How Knowledge Seeking and Knowledge Chaperoning Impact Individuals and Societies

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Abstract

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A study that explores the relationship between how a person seeks knowledge and how they govern (chaperone) their use of knowledge in order to solve problems. This study graphically places participants on a novel chart referred to as a bidimensional knowledge matrix. In order to highlight differences in how liberals, conservatives, and political centrists view the world. The study provides insights into how these groups are alike, and how they are different. In particular it provides a framework for communication between the groups, both in terms of helping individuals learn and also in terms of helping them work together towards pragmatic solutions to common problems. The study shows demonstrable and repeatable patterns for how participants from each political ideology chart on this bidimensional knowledge matrix. It also provides evidence for a positive correlation between those persons who chart towards the center of this graph and success in five different categories of wellbeing.

Keywords: political ideology, tribalism, knowledge seeking, knowledge chaperoning, predicting success

Introduction

In a politically divisive climate where members of different political ideologies are moving against each other with increasingly fierce animosity. Identifying what drives misunderstandings between the two main political ideologies (conservative and liberal) and working to heal that divide has never been more important. In an effort to understand the driving forces behind this divide, the researcher identified and explored two distinct ways that people interact with knowledge. The first will be termed as knowledge seeking throughout this article, and refers to the sources that individual's trust as they look to acquire truth. The second domain will be termed as knowledge chaperoning throughout this article, and refers to how a person weighs the value of the various solutions to a problem. In order to fully understand this topic and the potential significance of the results, we must first briefly explore these two domains in greater detail. Beginning with knowledge seeking.

How human beings learn is not a topic that is new to science. Researchers have been developing theories surrounding the processes involved in learning for as long as we have gathered in complex societies. As far back as ancient Greece Socrates, Aristotle, and Plato provided generations of teachers with best practices in the field of education. Important contributions in modern times provided teachers with tools to understand the psychology of learners, the methods of organizing instruction, and how to motivate students. These include Maslow, (Maslow, 1943) Bloom and Webb, (Bloom, 1956) (Webb, 2005) B. F. Skinner

(Skinner, 1938) and many others. In more recent years, a great deal of research has also explored the positive correlation that exists between perceived teacher trustworthiness and how effectively students learn. (Goddard, 2000) Making it clear that learners are much more willing to learn content from sources that they deem as trustworthy. Extending this concept of trust into the domains of religion vs science is also not new to researchers.

Peter Harrison of the University of Chicago argues that the domain of modern science mainly revolves around answering questions relating to how the Universe functions, while the domain of religion revolves around answering questions relating to why the Universe exists. (Harrison, 2015) He suggests that while distinct and firm, this division is relatively new, and only evolved over the past 300 years. Prior to the modern era the questions of both how and why the Universe functioned as it does were answered equally by the same authorities. Barbour argues that this division became prominent in western society starting with the trial of Darwin in Great Britain and that it has continued ever since. (Barbour, 2000) With many since that time viewing science and religion as being mutually exclusive from one another.

With this in mind, let's now return to the focus of this study. Given that religion and science are both important aspects of modern life, that these institutions have been divided from each other in the modern era, and that they still each actively promote themselves often competing with each other as the ultimate source for knowledge, it is not surprising that this dynamic would serve as a means of creating societal division within the larger culture. With those more inclined to trust religion

falling on one side of a gradient and those more inclined to trust science falling on the other.

As each of these self-declared ultimate sources of knowledge actively lobby individuals to their side, it is likewise understandable that individuals would feel a great deal of tension even within themselves. Especially when these two sources appear to take opposite sides of an issue such as has been the case with issues like teaching evolution in public schools, abortion rights, same sex marriage, and so forth. Thus, religion vs science have created one axis of division in American politics. Which as stated earlier for the purpose of this study will be termed as "knowledge seeking," or how individuals seek and trust knowledge. Ie, are they more inclined towards trusting religion, or are they more inclined towards trusting science.

A second axis of division exists in modern American politics, and relates to how individuals chaperone their knowledge. There is still much debate within the scientific community regarding the role that ideology plays in determining the political party that a person ultimately affiliates with. With some of the research indicating little or no correlation between the ideology of a person and their political party (Malka, A., Lelkes, Y., 2010)(Baldassari, D., & Gelman, A., 2008) while other evidence shows that both ideology and personality do at least partially impact the political affiliation of individuals. For example, Carney, D. R., Jost, J. T., Gosling, S. D., & Potter, J. found that liberals tended to be more open-minded, creative, curious, and novelty seeking, whereas conservatives tended to be more orderly, conventional, and better organized. (Carney, D. R., Jost, J. T., Gosling, S. D., & Potter, J. f, 2008) Ashton, M. , Paunonen, S. , Helmes, E. , & Jackson, D. found that liberals tended to be more compassionate while conservatives tended to be more polite. (Ashton,

M. , Paunonen, S. , Helmes, E. , & Jackson, D., 1998) These and other similar studies seem to draw the same continuum between conservatives and liberals. Though they each name or label that continuum differently. For the purpose of this study this gradient will be referred to as compassion vs logic.

