Ethics, Political Perspective Taking, and Digital Games

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Abstract

Someone who approaches an ethical problem must do so with complex logic, reasoning, and argumentation skills. While historically people were praised in these skills, time and technology has changed their significance and diminished opportunities for their application as we live in a world with soundbites and popular opinion pieces. Digital technologies have not only increased ethical dilemmas, they also have facilitated a social restructuring that limits ethical engagement through pursuit of quick access and faster decisions. Policy arguments and political perspective taking is one such instance of ethics wherein the effects are felt daily but people are not engaged in the way they once were.

Educators have reported that students often fall back on simplistic, partisan explanations for their support or rejection of a given policy. In an effort to increase ethical reasoning when it comes to evaluating public policy, we are investigating how well students are able to evaluate public policy from multiple ideological perspectives. To this end, we conducted a study to test a perspective taking survey measure to be used in evaluating interactive digital educational games that teach ethics, with the goal of addressing challenges for students faced with digital ethical dilemmas. In the first and second phase, we developed an online survey and then conducted it with 187 college students at a private research institution. The survey asked students to evaluate four policies from five different ideological perspectives. We found that students have a range of ability in reasoning, some ideologies are harder to reason about than others, prior knowledge and civic participation is predictive of performance, and being an independent does not significantly influence reasoning. In the third phase of the study, we describe initial work towards designing a digital game to improve student perspective taking skills, and a discussion of how these findings might help others design educational materials to promote civic reasoning. This work furthers
our understanding of how students develop civic reasoning skills and how we can use digital technologies to help engage citizens to analyze ethical dilemmas.
Digital technologies such as the internet, video, and animation now make it possible for greater numbers of citizens to engage in public debate about public policy—taking positions on issues such as global warming, income inequality and war. However they often seem to lack the reasoning ability needed to understand the ethical ramifications of creation and use of these technologies. Likewise, designers/engineers of new digital technologies are often unaware of the ethical, political, and legal impacts of the new digital technologies they create, ramifications such as news reports of individuals being fired from their jobs based on their Facebook posts. In both cases, citizens and designer/engineers may often be oblivious to, exacerbate, or even create ethical problems because they cannot predict ethical impact of their use and invention of new digital communication technologies. However, citizens (users) and engineers (designers) must be able to reason about ethical implications of digital communication technologies if we are to avoid the negative ethical impacts of these technologies. We believe that while citizens and designer/engineers need to understand this impact, we may be able to also use these same technologies to teach students how do this reasoning.

In teaching students to use digital media to educate and engage their peers in political topics, we have found that students often lack basic fluency in ethics needed to develop principled and persuasive political messages. For example, students often seem to rely either on gut intuition, (e.g., “I feel like income inequality is wrong, but does that mean I should give my money away?”) or oversimplify issues into partisan positions, (e.g., “Well, I’m a Democrat, and the author is a Republican and clearly biased.”) We believe this may in part come from lack of practice in engaging in critical thinking skills that are tied to ethics and civics.

In this project, we consider how we might use digital technologies for improving citizens’ ethical reasoning about policy issues, including: how might we assess ethical abilities, whether
students do indeed face challenges in learning to reason ethically, and how we might develop web-based educational games to improve ethical reasoning. Such knowledge will further our understanding of the role of digital technologies in ethics and help educators better prepare citizens to deal with the ethical dilemmas raised by digital technology.

BACKGROUND

Communication Ethics. Communication ethics scholars argue that every part of the communication process is complicated by and imbricated with ethical issues (Jensen, 1997). The Internet and other mediated communication technologies, including digital games, have increased communication and interactivity and therefore increased potential for interaction with ethical issues or created new ethical considerations altogether. Furthermore, digital spaces may be experienced as different from embodied life and those who inhabit these spaces may create unique, negotiated ethics or abandon ethics altogether (Carroll-Mayer and Stahl, 2008).

The crux of this problem, however, is that people must be taught perspective taking skills that may be transferred to new domains and spaces. Ethics educators have reported on challenges in teaching ethics in college classrooms, relating that students use nascent reasoning skills that leads to reductive ethics (Cohen-Almagor, 2008 and Wyatt, 2008); civics education faces similar challenges of overcoming being simply a “government” class that does not help students to reason about ethical dilemmas created by digital technologies and policies, to one that educates students about the citizens’ role in society, where ethical dilemmas are commonplace (CIRCLE, 2003). Likewise, in political science, there have been recent calls to include civic reasoning skills in measures of civic understanding (Boudreau & Lupia, 2010; Lupia, 2002). Digital citizenship requires students to apply their civics skills and knowledge to an increasingly
digitally-mediated world (Bennet, 2008), and though digital ethics scholars identify cyberspace as an outlier, we believe that ethical skills may be applied to emergent digital ethical dilemmas. Digital spaces complicate these skills by changing relations to time and space, enabling communities where social and ethical norms may not be shared across participants, as time and location are displaced. In order to negotiate these unique situations, people must first be able to critically engage with the situations they enter by being taught these skills.

Fortunately, digital technologies not only increased ethical concerns, but also increased opportunities and designs for teaching. Digital games are prime for this type of work because, as Schrier and Gibson show, they are fun, effective, easily repeatable, educational, offer experience (not prescription), and support experimentation (2010). Others have further argued that we can leverage the power of games to improve social and ethical problems such as poverty, internet security, and climate change (McGonigal, 2012). Our goal then is to leverage the affordances of digital games to teach transferable reasoning skills to learners, who then may apply them to other ethical dilemmas.

**Policy arguments.** For our purposes, we focus on civic reasoning and perspective taking. Much of this civic reasoning centers around *policy arguments* (Dunn, 1990; Fischer, 2007; Manzer, 1984; Stone, 2001; cited in National Research Council 2012), which are “practical arguments that offer reasons for taking specific policy actions” (Ball 1995 cited in National Research Council 2012).

