with common superscripts do not differ significantly ( $p < .05$ ) by Tukey's Multiple Comparison Test

**Table 8:** Student assessment of decision-making and ethical decision-making models

Objectives	Human continuum			Preston's Ethic of Response Decision-Making Model		
	Agree	Neither agree or disagree	Disagree	Agree	Neither agree or disagree	Disagree
1. Clarify my position	112 (76%)	26 (18%)	10 (7%)	118 (79%)	21 (14%)	10 (7%)
2. Modify my position	55 (37%)	58 (39%)	35 (24%)	87 (58%)	41 (28%)	21 (14%)
3. Clarify others' positions and ethical judgment	134 (91%)	11 (7%)	2 (1%)	125 (84%)	21 (14%)	2 (1%)
4. Be more aware of the complexity of making ethical decisions	120 (81%)	17 (11%)	11 (7%)	131 (88%)	12 (8%)	6 (4%)
5. Use ethical frameworks and principles	79 (53%)	41 (28%)	28 (19%)	131 (88%)	14 (9%)	4 (3%)
6. Improve my moral judgment skills	72 (49%)	65 (44%)	10 (7%)	110 (74%)	30 (20%)	9 (6%)

**Table 9:** Student assessment of teaching ethical decision making in first year, in small groups, and as the program progresses

	Strongly agree	Agree	Neither agree or disagree	Disagree	Strongly disagree
1. Develop ethical decision making skills in first-year vet course	65 (45%)	61 (43%)	11 (8%)	5 (3%)	1 (1%)
2. Small-group sessions for practicing ethical decision- making skills	52 (36%)	73 (51%)	11 (8%)	6 (4%)	1 (1%)
3. More sessions addressing animal ethics issues identified in various aspects of veterinary work as the program progresses	31 (22%)	65 (45%)	37 (26%)	7 (5%)	3 (2%)



**Figure 1:** Relationship between age and Personal Interest scores (%)

with a previous degree had higher mean UP scores than students without (65.3, compared with 62.0 for no previous degree;  $p = .057$ ). Students whose primary language was not English had higher mean MN scores (33.8 compared with 29.8 for English as primary language;  $p = .030$ ), and lower UP scores (61.2 compared with 66.0,  $p = .014$ ).

## DISCUSSION

Veterinary ethics curricula in three European veterinary schools have been divided into four main concepts: animal welfare science, laws and regulations, professionalism, and theories and concepts (including the history of veterinary medicine).<sup>22</sup> While all of these topics have a relationship with ethics, either informing ethics (i.e., animal welfare science and theories and concepts) or being informed by ethics (i.e., laws and regulations and professionalism), they are not addressing ethics as a separate knowledge and skill set, a scientific study of morality and moral behavior that is grounded in moral philosophy and moral psychology. In reviewing use of these fields in other professions, it is our opinion that veterinary ethics teaching should involve developing and assessing capacity for ethical behavior and leadership in relation to animal ethics issues, which are central to veterinary work, through the knowledge and skills of moral behavior components (i.e., moral sensitivity, judgment, motivation, and action).<sup>23</sup>

This study helped refine and validate a new veterinary-specific measure of moral judgment, the VetDIT.<sup>3</sup> The VetDIT draws upon the development and validation of the original DIT over 25 years,<sup>6(p.vii)</sup> and refinement and validation of the new VetDIT will also require an ongoing development process. Establishing comparability between the original Version 1 and the refined Version 2 in this study enabled moral judgment comparisons longitudinally between first- and third-year veterinary science students. Establishing comparability between Versions 2 and 3 enabled these two tests to be used before and after ethics teaching interventions to identify moral judgment development, and to avoid careless or repetitive responses from having to complete the same test. While two of the three reasoning schemas, which were those most used by students, were comparable, PI reasoning was different

between the versions and had to be statistically adjusted. This suggests that some further review of the suitability of PI questions in Versions 2 and 3 would be helpful.

This study also tested the VetDIT using two of Rest's construct validity criteria: sensitivity to interventions designed to improve moral reasoning (i.e., showing pre- and post-test gains) and upward change in a longitudinal study. In our study, veterinary students exposed to two hours of an initial VetDIT and ethics lecture, followed by an intensive three-hour small-group interactive workshop, increased their UP scores from 60.8 to 69.7 (Table 7), a shorter time than the necessary 20+ hours of small-group case study discussion in a medical ethics course to achieve a significant change (of approximately five points) in generic DIT UP scores.<sup>24</sup> The fact that these UP scores are higher than usually observed for human scenarios confirms our earlier observation that veterinary students do utilize universal principles more extensively for animal scenarios than for human scenarios.<sup>3</sup> Students in our study who completed the initial two hours of VetDIT and ethics lecture, and the 50-minute lecture covering similar content on moral judgment and ethical decision making, did not increase their UP scores. The difference between these two interventions was the use of interactive teaching strategies and small-group discussion (in groups of three) in the workshop, requiring decision making and justification, guided by moral development stage theory and the cooperative use of the Ethic of Response Template (ERT) (Table 3). It is possible that the increase in UP scores in our workshop program, in a shorter period than observed for students in the medical ethics course, is due to a more direct and focused use of moral knowledge and skills along with the small-group interaction. Although the medical ethics program asked the faculty members who were not trained in ethical theory to encourage students to take a position on each moral dilemma and defend it,<sup>24</sup> in our workshop, students were given the theoretical basis for moral development from personal interest to universal principles reasoning and a model that guided their use of the predominant ethical frameworks and principles (Table 3).