While there is data supporting a correlation between the political party and the level of compassion or logic that an individual exhibits, what is unclear from current research is how people chaperone or govern their usage of knowledge across this continuum. In this study chaperoning knowledge refers to how an individual weighs and ultimately judges the correctness or value of a potential solution to a problem. This study is not concerned with the intelligence or iq of a participant. Only with how they judge the value of a potential solution. Based on research already completed and cited earlier in this article it is presumed that liberals will be more likely to judge the value or correctness of a solution by chaperoning their knowledge with compassion. While conservatives will be more likely to judge the value or correctness of a solution to a problem by chaperoning their knowledge with logic.

It is assumed that in both ideologies (conservative and liberal) that there are an equal percentage of intellectuals, mid-level intellects, and lower level intellects. Yet, these groups look at the same societal problems, and make very different judgements regarding the value of potential solutions. If it is true that liberals chaperone their knowledge with more emphasis on compassion, then it makes sense that they would judge the best potential solution to a problem to be the one that appears to be most compassionate. Whereas, if it is true that conservatives tend to chaperone their knowledge with more emphasis on logic, then it

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makes sense that they would judge the best solution to be the one that appears to be most logical.

Just as knowledge seeking seems to divide American politics across religion and science, so too does knowledge chaperoning divide people across an axis of compassion and logic. Again, keeping in mind that the polar ends of this second axis could just as aptly be named emotion and organization, or empathy and structure, as other studies have referred to them.

By charting a representative sample of the population across these two axes (knowledge seeking and knowledge chaperoning) on a bidimensional knowledge matrix, it should be possible to observe statistical patterns that can be used to broadly describe the larger makeup of the American body politic. As well as the characteristics of individuals within that same context. In other words it should be possible to see what types of individuals make up liberalism, conservatism, and political centrism. As well as identify how specific populations of individuals within each quadrant of such a bidimensional knowledge matrix fare in life, in terms of income, education, emotional wellbeing and so forth.

Questions, such as whether belonging to any particular quadrant of this bidimensional knowledge matrix is more beneficial than belonging to another quadrant can be explored As well as the impact that being either closer to the center of the matrix, or alternatively farther away from the center of the matrix might have on the lives and wellbeing of individuals. Thus, the principle questions of this study are as follows:

1. *Are there statistically significant patterns for how individuals fall across a bidimensional knowledge matrix?*

2. *If so, can these patterns be used to predict the degree of success that an individual is likely to attain in life, in terms of income, education, career, and happiness?*

3. *Can identifying and understanding these patterns be used to help ease the animosity that currently exists between the political ideologies by creating increased understanding amongst them.*

Methods

Creation of A Bidimensional Knowledge Matrix

A key component of this study is the creation of a bidimensional knowledge matrix. With one axis representing knowledge seeking attitudes and the other representing knowledge chaperoning attitudes.
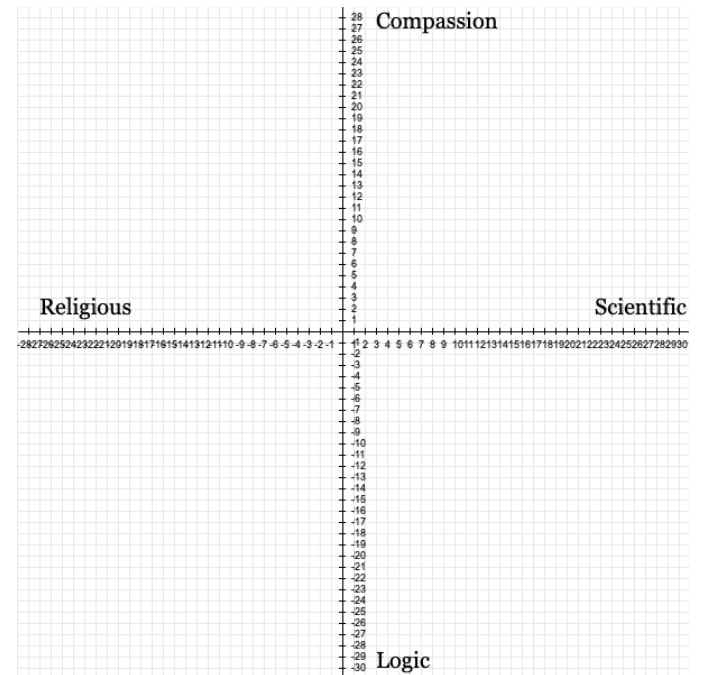
Either of the two principal continuums being tracked could have been selected to represent the x

or y axis of the matrix. Likewise either of the two poles for each continuum could have been assigned as positive or negative for these axes. Given that this is ultimately irrelevant to the results, the knowledge seeking continuum was assigned to the x axis. With "Religion" representing the negative side and "Scientific" representing the positive side. The knowledge chaperoning continuum was assigned to the y axis. With "Logic" representing the negative side, and "Compassion" representing the positive side.

Participants

Participants were sought through MTurk. Which has been shown to provide a reasonably representative sample of the American public. These participants were selected based on their geographic location, The United States, and their age, 18 or older. In order to ensure quality results, participants were required to have a 95% approval rating on MTurk and to have completed at least 100 HITs already. The survey was open to 800 HITs. However, only 526 participants completed it.