Policy arguments require citizens to connect and compare different actions, which are in turn supported or opposed by different ethical values (Lebacq, 1986; Sandel, 2010). For example, a policy of taxing the rich and redistributing this income to the poor will be supported or opposed depending on one’s ethics: some may argue that this policy infringes upon one’s
liberty to own the fruits of our labor, while others argue that justice demands some income
distribution to ensure equality of opportunity and a more broader sharing of benefits, while still
others argue, often on religious grounds that justice demands preferential consideration for the
poor.

Skilled arguments thus requires citizens to confront complex ethical questions and
tradeoffs. Citizens who lack this ethical foundation are at a distinct disadvantage -- they have
difficulty articulating the values behind their own argument (which are essential to creating
persuasive arguments, Lakoff, 2002), and will have little success understanding how their
audience will respond to their arguments or the legitimate basis upon which their opponents will
criticize their positions.

Perspective taking. In this project, we focus on a key skill of policy argumentation: political
perspective taking. By which we mean a citizen’s ability to predict whether another person will
support or oppose a policy action based on that person’s values. This focus comes from a number
of public and academic thinkers who have identified a lack of civic reasoning skills (such as
perspective taking) as a barrier to mutual understanding between individuals with different
ideologies (Haidt, 2012; Lakoff, 2002; Western, 2008) -- a barrier that must in some way be
resolved to solve ethical and political problems.

In political science research, perspective taking has been linked to sociotropic reasoning
skills and political sophistication. Sociotropic reasoning involves taking the perspective of the
nation as a whole as opposed to simply using one’s personal circumstances when making a
decision. For example, a sociotropic voter will ask political leaders “not 'What have you done for
me lately?' but rather 'What have you done for the country lately?' and, 'What are you likely to do
for the country in the future?' (Kinder, 1981).
Civic standards (CIRCLE, 2003; Gould 2011) recognize perspective taking as an important skill. The Civic Mission of Schools identifies four common traits, three of which include perspective-taking. These standards argue that competent and engaged citizens are: *informed and thoughtful*, including “… a willingness to enter into dialogue with others about different points of view and to understand diverse perspectives…”; *participate in their communities* including “… pursu[ing] an array of cultural, social, political, and religious interests and beliefs”; and possess *moral and civic virtues*, that is, “they are concerned for the rights and welfare of others, socially responsible, willing to listen to alternative perspectives... [and] strike a reasonable balance between their own interests and the common good.” (Gould 2011; p. 11).

Policy analysts also recognize the role of perspective taking in select among policies. In most policy analysis models, analysts must select a criteria by which to select a policy option (Bardarch 2012; Jansson, 2011; Clemons & McBeth, 2000). These criteria include practical and political considerations and, more importantly, ethical criteria such as freedom and equality based on different theories of justice.

**Measures of perspective taking.** Despite the importance of perspective taking in civics, policy and political science, we know of no measure that would allow us to assess students’ ability to reason about perspective taking ability. Therefore, we have little understanding about students’ ability to reason about their own ethical perspectives, or about unfamiliar perspectives, ones that they may encounter less frequently in their immediate peer group, the media, or other cultures.

The lack of a measure for perspective taking makes it difficult for educators to evaluate educational interventions and activities to promote these skills. Therefore, in order to develop digital technologies for improving students ethical reasoning ability, we must also develop empirical measures of perspective taking ability.
Research questions. In this study, we ask: “how might we design digital technologies that prepare citizens respond to ethical dilemmas of justice in the public sphere?” Specifically:

1. How might we assess students’ ethical reasoning about policy?
2. How well do students actually reason about ethics? including:
   a. General skill. How well do students reason about different political values?
   b. Value difficulty. Are some values more difficult to reason about than others?
   c. Who. Do some groups of students reason better than others?
   d. Bias. Are partisan students more likely to use directional partisan bias in their reasoning about political values?
3. How might we design digital, educational games that improve students’ abilities to reason about ethical issues in policy?

With respect to general skill (2a) in reasoning about political values, we predicted that there would be a wide range of with only small number of students showing proficiency, based on our anecdotal experience with teaching students to make policy arguments with digital technologies.

With respect to value difficulty (2b), we predicted that some political values would be more difficult to reason about that others (later referred to as hypothesis 2b.1). Some political values, like “liberty” are regularly discussed and are simple to apply to a particular policy. For example, it is easy to determine whether a policy like a “banning assault weapons” increases or decreases one’s liberty to buy guns. We predict that students will best be able to take the liberty perspective during the survey (hypothesis 2b.2). Other political values, like “utility,” the cost-benefit of a policy action, are also regularly discussed, but more complicated to apply. They require one to define the particular types of “happiness” at play and to consider different tradeoffs. Yet other political values should be difficult to reason about because they are
unfamiliar. For example, we expect Western students to have less familiarity with the values of “filial piety” embodied in ideologies such as Confucianism. Therefore, we believe that Confucianism will be most difficult to reason about (hypothesis 2b.3).

With respect to who (2c) reasons better, we predicted that the following groups should be better able to reason about perspectives, people who: (i) major in political science, (ii) have greater political participation and knowledge, (iii) read more news, and (iv) have greater campaign activity, would reason better about political values. Political science students, having studied politics and policy, should have a greater ability to reason about political values. Higher participation in civic life would predict higher score, reflecting not only interest in the area, but also experience. Finally, more conversations and news sources will lead to higher performance because those individuals have a higher possibility of experiencing a diversity of perspectives. (Mutz & Mondak, 2006).