The extent of growth in VetDIT scores through this ethics teaching intervention is noteworthy in that it is similar to the average progress in UP scores between high school and college students, and between college and graduate students (mean UP increase of 10) on Rest's original human scenario DIT.<sup>19</sup> While some veterinary ethics courses take a pluralist approach and aim "to help students recognise their own ethical viewpoints as a means to develop a personal identity,"<sup>25(p.353)</sup> we exposed students to the science of morality through moral development theory and encouraged "the standpoint of the impartial spectator or ideal observer,"<sup>26(p.12)</sup> using an amalgamation of the main philosophical approaches as complementing rather than competing with each other.<sup>27(p.460)</sup> Penn achieved similarly high levels of growth through "direct and focused approaches to moral education" using "moral development theory, stage typology, and philosophical methods of ethical analysis and their application to social issues,"<sup>14(p.136)</sup> with peer discussion of moral issues less effective, as were general

courses in humanities, and political/social sciences. McNeel also achieved similar growth in a general education ethics course with senior college students (mean UP increase of nine) using Penn's approach.<sup>13</sup>

Using animal rather than human ethics scenarios in both the teaching and the DIT may also be more effective for veterinary students whose main motivations for taking the course are "to work with animals," to "help sick and injured animals," and to "improve the way animals are treated."<sup>28</sup> It enabled students to transfer their learning from small-group work, using the various philosophical approaches on animal ethics issues to apply these to the VetDIT. Students' positive response to Preston's model and small-group work in the first year, and to addressing animal ethics issues as they arise in future years, further supports this approach.

This study suggests that students' moral judgment is not progressing during the veterinary program. While the VetDIT demonstrated construct validity by identifying moral judgment development with a specific ethics teaching intervention, there was no improvement in the PI, MN, and UP scores of veterinary students between first and third year, for both human and animal scenarios. Previous studies using the DIT or Kohlberg's Moral Judgment Interview human scenarios have also shown a lack of moral judgment growth during both veterinary and medical programs,<sup>8,9,11,12</sup> despite students showing growth in many other university programs, particularly in liberal arts programs.<sup>5,7</sup> Another study, in which students increased their DIT UP scores by 6 points following a first-semester medical ethics course, showed a smaller change of 2.8 points over the subsequent three years of the veterinary program,<sup>29</sup> the latter change being one regarded as normal and expected in this age group over that period.<sup>30</sup> The third-year veterinary students had completed a two-hour workshop in a large group setting to test three interactive ethical decision-making strategies in their first year.<sup>3</sup> It is possible that initial growth occurred but was not retained. Previous medical ethics research suggests that "ethics education should be integrated throughout the curricula and viewed as a process."<sup>16(p.1149)</sup>

Demographic variations in moral judgment scores on the VetDIT animal ethics scenarios were mainly aligned with those in previous studies using human ethics scenarios. Higher animal ethics PI scores for males in third-year veterinary and production animal science, and lower UP scores compared with females on the same course, aligns with male veterinary students' lower UP scores on human ethics issues.<sup>17</sup> A meta-analysis of 56 DIT studies (>6000 subjects) found that females had significantly higher moral reasoning scores than males, but the difference is small, whereas age/education were more influential.<sup>31</sup> Our study supports previous research, which has found that PI judgment decreases with age (Figure 1) and that those with more education in general have higher UP judgment.<sup>6</sup> Our students with English as their primary language had lower MN scores and higher UP scores on animal issues than students whose primary language was not English. In contrast to this, cross-cultural human DIT studies found similarity of age/educational trends across cultures<sup>32</sup> and that Kohlbergian stages are universal.<sup>33</sup>

## CONCLUSIONS

In a review of medical ethics education, Eckles et al. identified "a lack of systematic analysis of the measurable elements of ethical skills and the best means for assessing them" and suggested that "educators should consider whether the ethics skills taught should be distilled into a competency."<sup>16(p.1150)</sup> In veterinary education, there has been a similar lack of measurable elements. The VetDIT provides a measurement tool for assessing progress in moral development in veterinary ethics education. In terms of understanding and using higher stages of moral reasoning and applying a unified model of ethical frameworks and principles to determine the most fitting ethical decision, moral judgment development can be enhanced by a short, intensive session provided it includes small-group interaction. Providing the same information in a lecture format is not effective in promoting moral development. Moral judgment on animal and human ethics issues did not develop between years 1 and 3. Further work is needed to assess retention of moral judgment development and to ensure that the information and tools are transferrable and useful in veterinary practice.

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## CONFLICT OF INTEREST

No organization played any role in the development of this study design, analysis, or interpretation of data, or in the decision to submit this manuscript for publication. None of the authors have any financial or personal relationships that could inappropriately influence the content of this paper.

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