The Questionnaire

The questionnaire consisted of 120 questions, which were randomized prior to each administration so as to obscure the intent of what was being collected. Before randomization this survey consisted of four parts. The first 20 questions [Appendix I.] were designed to determine whether or not an individual actively seeks knowledge. These questions were presented to participants in the form of a Likert Scale, Where participants were asked to specify how strongly a given statement represented their views. The scale ranged from Strongly Agree (5), Agree (4), Neutral (3), Disagree (2), and Strongly Disagree (1). Ten of these questions were asked using positive phrasing, e.g. "I enjoy learning.", "I spend a portion of each

day pursuing knowledge.", and "When it comes to learning I am self motivated." While ten questions were asked using negative phrasing, e.g. "Learning new things does not interest me at this stage in my life.", "It is hard for me to motivate myself to learn new things.", and "I do not enjoy learning." The totals from the positively and negatively phrased questions were summed in order to provide a final score.

The second part of the questionnaire included 20 questions designed to measure whether or not an individual actively chaperones their knowledge. These questions followed the same pattern. With ten being positively phrased and ten being negatively phrased. They were also analyzed in the same way.

At this initial stage it was important to determine whether or not a participant actively sought and / or chaperoned their knowledge. If a participant did not actively engage in either knowledge seeking or knowledge chaperoning then there would be little value in attempting to classify where they fell when it comes to how they go about each of these activities.

The third part of the survey [Appendix I] consisted of 40 questions which were also presented to participants on a Likert scale. These questions were designed to classify how individuals seek knowledge and also how they chaperone their knowledge. These questions only applied to those individuals where the previous questions had indicated that they both actively sought and also actively chaperoned their knowledge. The first ten of these questions were designed to measure an individual's trust level for religion based sources. The next ten questions were designed to measure an individual's trust level for scientific sources. The

third set of ten questions were designed to measure an individual's inclination towards chaperoning their knowledge with logic, and the final ten questions were designed to measure an individual's inclination towards chaperoning their knowledge with compassion. The questions representing the knowledge seeking axis (subset 1 / religion, and subset 2 / Science) were compared to each other, and the questions representing the knowledge chaperoning axis (subset 3 / logic, and subset 4 / compassion) were also compared to each other. Because we assigned religion and logic as the negative x, y values in the bidimensional knowledge matrix, these were subtracted from the positive x, y scores for science and compassion. Which resulted in a final plottable x,y set of coordinates that could be graphed on the bidimensional knowledge matrix.

The fourth and final part of the survey consisted of 40 questions [Appendix I] that covered a variety of topics relating to demographics. Such as income levels, education levels, relationship success, self-reported happiness and so forth. The purpose of these questions was to look for any positive or negative correlations that might exist between where an individual graphs on the bidimensional knowledge matrix, and how these individuals fare in life.

Data Analysis

The following procedures were used to calculate and analyze the data that was collected.

Calculating Dimensionality.

Before an individual could be graphed on the bidimensional knowledge matrix it was necessary to first determine whether or not they actually perform in the area being measured. Charting someone's location in terms of whether

they seek knowledge more from religion or more from science would be meaningless if the individual doesn't actively seek any learning at all. Likewise, charing someone's location in terms of whether they chaperone their knowledge with compassion or with logic also would be meaningless if they don't chaperone their knowledge.[1]

To test for knowledge seeking and knowledge chaperoning, a score was generated for each participant based on how they responded to the survey questions for both knowledge seeking and knowledge chaperoning, as described earlier. If the score that resulted was positive then individuals were determined to be measurable to at least to some degree for that axis. If the score of an individual was negative for either axis, then they were said to be unidimensional. In that they could only be graphed on one axis but not the other. If the score of an individual was negative for both axes then the individual was said to be a "nonengager." Indicating that they neither actively sought knowledge nor chaperoned the knowledge that they did have.

Unidimensional participants were placed on their own graphs [Appendix IV] separate from those on the bidimensional knowledge matrix. Nonengers were not graphed at all.

Calculating Location On A Bidimensional Knowledge Matrix.

For those participants where it was demonstrated that they both actively sought and also actively chaperoned their knowledge it was necessary to further test them, in order to measure

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[1] It is important to distinguish between knowledge chaperoning and knowledge usage. Someone who does not chaperone their knowledge couldt still use that knowledge unchaperoned. Thus, it is not our purpose to look at the degree to which someone uses knowledge, but rather at the degree to which they chaperone it.

the degree to which they registered for each of these axes on the matrix so that they could be plotted on the graph.

It was assumed that the poles for either axis were not mutually exclusive. In other words, it was assumed that someone could be both highly inclined towards compassion and also highly inclined towards logic. Likewise, it was assumed that a person could show a high degree of trust for both science and also for religion. Thus an accurate score had to take this into account by reflecting not just the degree to which an individual registered for one of these extremes, but rather the degree to which they register for both.