With respect to bias (2d), we predicted that students who self-report their political party as “independent” will reason better about political values than partisans based on two assumptions. First, students who have a party affiliation will be unable to perspective take with an ideology outside of their own. Second, independents, with no tie to a particular ideology, will be better able to take on multiple different ideologies and reason with them. Other work investigating citizens’ ability to reason about issues such as affirmative action and gun control has shown that citizens with strong ideological ties tend to uncritically accept confirmatory evidence, but argue against contrary arguments (Taber & Lodge, 2006). We believe being able to reason from multiple different perspectives will mitigate the effects of cognitive bias in political reasoning processes.
METHOD

General Context. In this project, we sought to understand and develop digital games for increasing the perspective taking abilities of university students in the domain of policy and politics. Our students are primarily aged 18-22 and attend an elite, private Midwestern University. They study a variety of majors including political science, social policy, learning and organizations as well as a variety of majors which do not directly address issues of policy and politics. We seek to design digital games for educational interventions to be used primarily (but not limited to) university courses in policy, politics and (civic) journalism.

Design-based research. In this project we take a design-based research (DBR) approach to: produce knowledge about students’ ethical reasoning abilities that will prove useful for designing educational interventions; develop a digital game for improving students ethical reasoning abilities; and to generate empirically-grounded, theoretical design principles for teaching perspective taking. DBR (Brown, 1992; Cobb, Confrey, Lehrer, Schauble, & others, 2003; Plomp, 2009) requires iterative cycles of defining design arguments (hypotheses), implementing the design argument, collecting data, evaluating the design, and refining the design argument. While DBR cannot establish causal claims of the strength produced by randomized controlled experiments, it allows us to explore a larger portion of the design space to more quickly reject ineffective design hypotheses, which is appropriate for an exploratory project on perspective taking.

Here we describe three design-based research iterations. In the first iteration, we sought to develop a measure of political perspective taking. In the second iteration, we used this measure to assess students political perspective taking abilities, both to check whether our anecdotal observations of students’ abilities were accurate, and to generate insight into which
aspects of perspective taking are most challenge for which groups. Because of the challenges uncovered in the second iteration, we proceeded with a third iteration in which we developed a paper prototype for a digital game for teaching political perspective taking.

**PHASE 1: Developing a measure for perspective taking**

**Research Question.** In the first phase of the project, we sought to develop a diagnostic measure of political perspective taking that would allow us to better measure students' ethical reasoning in the policy domain. The measure would allow us to determine whether our anecdotal data about students' learning challenge in ethical reasoning represent a real problem (phase 2) and also provide a means to testing digital technologies for improving students' ethical reasoning skills (phase 3). Ideally, we wanted a measure that provides an authentic test of a student's ability to determine the desirability of a particular policy according to different political values; measures the students ability to reason about specific values; is relatively easy to score; and can also capture students' qualitative reasoning.

**Measure development.** To design the survey, we spoke with civic educators about their experiences teaching students how to both design and reason about policy interventions and examined texts on justice (e.g., Sandell 2010, Lebacqz 1986) to identify core political values specifically applicable to policy argument and analyzed policy texts (e.g., Bardarch 2012, Jansson 2012; Clemons & McBeth, 2000) to examine how ethical reasoning is applied to the policy making process.

We then designed a survey in which the respondent is asked to determine whether a set of policies (on topics such as immigration or gun control) will be supported or opposed by different semi-fictional political parties each of which represents a core political value (such as “liberty”).

We then iteratively refined the measure through 5 think-aloud sessions (van Someren 1994; Ericsson & Simon 1984; Lewis, 1982) in which a researcher asked undergraduate political science majors to take the prototype survey while “talking aloud” about their reasoning. In the think-alouds, we identified several low-level usability problems (such as font size and availability of descriptions of ideologies) as well as more substantive issues, such as ensuring an appropriate amount of detail specified for each policy example to support reasoning, and the need for a “Cannot make an argument” condition. We then revised the survey to include enough detail so students could make a decision for each ideology’s stance on a policy, and account for other usability issues. In addition we made adjusted the policies to increase their diagnosticity, by making sure that no two ideologies had the same set of responses across all four ideologies (see Table 1).

**Political perspective taking measure.** The final measure is described in Figure 1 and consisted of 5 fictional parties representing a core political value and 4 policies. For each party/policy pair, the survey asked the student “how would the party respond to the [policy]?” with the possible responses: support, oppose, depends, or cannot make an argument?. After each responses, students were also asked to explain their answers in a short answer field.

### Parties
- **The Libertarian party:** Strives to minimize coercion and maximize liberty and freedom for all people, across borders.
- **The Utilitarian party:** Advocates maximizing overall happiness. Above all other considerations, a policy is judged based on whether or not its resulting outcome maximizes overall happiness (concerned with economics, access to services, freedom, security, and privacy).
- **The Liberation Theology party:** Advocates liberating the poor and oppressed from unjust political, economic, or social conditions.
- **The Egalitarian party:** favors equality among living entities.
- **The Confucianist party:** Emphasize stability, family values (including respect for elders), and an obligation for altruism and humaneness towards other individuals within its own community.

### Ideologies
- SB 4567: Gun control
● Currently, people under 30 years of age cannot own a gun, and people over 30 years of age can own a gun for hunting purposes only after government approval.
● The new policy will overturn the existing policy and make guns legal for everyone
● It is projected this new policy will increase gun-related deaths, and have no significant impact on crime
● Opinion polls show that the majority of citizens like the current law

SB 3456: Immigration
● Only people with advanced degrees are allowed to immigrate into the country
● Those who immigrate must be employed; any period of unemployment that lasts 90 days will result in loss of immigration status and deportation
● It is projected that more people with advanced degrees will improve our nation’s leadership in research and development
● The immigrants with advanced degrees will mostly be filling positions for which there are no qualified citizens
● The immigrants’ country of origin will be unable to fill jobs because of emigration

SB 1234: Health Care
● Government provides free healthcare to all its citizens
● This system is funded by an extra 3% tax on households who make over $150,000 per year. Households that make less than $150,000 per year will not be taxed.