To calculate a score for knowledge seeking (Religion vs Science) participants were asked a series of questions designed to measure their trust of both religion and science. With religion being assigned a negative value and science being assigned a positive value. Thus as an example, a person who scores (30+) for science and (20-) for religion would end up with a net knowledge seeking score of (10+). The same process was used to calculate the scores for knowledge chaperoning. The net knowledge seeking score was used to graph the participant's x position on the bidimensional knowledge matrix while the net knowledge chaperoning score was used to graph their y position.

Recognizing The Importance of Both Central Proximity And Degree.

An participant whose scores are equally balanced on either side of an axis will chart nearer to the center of that axis, regardless of the degree to which they register for the two extremes being measured. For example, someone who scores a (5-) for religious trust and a (5+) for scientific trust will have a net knowledge seeking score of (0). The same would be true of someone who scored a (50-) for religious trust and a (50+) for scientific trust. Yet these two individuals are clearly very different from one another. To account for this reality on the graph each of the dots representing individuals were divided into two parts. With the inner dot representing the knowledge seeking score, and the outer dot representing the knowledge chaperoning score. The larger each dot appears on the graph the higher their degree (raw scores) were on either side of the axis. Thus in the earlier example, the participant who has scores of (5-) and (5+) would show up on the graph with a very small dot, while the participant whose scores are (50+) and (50-) would show up with a much larger dot.

It was also necessary to account for this in the final analysis of the data so that meaningful inferences could be drawn. To do this it was necessary to calculate a **Central Proximity Ratio** that considers both proximity and degree. The process for calculating this ratio is described below.

Calculating The Central Proximity Ratio.

The central proximity ratio for a participant, is a score that takes into account both their location in terms of their distance from the center of the bidimensional knowledge matrix, as well as the degree to which their raw scores were either high or low. This ratio is calculated by dividing the individual's central proximity by the mean raw scores for all four (Religion, Science, Logic, Compassion) metrics being measured. Calculating an individual's central proximity requires simply determining how far from the center (0,0) point of the bidimensional knowledge matrix that a participant graphs.

This was accomplished using the following formula: Central Proximity$=\sqrt{((0-NKS)^2+(0-NKC)^2)}$ where NKS is the net knowledge seeking score and

NKC is the net knowledge chaperoning score. The mean raw scores for all four metrics was calculated as follows: (Science+|Spiritual|+Logic+|Compassion|)/4.

Lastly the Central Proximity Ratio was calculated as follows: CPR=CP/MRS. Where CP refers to Central Proximity and MRS refers to the mean raw scores for each metric. The result is a useful score that can be used in data analysis calculations. Thus, the lower a participant's CPR was, the greater that both their central proximity and their degree of diversity between both sides of an axis was.

Negative And Positive Correlations For Wellbeing.

The last thing that this study tracked was the wellbeing of participants in terms of education, career, income, happiness, relationships and so forth. The goal being to determine whether or not there was a correlation between where a person registered on this bidimensional knowledge matrix and how they fared in life. To that end the research focused on different areas of the matrix and calculations were performed to determine the mean income, happiness level, education level and so forth for those participants whose scores placed them in each region. This included looking at all four quadrants of the graph, as well as at central proximity vs distance from central proximity (discussed later in this article).

Limitations

While 526 respondents is a reasonable number of participants, when these are spread across multiple quadrants they become less and less significant. Especially when these are further subdivided between political ideologies and other measures. To account for this, the researcher was careful not to draw any conclusions where there simply was not enough data to justify inferences being drawn. Another limitation came from the fact that this is the first time this model has been conceived of or tested. As such, it was not possible to predict in advance which information would be relevant, and which would not. As a result, some of the survey questions were not sufficiently detailed, resulting in a potentially lower effect size as will be discussed later in this article. Additionally, there are undoubtedly issues relating to the internal reliability of the first 80 questions that were used to chart individuals on the bidimensional knowledge matrix. Efforts were made to carefully define the question parameters and to write questions that would remain true to these parameters. However, in future studies it would be helpful to review the questions used in this study for internal reliability and to adapt the questionnaire accordingly.

Results

This study included two separate sets of data. The first set which was collected through the first 80 questions of the questionnaire was designed to address the first research question:

Are there statistically significant patterns for how individuals fall across a bidimensional knowledge matrix?

The second set of data was derived from the final 40 questions of the questionnaire and was collected in order to answer the second research question:

If so, can these patterns be used to predict the degree of success that an individual is likely to attain in life, in terms of income, education, career, and happiness?

Bidimensional Knowledge Matrix, Raw Data

This table contains the raw data that was collected from 526 volunteers who responded to the survey via MTurk. This data has been ordered per the process described earlier in this article.

	All	Lib	Con	Cent
Nonengagers	3% (17)	2% (3)	4% (10)	4% (4)
Uncharoned Knowledge Seekers	13% (68)	7% (14)	18% (42)	13% (12)
Chaperoned Nonseekers of Knowledge	10% (55)	8% (15)	12% (28)	11% (10)
Quadrant A	3% (16)	1% (2)	4% (10)	3% (3)
Quadrant B	13% (67)	24% (44)	5% (12)	5% (5)
Quadrant C	3% (16)	1% (2)	5% (11)	2% (2)
Quadrant D	13% (66)	17% (32)	9% (20)	14% (13)
Central Proximity < 7	40% (210)	37% (70)	41% (94)	46% (42)
Central Proximity > 7	33% (174)	45% (85)	25% (57)	25% (23)

All: All Participants, Lib: Liberals, Con: Conservatives, Cent: Political Centrist

Nonengagers refer to those individuals who do not register for either knowledge seeking or knowledge chaperoning. Unchaperoned knowledge seekers refer to individuals who actively seek knowledge, but who do not chaperone their use of it. Chaperoned nonseekers of knowledge refer to individuals who do not actively seek learning, but who do chaperone the knowledge they have. Quadrants A-D refer to individuals whose scores place them in a specific part of the bidimensional knowledge matrix. (see fig. 1) A central proximity that is less than 7 refers to individuals whose scores place them within 7 degrees of center. (see fig. 2) A central proximity greater than seven refers to

individuals who are bidimensional but who fall outside of a central proximity of 7. It is worth noting that quadrants A-D contain individuals who fall both within and without a central proximity of 7.
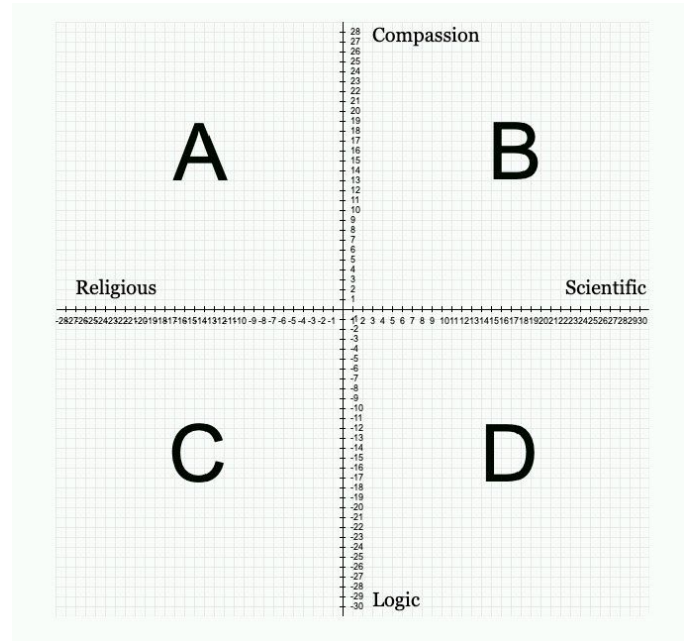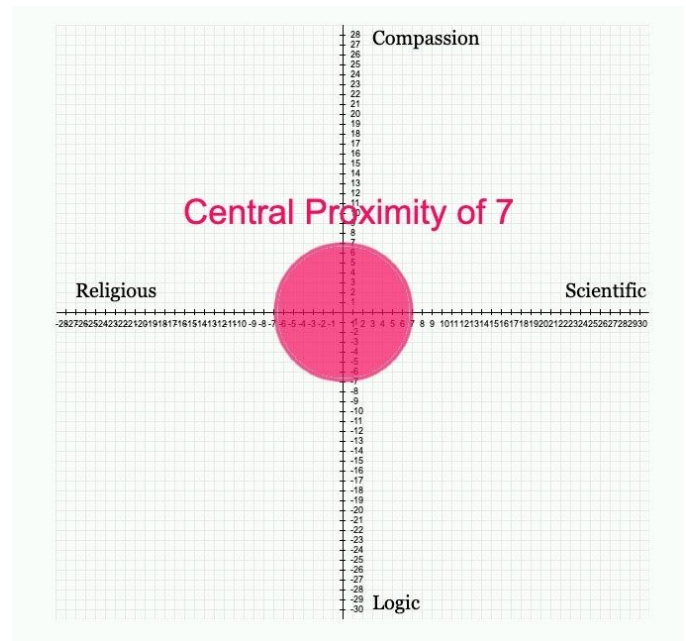

Fig. 1

Fig. 2

The following diagrams show how

participants charted on this bidimensional knowledge matrix. Note that the political ideology of participants was self-reported by the individuals.

Light and dark blue dots represent liberals, with light blue being those who self-reported as moderately liberal, and dark blue being those who self-reported as extremely liberal. Light and dark red dots represent conservatives. With light red being those who self-reported as moderately conservative and dark red representing those who self-reported as extremely conservative. Green dots represent individuals who self-reported as being political centrists. White dots represent participants who did not report their political affiliation.

Figure 3 shows the results of all 526 volunteers. Figure 4 shows the results of conservatives and liberals. Figure 5 shows the results of only liberals. Figure 6 shows the results of only conservatives. Figure 7 shows the results of graphing those who self-reported as being political centrists.