SB: 2345 National Security
● In efforts to increase security measures after a recent bombing, all public places will have surveillance cameras that transmit streaming video data to police departments, and all internet usage will be monitored.
● The system will cost 1% of the national GDP
● Opinion polls show that 75% of the population is worried about the cameras infringing upon their right to privacy and freedom of speech
● It is projected that these cameras will decrease crime in all neighborhoods
● This will likely result in more incarceration of the poor because they are less likely to defend themselves in court

Figure 1. The survey consisted of 5 fictional parties and 4 policies.

The expected answers are described in Table 1. Note however, that depending on the students’ political sophistication and the ill-defined nature of policy and ethical reasoning, there are several cases where the student could provide a justification for a response not in Table 1 that could be considered correct.

Table 1. Survey answer were designed so that ideologies differ in their support for policies

<table>
<thead>
<tr>
<th>Political value</th>
<th>Health Care</th>
<th>National Security</th>
<th>Immigration</th>
<th>Gun Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>Confucianism</td>
<td>Support</td>
<td>Support</td>
<td>Support</td>
<td>Oppose</td>
</tr>
<tr>
<td>Libertarian</td>
<td>Oppose</td>
<td>Oppose</td>
<td>Oppose</td>
<td>Support</td>
</tr>
<tr>
<td>Utilitarian</td>
<td>Support</td>
<td>Oppose</td>
<td>Support</td>
<td>Oppose</td>
</tr>
</tbody>
</table>
PHASE 2: Students’ political perspective taking ability

In the previous iteration, we developed an assessment of political perspective taking ability that captures the reasoner’s skill at predicting how different political values support or oppose different policies. This measure was designed based on our anecdotal observations of the learning challenges faced by students in our classes as they attempted to develop their own policy arguments. The purpose of this iteration was to determine whether our anecdotal classroom observations reflect a general learning challenge.

Setting/Population. In this iteration, we surveyed students enrolled in political science classes at a large private University in the Midwest. Students enrolled in political sciences classes were required to participate in at least 5 studies each quarter, which included this study. The courses that have students in the pool require that they students complete the surveys as one of their course requirements; consequently, participation in the surveys affects the students’ course performance.

Research design / Intervention. In this iteration, we assessed students’ political perspective taking ability using the measure developed in the previous iteration, using a single-group observational study design.

The study was delivered as an on-line Qualtrics survey in two waves. In wave 1 students completed the political perspective taking measure. Three weeks later, the same group of students completed wave 2. In wave 2, students completed selections from “Evaluations of Government and Society” from the American National Election Study (2013).
We collected 206 responses, of which 187 were used for analysis. Some subjects had left the pool and some subjects had joined the pool by the second wave. After matching all respondents who had complete responses to the first and second wave, we had 187 complete responses.

**Data Collection and Analyses.** For this study, our measures included:

- **Political perspective taking:** Our primary political perspective taking survey asked students to predict whether 5 different political values (liberty, utility, egalitarian, liberation theology, confucianist) would support 4 different policies, for a total of 20 questions.

- **Political knowledge:** A four item scale from 0-4 made of multiple choice questions such as who is the Prime Minister of the United Kingdom, and who is the Speaker of the House of Representatives?

- **Political participation:** A five item scale, each item with a five point Likert scale response, ranging from 5-30 with questions like likelihood of attending a political meeting, donating money, or distributing information.

- **News sources:** A four items of select all that apply, covering major television shows (such as Good Morning America and Hardball), websites (such as Yahoo.com and CNN.com), radio programs (such as Glenn Beck and The Mark Levin Show), and print material (such as USA and Wall Street Journal). The total possible responses ranged from 1-61.

- **Demographic variables:** Several questions, covering topics such as age, sex, and major in school.

Based on our initial hypotheses, we conducted four analyses to answer the following questions:

1. **General skill.** How well do students reason about different political values?

2. **Value difficulty.** Are some of political values more difficult to reason about than others?
3. *Who reasons well.* Do some groups of students reason about political values better than other groups?

4. *Bias.* Are partisan students more biased in reasoning about political values, i.e., are “Independents” better reasoners?

**Findings/Results**

**Descriptive statistics.** Of the 187 students completing the survey 50.2% were male. The age of participants spanned from 17 to 25 (avg = 19.54, SD = 1.14). Of total respondents 22.45% are either majoring, double majoring, or minoring in political science (the other respondents are currently enrolled in a political science class and have either not declared political science yet or are not majoring, double majoring, or minoring in political science). On the knowledge scale (4 items, a scale of 1-4), respondents reported a mean = 3.19, SD = .83. Number of news sources, a sum of a number of questions asking about specific news in print, on television, on radio, and online, ranged from 0-35 (mean = 10.20, SD = 6.02). Participation in politics was also distributed and captured with another sum of six items on a scale of 1-5, for a participation measure ranging from 5-30; the average participation response was 19.5, SD = 5.3.

**Analysis 1. General skill.** Our first analysis asked: *how well do students reason about different political values?* To answer this question, we looked at the distribution of the political perspective taking scores across all participants (which had maximum score of 20, i.e., 4 political values * 5 policies).

On average, participants scored toward the middle of the scale (M= 12.49, SD=2.81). No one in the sample scored 20 out of 20; the highest score was 18, with five participants.

This range of performance suggests that there are students who reason well and other students whose reasoning skills could be improved. It also demonstrates that the survey was
sensitive enough to pick up differences across a population, meaning that further analysis could provide insight into student performance. This supports the hypothesis 2a that there is a range of abilities for reasoning about policy through perspective taking.

**Analysis 2. Value difficulty.** Our second analysis asked: are some of political values more difficult to reason about than others?

To answer this question, we divided the political perspective taking score into several sub-scores for each of the ideologies and ran an ANOVA to determine if there was a difference among reasoning for each ideology. After examining the results, we followed up with a means analysis to determine if the differences were significant.