Again, as discussed earlier in this article each dot is divided into two parts. With an inner dot and an outer dot. The size of the inner dot is based on the degree to which a person scores highly on the religion vs scientific axis (x-axis). Those participants scoring a higher degree or score have a larger dot. The size of the outer dot is based on the degree to which a person scores highly on the compassion vs logic axis.
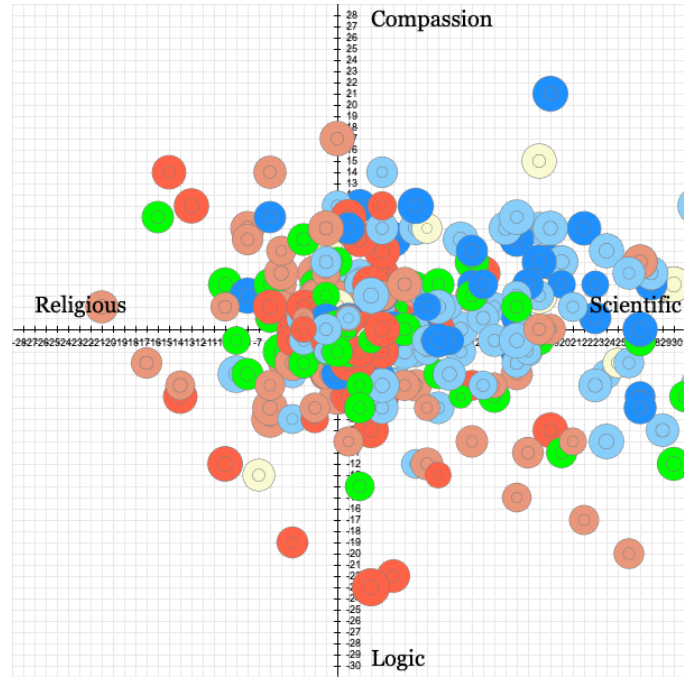
All Participants
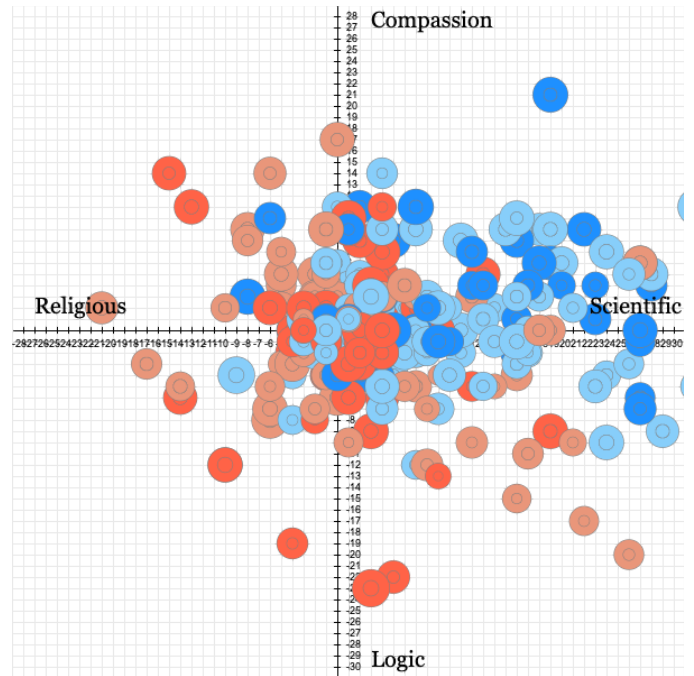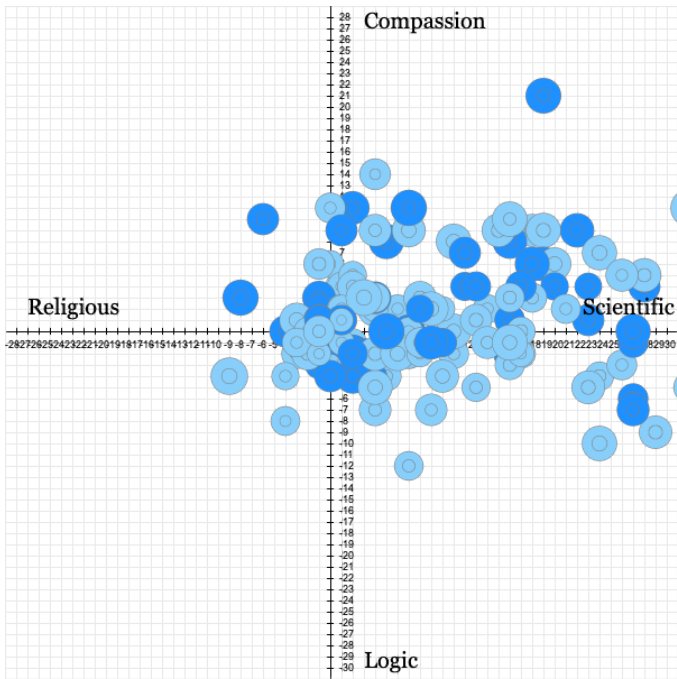