We found four significantly different levels: (1) libertarianism (M = 3.05, SD = .98), (2) liberation theology (M = 2.74, SD = .86), (3) Confucianism (M = 2.34, SD = .95) and egalitarianism (M = 2.34, SD = 1.00), and (4) utilitarianism (M = 1.99, SD = .94). For each pairing except egalitarianism and Confucianism, p < .002; for the egalitarianism and Confucianism pairing, p = 1.0. Our participants were best able to take the libertarianism (highest mean score) and proved least able to adopt the utilitarian perspective (lowest mean score). Liberation theology was the second easiest, and Confucianism and egalitarianism, with no significant difference in performance between them, were the third easiest (see Figure 1).

**Figure 1. Libertarianism was the easiest to value to understand.**
These results support hypothesis 2b.1, that some values are more difficult to reason about than others, and hypothesis 2b.2, libertarianism will be easiest to reason about; we must reject hypothesis 2b.3, that Confucianism is most difficult, because utilitarianism reasoning scores are significantly lower than Confucianism scores.

Analysis 3. Who reasons well? Our 3rd analysis asked: *do some groups of students reason about political values better than other groups?*

To answer this question we looked at participant demographics to see which variables predicted performance on political perspective taking. Because we ran our study through a political science survey pool, which includes majors and non-majors, we ran an ANOVA of the two groups.

There is a slight difference between the two groups, but it is not statistically significant, $F[1, 184] = .96, p = .40$, and we must reject hypothesis 3a.

**Table 2. Political science majors did not have statistically greater perspective-taking scores.**

<table>
<thead>
<tr>
<th>Major</th>
<th>N</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Political Science</td>
<td>42</td>
<td>12.88</td>
<td>3.05</td>
</tr>
<tr>
<td>Other</td>
<td>143</td>
<td>12.48</td>
<td>2.55</td>
</tr>
</tbody>
</table>

We then looked at gender to see if there is a difference between how men and women scored on the survey. We ran another ANOVA to compare the two groups and found that they were significantly different, $F[1,184] = 7.18, p = 0.15$.

**Table 3. Males had higher perspective-taking scores than females.**

<table>
<thead>
<tr>
<th>Gender</th>
<th>N</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>94</td>
<td>13.04</td>
<td>2.71</td>
</tr>
<tr>
<td>Female</td>
<td>91</td>
<td>12.09</td>
<td>2.54</td>
</tr>
</tbody>
</table>
Unsatisfied with gender as a definitive explanation of difference across the participants, we used theory to inform terms added to a linear regression. Our first regression included gender and age, assuming that ability to reason would increase with age. We found that gender remained significant with a probability of p = .01, and that age, though not significant, was strong enough to warrant a trend (p = .08).

Our second model added knowledge, a scale of four different items, to the previous model, assuming that as knowledge of the political world increases, so too would reasoning performance. We found that gender remained significant (p = .023), age increased in significance (p = .057), and knowledge was also significant (p = .018). The adjusted R square also increased by this addition to the model, from .043 to .066.

The third model added several terms that we believe would correlate with increases in score: political participation, another scale of two items; number of news sources, a total of tv, online, radio, and print news sources reported by students; campaign activity, another scale of four items; and familiarity with ideologies. Scoring higher on each of these terms suggests higher involvement with civic life and consequently perhaps better ability to reason with ideologies. The adjusted R square increased again to .1031, and the significance of gender went away. Three terms showed significance in this model, knowledge (p = .045), participation (p = .047), and familiarity (p = .01).

| Term                  | Estimate | Prob > |t| |
|-----------------------|----------|--------|---|
| gender [female]       | -.34     | .09    |
| age                   | -.25     | .16    |
| knowledge             | .50      | .045   |
| participation         | .08      | .047   |
| Num News Sources      | -.03     | .34    |
| Campaign              | -.02     | .93    |
This model suggests that hypothesis 3c and 3d cannot be supported, that number of news sources
(p = .34) and campaign activity (p = .93) do not have a significant effect on performance. This
model also demonstrates that the gender effect is going away as more variables are controlled for.
This suggests that performance is not based on gender but perhaps could be based on knowledge
and training, as suggested by the emerging significant terms.

**Analysis 4. Bias.** Are partisan students more biased in reasoning about political values, i.e., are
“Independents” better reasoners? To answer this question, we took self-reported party affiliation
data and ran an ANOVA on two groups, independent and other (a summary variable of other
parties reported) and found no significant difference, F [1,184] = .68, p = .41. We therefore reject
hypothesis 4, that independents would be better to reason about policy.

**Discussion**

In phase two of the research, our survey deployment and statistical analyses yielded
promising results for phase three, designing a learning intervention for these skills. For this
second stage of our research we are able to offer three contributions to the field: the measure
itself, the finding of educational need for improvement, and identifying different factors that
affect reasoning. Each of them offers a separate contribution in this research area, but together
they can all be used during our next stage of work.

Prior to this work, no known measure of political reasoning/perspective taking existed.
Our diagnostic aims to provide a starting point for civics research on political reasoning. Given
our first run of the survey and the results gathered, we feel confident that the measure was
successful in capturing a distribution across participants, suggesting that it is neither too hard, nor too easy.

In addition to being sensitive enough to capture a distribution, the measure also demonstrated that there is an educational need for political reasoning. Survey respondents, on average, are performing at a 62% rate, what would be considered failing in schools in the United States. Yet, at this age, these individuals are also participating and voting for policies and representatives that run campaigns and use political reasoning and ideologies in their everyday lives. To make better decisions in civic life, students must be better educated in how to reason through policy and understand arguments for and against policies.

Finally, with our measure we have been able to identify factors that influence performance on political reasoning. The three factors most strongly correlated with the outcome variable of overall performance were knowledge, participation, and familiarity with the ideologies. These factors suggest that perspective taking in policy reasoning is not an innate trait of an individual, but rather something that can be learned and practiced, and therefore improve. We plan on moving forward with this research to develop tutors and games to work on these skills.