Fig. 3

Liberal vs Conservative

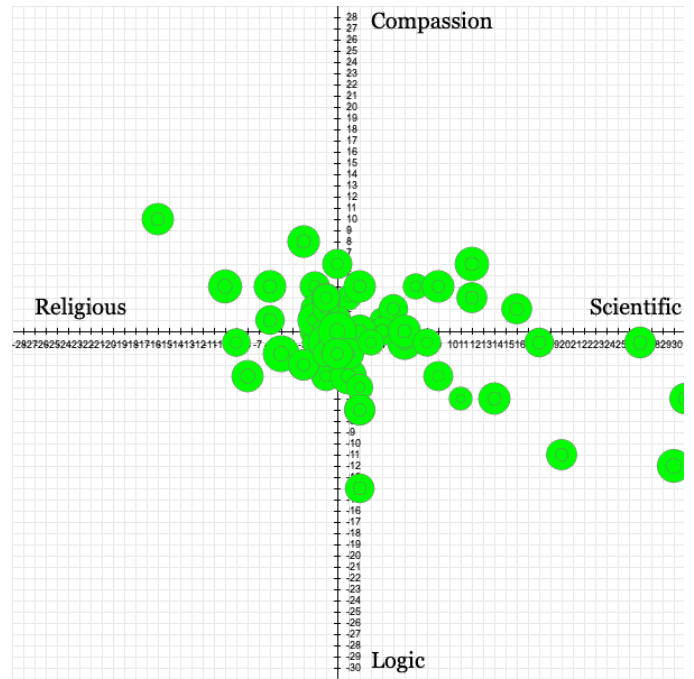
Fig 4.

All Liberals

Fig. 5
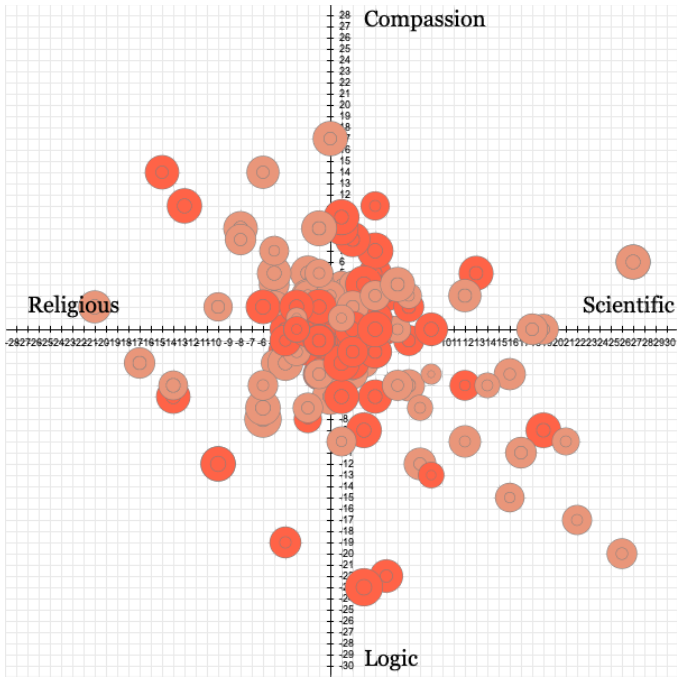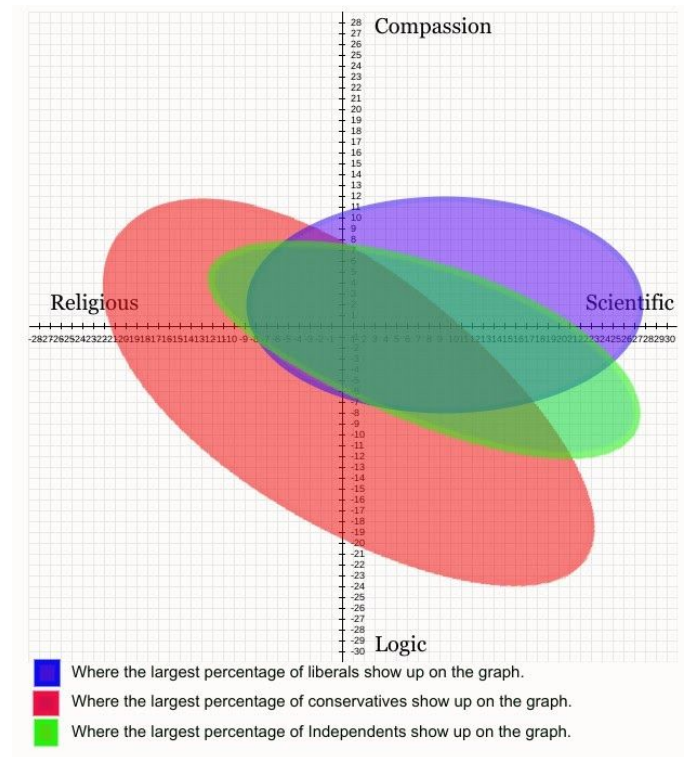

Fig. 7

All Conservatives

Common Patterns Observed

Fig. 6

All Political Centrists

Effect / Impact On Participants, Raw Data

As discussed earlier in this article the second part of this study was designed to explore whether or not the location of a participant on this bidimensionality knowledge matrix would show a positive correlation for various aspects of wellbeing, and if so, to what extent.

This table contains the raw data that was collected from the second half of the questionnaire.