**PHASE 3: DESIGN OF DIGITAL LEARNING TOOL PROTOTYPE**

The results of Phase 1 and 2 suggested that students have difficulty with political perspective taking and how to apply ethical values when reasoning about policy problems. Thus, Phase 1 and 2 demonstrate a need for an educational intervention to improve students’ perspective taking skills. The purpose of Phase 3 was to design a prototype for an interactive digital game to teach perspective taking skills.

**Design rationale**
We based our initial design of a digital game to teach political perspective taking in policy to undergraduates on several design principles:

- **Tutoring principle**: provide frequent step-level feedback
- **Minimal penalties principle**: decrease game-penalties for mistakes
- **Socratic principle**: expose the student to opposing perspectives
- **Fantasy principle**: embed the learning in a game-like fantasy environment

Our initial game design was inspired by work on cognitive games, digital ethics educational software and educational game design research. Studies of *cognitive games*, educational games that embed intelligent tutors (Van Lehn 2006; 2011) that provide immediate, step-level feedback, have shown that cognitive games are more effective than traditional entertainment game approaches to learning. So our initial design attempts maximize the frequency of feedback to the learner (Easterday, Aleven, Scheines & Carver 2011). Furthermore, *cognitive games* have also been shown to increase learning over traditional entertainment game approaches when they decrease the penalties for making mistakes (Easterday & Jo, in press) so unlike most games, our initial design does not punish players for making errors.

The design was also inspired by another multimedia program for teaching ethics developed in the late 90s called: *A Right to Die? The Dax Cowart Case*. This *Right to Die?* CD investigates a burn patient’s request to be allowed to die through a guided inquiry and videos of contrasting viewpoints. Cavalier & Weber (2002) compared the effectiveness of the interactive *Right to Die?* software with text and film versions of the material and found that students who used *Right to Die?* group learned more than those who used the text or film versions. Therefore our initial design presents the student with contrasting viewpoint as a way to learn political perspective taking.
Finally, we also use a fantasy context in our design based on the work of Cordova and Lepper (1996) showing that adding a fantasy context to educational games increased learning and motivation.

**Game Prototype**

As customary in human-centered design and player-centered game design, we implemented our initial design as a *paper prototype* (Rettig 1994; Schell 2008; Fullerton, 2008; Martin & Hanington 2008) in which the screens of the game are drawn on paper with the researcher simulating the role of the computer.

Players play the role of the conference organizer at a policy exchange council that consists of panels discussing which policies the council will approve or reject. The players’ job is to organize panels of speakers who will debate different policy issues on national television. In order for the player to keep her job, she must construct panels that will be _as contentious as possible_, expressing the widest range of opinion on the policy issue--not only to ensure abroad debate, but to keep ratings high!

![Diagram of game flow](image)

**Figure 2. Player flow through the game.**

The game begins with “video clips” (spoken aloud by the researcher in this prototype) of representatives meeting up at a conference to discuss new policies that are slated to be approved or rejected. Five members at the conference introduce themselves, each representing a different
ideology: Confucianism, Libertarianism, Utilitarianism, Liberation Theology and Egalitarianism. (Figure 2a). The player must then choose one of the members as her favorite “superstar” character that will appear on every panel, and is told that her job is to choose the members (0-4 individuals) who are most likely to disagree with his chosen character’s viewpoint on the four policies in the game: healthcare, national security, immigration and gun control. (Figure 2b).

The player then watches a brief tutorial, showcasing an example of how the rounds work using a different ideology and sample policy. The player also learns they will be allowed to use one hint per round which can be used to watch a video of a character’s previous stance on a policy from a previous newscast--this can be used to help decide who should be on the panel. (Figure 2c).

Each round begins with a video clip describing the policy (Figure 2d). When the video ends the player is asked if her character supports or opposes the policy (Figure 2e). After deciding, a video will play depicting their character stating their stance on the policy (Figure 2f). If the player is correct she may move on; if she is incorrect, she must decide if her character supports or opposes the policy once again to reaffirm her understanding of her character’s viewpoint.

Next, the player must choose the members to go on the panel whose opinions conflict with those of her superstar character (Figure 2g). At this time, the player is allowed to use her hint by clicking on any of the members to watch a video of her stance.

If the player is incorrect, a low viewer rating will appear and one video will play of a member with a contrasting viewpoint (Figure 2h) and she will then be asked to choose again. This step repeats until the player chooses the correct panel. However, if the player continues to choose an incorrect panel and the videos of the members run out a message will appear “sorry,
not everyone chosen disagrees with you on this policy. This is who you should have chosen.” At this point the player will move on to the next round, though their end score will be reduced.

If the player is correct (on Figure 2g), a high viewer rating will appear. A video of a member with a contrasting viewpoint will also play, but after this the player is ready to move on to the next round, which consists of a new policy and an empty panel that must be filled.

Setting / Participants
We tested the game with two graduate students from a private midwestern University. Neither student had a background in political science or policy.

Research Design
Using the paper prototype (see Figure 3) with two out of four of the policies, and tested it with the two students to gain initial feedback, using the *Wizard of Oz* (Kelley 1984) method in which the researcher plays the role of the computer, role playing the videos of the character stances, and fulfilling the role of the computer in moving players through the flow of the game.

As the students played the game, we used a think-aloud protocol (van Sommeran 1994; Ericsson & Simon 1984; Lewis 1982), in which participants are asked to voice the decisions they are making and their process of understanding as they navigate through a process or interface. This allowed us to gain insight about possible struggle points, and mismatches between designer intent and user understanding.

After the think-aloud protocol, a short interview was conducted in order to gain higher-level feedback about the enjoyability of the game itself, and ideas for how to extend its functionality.
Results

The think-alouds provided us with initial data and inspiration for working on future iterations of the game, which will eventually transition from a paper-based prototype to a digital game. After the think-aloud sessions, we grouped our observations into several categories that warrant future investigation.

Information Accessibility and Availability. We discovered several issues relating to Information Accessibility and Availability. By Accessibility and Availability, we refer to participants’ ability to access the information they need or want to interact with at a given point in the game to 1) make informed decisions and 2) support the learning goals of the game.

For example, one of the players preferred to read the descriptions as opposed to having them read aloud to her. She asked “Can I see their introductions? I am having trouble trying to remember what all of these introductions were.” The same player also had trouble keeping track of all the stances she heard and suggested to have the option to make all stances and introductions visible on one page to make it easier to reference them when choosing the panel. This may affect our decision, (described in the Game Prototype section), to rely heavily on videos to explain game content. In future iterations, we may want to include both video and text so that learners can access information in multiple ways depending on their preference.
Both participants had difficulty remembering what options they had chosen (i.e. what their characters’ stance was) as they progressed to the stage where they chose opposing stances to fill the panel, suggesting that this information should be made more accessible to the learner as well.

One participant also suggested having the option to hear every members’ stance to assist in future rounds, even if the correct panel was chosen. For example, after the second round she asked, “can you tell me what the Egalitarian thought?” This suggests that we need to ensure that learners have access to all the information they may need, to meet the learning goals of this intervention.

**Prior Knowledge and Complexity.** As players spoke aloud their thoughts and decision-making processes, we recognized the importance of prior knowledge of ideologies and politics they brought to gameplay.

For example, both players chose to play as a character that was either most in line with their personal beliefs, or one they were the most familiar with. One participant reported: “I am trying to select a character that is somewhat like me -- I am more familiar with her beliefs.” Both participants also wanted to explain their reasoning or use their personal prior knowledge even though it was not an option in the game. For example, one participant said: “My character supports this policy. Do you want to know why?”

Both participants found the description of the characters and some of the characters’ stances gave little insight into what the party stood for, or were too simplistic. When one player was asked if the description matched their prior knowledge of Confucianism he answered, “kind of...Confucians are about playing their role in society and not crossing that line. So, if you’re not in charge of the country then you don’t worry about the affairs [of others].”
Both participants also recognized that the level of depth of the ideologies in the game did not match the real life complexity of these ideologies. For example, when deciding which character to play, one participant mentioned “All of these sound like things I would be interested in, but I already know that this is only scratching to the surface what the parties represent.”

Additionally, participants wanted more information to represent the complexity of ideologies, and wondered whether or not there was truly a ‘right’ answer, evidenced by statements such as: “I don’t know if this is enough information for to say that taxes hinder liberty to help me understand what a Libertarian would think. I want to know why they feel this way”, and “Is there only one right answer or are there levels of where they may disagree?”

Some of the ideologies also posed more of a problem for participants because they were seen as more complex. After one player heard the Egalitarian stance he said, “I agree that it affects everyone equally. But, the result of the policy will cause the poor to be disadvantaged. So, I don’t see that as being equal.”

Another ideology that both students had a difficult time reasoning with was the Utilitarian ideology description, particularly when reasoning about the national security policy. One student commented, “These are tricky. What do you mean by maximizing good and overall happiness. Whose happiness are we talking about? It may make people who feel like they need the surveillance happy to know that people are being watched but people who are victims of law enforcement and profiling may not be happy. So, I have a problem with this utilitarian description.”

We also noticed that both participants tended to stereotype the opinions of each character based on the character’s location of origin, or the appearance of the character’s avatars. For example, one participant explained: “There’s a conflict between the ideology description and my
Prior knowledge of those beliefs. When I was playing this game I tried to restrict myself to the wording of the game, so that I am not drawing out of my personal background knowledge. I had stereotypes of their place of origin.” Throughout the game, this participant referred to one of the characters based on his location (e.g. “the Texan guy.”) In regards to the appearance of the character avatars, he stated, “I viewed the younger looking characters as more liberal, and the older looking ones as more conservative.”

Additional Findings. Both players chose to have a tutorial before beginning the game and both opted out of using hints in all rounds. Additionally, both had an easier time reasoning about the health care policy than the national security policy, choosing the correct panel on the first try for the health care policy but not the national security policy.

After interviewing both players, they both stated that the game had given them insight from diverse perspectives, which is in line with the goal of the game. For example, one participant reported: “I feel like this game really helps me understand the differences between political parties. It helps me see the connection between belief systems and what they would state during a conversation or debate.”

From our think-aloud sessions, we will direct our continuing design process towards addressing the issues raised in the above categories.

DISCUSSION

In this project, we presented three phases of design-based research research on the use of digital technology to improve student perspective taking skills: we developed a measure for perspective taking, using the measure we found that students face significant learning challenges in perspective taking, and designed an initial version of a digital interactive game.
In phase one we designed a survey to be used as a diagnostic for political reasoning through ideological perspective taking, with four hypothetical policies and five ideologies to make twenty different conditions. Iterating through a design process using think alouds, we clarified the definitions of the ideologies, the parameters of the policies, the targeted responses for each condition, and the survey length and feel. In phase two we sent two waves of surveys, our diagnostics survey and selections from an ANES survey, to a political science subject pool. We analyzed the 187 and found that there is a distribution of performance skills and certain terms are significantly predictive of performance. The results of phase two suggest the need for an educational intervention to improve students political perspective taking. Therefore, we moved to phase three, prototyping a digital interactive learning game. The current paper based prototype takes the form producing a television show for a live debate, with players choosing an ideological perspective to play as and determining which representatives from other ideologies would debate most with the player’s perspective.

This work furthers our understanding of how students learn to develop civic reasoning skills and how we can use digital technologies to help citizens to analyze the ethical dilemmas posed by digital technology in the public sphere.

**FUTURE WORK**

Future work will focus on four areas. First, we plan on coding the qualitative responses participants had about the policy/ideology pairings in order to develop a more fine-grained statistical model. Second, we plan to implement a complete digital version of the game. Third, we plan on deploying a field test version of the game in classrooms to get user feedback of game play. Finally, after improving the quality of the model and the game, we plan on doing a controlled experimental study with the game as a design intervention, to more rigorously test the
effectiveness of the game at increasing student’s ability to reason about political perspective taking.
References:


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APPENDIX: SURVEY

INTRODUCTORY PAGE:
Imagine that you are a policy analyst and that you live in a country with 5 different political parties:

- The Confucianist party: Emphasize stability, family values (including respect for elders), and an obligation for altruism and humaneness towards other individuals within its own community.
- The Libertarian party: Strives to minimize coercion and maximize liberty and freedom for all people, across borders.
- The Utilitarian party: Advocates maximizing overall happiness. Above all other considerations, a policy is judged based on whether or not its resulting outcome maximizes overall happiness (concerned with economics, access to services, freedom, security, and privacy).
- The Liberation Theology party: Advocates liberating the poor and oppressed from unjust political, economic, or social conditions.
- The Egalitarian party: favors equality among living entities.

Each of the following pages will introduce a bill and some details about it. Your job is to predict whether each party will support, oppose, or be conflicted about the different bills before congress and why. You are also provided an option, "cannot make an argument," if you cannot make any of these three arguments.

When providing your reasoning, please write as much or as little as you want; you are provided large textboxes so you will not get cut off. Keep in mind that the party has full control over whether or not the policy will be enacted and the party must make a public argument about their decision.

For example, lets say there is a bill with the following policy:

**SB 1330: The Protect Americans against Leviathans Act**

- Government’s main priority will be managing the military, police and emergency services
- All government involvement in economic policy will be eliminated
- Compulsory K-12 education and government funding for education will be eliminated.

For your analysis, you will write a short summary predicting how each party will respond to the bill. For example, let’s say you are making a prediction about the Libertarian party. You might write:

Libertarian:
Support [ X ]   Oppose [ ]  Depends [ ]  Cannot make an argument [ ]

Why?
_I believe that the Libertatianism party would generally support the above policy since it minimizes government control and maximizes liberty and freedom. This policy erases economic interference, creates more choice by removing compulsory education, reduces taxes, but still manages to keep military/police forces, so a government's minimum job to maintain a government is met._

PAGE 1:

**SB 4567: Gun control**

- Currently, people under 30 years of age cannot own a gun, and people over 30 years of age can own a gun for hunting purposes only after government approval.
- The new policy will overturn the existing policy and make guns legal for everyone
- It is projected this new policy will increase gun-related deaths, and have no significant impact on crime
- Opinion polls show that the majority of citizens like the current law

Confucianism:
Support [ ]   Oppose [ ]  Depends [ ]  Cannot make an argument [ ]

Why?

Libertarianism:
Support [ ]   Oppose [ ]  Depends [ ]  Cannot make an argument [ ]

Why?

Utilitarianism:
Support [ ]   Oppose [ ]  Depends [ ]  Cannot make an argument [ ]

Why?

Liberation Theology:
Support [ ]   Oppose [ ]  Depends [ ]  Cannot make an argument [ ]

Why?

Egalitarianism:
Support [ ]   Oppose [ ]  Depends [ ]  Cannot make an argument [ ]

Why?

PAGE 2:

**SB 3456: Immigration**
Only people with advanced degrees are allowed to immigrate into the country
Those who immigrate must be employed; any period of unemployment that lasts 90 days will result in loss of immigration status and deportation
It is projected that more people with advanced degrees will improve our nation’s leadership in research and development
The immigrants with advanced degrees will mostly be filling positions for which there are no qualified citizens
The immigrants’ country of origin will be unable to fill jobs because of emigration

Confucianism:
Support [ ]  Oppose [ ]  Depends [ ]  Cannot make an argument [ ]
Why?

Libertarianism:
Support [ ]  Oppose [ ]  Depends [ ]  Cannot make an argument [ ]
Why?

Utilitarianism:
Support [ ]  Oppose [ ]  Depends [ ]  Cannot make an argument [ ]
Why?

Liberation Theology:
Support [ ]  Oppose [ ]  Depends [ ]  Cannot make an argument [ ]
Why?

Egalitarianism:
Support [ ]  Oppose [ ]  Depends [ ]  Cannot make an argument [ ]
Why?

PAGE 3:

SB 1234: Health Care

Government provides free healthcare to all its citizens
This system is funded by an extra 3% tax on households who make over $150,000 per year. Households that make less than $150,000 per year will not be taxed.

Confucianism:
Support [ ]  Oppose [ ]  Depends [ ]  Cannot make an argument [ ]
Why?

Libertarianism:
Support [ ]  Oppose [ ]  Depends [ ]  Cannot make an argument [ ]
Why?
Utilitarianism:
Support [ ] Oppose [ ] Depends [ ] Cannot make an argument [ ]
Why?

Liberation Theology:
Support [ ] Oppose [ ] Depends [ ] Cannot make an argument [ ]
Why?

Egalitarianism:
Support [ ] Oppose [ ] Depends [ ] Cannot make an argument [ ]
Why?

PAGE 4:

**SB: 2345 National Security**

- In efforts to increase security measures after a recent bombing, all public places will have surveillance cameras that transmit streaming video data to police departments, and all internet usage will be monitored.
- The system will cost 1% of the national GDP
- Opinion polls show that 75% of the population is worried about the cameras infringing upon their right to privacy and freedom of speech
- It is projected that these cameras will decrease crime in all neighborhoods
- This will likely result in more incarceration of the poor because they are less likely to defend themselves in court

Confucianism:
Support [ ] Oppose [ ] Depends [ ] Cannot make an argument [ ]
Why?

Libertarianism:
Support [ ] Oppose [ ] Depends [ ] Cannot make an argument [ ]
Why?

Utilitarianism:
Support [ ] Oppose [ ] Depends [ ] Cannot make an argument [ ]
Why?

Liberation Theology:
Support [ ] Oppose [ ] Depends [ ] Cannot make an argument [ ]
Why?

Egalitarianism:
Support [ ] Oppose [ ] Depends [ ] Cannot make an argument [ ]
Why?