	Income	Happiness	Education	Relationship status	Trust For The Other Party
All	$52.54K	3.175	15.49 Years	2.66	1.06
Quadrant A	$42K	3.142	16.14 Years	2.42	1.23
Quadrant B	$47.83K	3.045	15.4 Years	2.22	1.11
Quadrant C	$59.85K	3.5	14.42 Years	3.42	1.21
Quadrant D	$49.88K	2.98	15.15 Years	2.49	0.88
Central Proximity < 7	$55.63K	3.262	15.65 Years	2.82	1.1
Central Proximity < 7 CPR < 0.2	$55.08K SD (6.45) SS (161)	3.268 SD (1.0984) SS (161)	15.7 Years SD (1.74) SS (161)	2.83 SD (2.5) SS (161)	1.1 SD (0.936) SS (161)
Central Proximity > 7	$48.89K SD (6.52) SS (146)	3.075 SD (1.0191) SS (146)	15.31 Years SD (1.88) SS (146)	2.49 SD (2.52) SS (146)	1 SD (1.105) SS (146)
Effect Size	0.954497	0.182163	0.215309	0.135457	0.097657
Impact	11.20%	6%	2.50%	12.10%	9.10%

SD: Standard Deviation
SS: Sample Size
CPR: Central Proximity Ratio

The data for income, happiness, education, relationship status, and trust for the other party are self-reported and based on various classifications, which are all included in Appendix I. For each category a higher score denotes more success, while a lower score denotes less success.

The impact percentage reported for each category was calculated by contrasting the mean performance of participants with both a central proximity of less than 7, and a central proximity ratio of less than 0.2, against participants with a central proximity greater than 7.

The effect size for each category was calculated using Cohen's d formula (Cohen, 1992), and is based on the same comparison that was used to calculate the impact. While most of these effect sizes are small, it is important to account for the fact that these small effect sizes are very likely due to an error in the questionnaire which will be explained in the discussion section of this article.

Discussion

Research Question 1: Are there statistically significant patterns for how individuals fall across a bidimensional knowledge matrix?

There are two distinct trends in the data, which each support the disparate findings of previous researchers on opposing sides of the debate regarding whether or not ideology plays a role in political party affiliation. Those participants who fall within a central proximity of 7 are largely homogeneous in their views (40% of respondents). While those who fall outside of a central proximity of 7 are much more heterogeneous (60% of respondents).

The first group (CP<7) confirm the findings of past researchers who have found that ideology plays very little to no role in party affiliation. (Malka, A., Lelkes, Y., 2010)(Baldassari, D., & Gelman, A., 2008) While the second group (CP>7)

confirm the findings of researchers who have found that ideology has at least some degree of impact on party affiliation. (Carney, D. R., Jost, J. T., Gosling, S. D., & Potter, J. f, 2008) (Ashton, M. , Paunonen, S. , Helmes, E. , & Jackson, D., 1998)

For those participants who had a central proximity less than 7 there was virtually no distinct or recognizable pattern evident based on the political party that someone claims affiliation with. However, once we looked outside of this central proximity of 7 several patterns became apparent.

Liberals Occupy Quadrant B

One of the most interesting findings was that liberals who are outside of a central proximity of 7 tend to dominate Quadrant B. Which represents persons who seek knowledge from scientific sources, and who chaperone their knowledge with compassion.

Conservatives Occupy Quadrants A, C, D

Another interesting finding was how few conservatives occupied Quadrant B, amongst those with a central proximity greater than 7. Most conservatives outside this zone tended to chart in Quadrants A, C, and D. With the largest number graphing in Quadrant D. Which represents persons who seek knowledge from scientific sources and chaperone their knowledge with logic. A significant number also appeared in Quadrants A and C, which both seek knowledge from religious sources.

Centrists Occupy Quadrant D

Participants who self-reported as political centrists, also showed little variation within a central proximity of 7. Those who fell outside this zone mostly charted in quadrant D.

Examples of Extreme Deviation

In all cases (liberal, conservative, centrist) there were examples of individuals who self-reported as belonging to one political ideology but who then chartered very differently from the rest of the participants who shared their ideology. This was more common amongst conservatives, and much less so amongst liberals and centrists who each charted more consistently in the same region of the bidimensional knowledge matrix.

How was the research question answered?

The data suggests that there are very definite and predictable patterns to how individuals chart on a bidimensional knowledge matrix.

Research Question 2: If so, can these patterns be used to predict the degree of success that an individual is likely to attain in life, in terms of income, education, career, and happiness?

There were distinct characteristics that emerged in many of the quadrants relating to an individual's wellbeing. For example individuals in Quadrant A had the overall highest education rates, while those in Quadrant C reported the highest incomes, happiness levels, and relationship success. However, the most statistically significant results came from contrasting those with a central proximity of less than 7 and a central proximity ratio less than 0.2 against participants who had a central proximity greater than 7.

Central Proximity Less Than 7 / Central Proximity Ration Less Than 0.2

The participants who fell inside this zone had higher incomes, happiness levels, higher education levels, and were more trusting of the other political ideology than those who fell outside of this zone. Of particular interest is the effect size for income. Which was 0.95. Meaning that there is a strong positive correlation between being inside of this zone and earning a higher income.

Low Effect Size For Happiness, Education, Relationship Status, and Trust of The Other Party

The effect size for the other categories that were tracked by this study were very low. However, this is likely due to poor design of the questionnaire. When this study was conceived the researcher did not know what results might be significant. As such, some of the questions were too limited in scope. Not offering respondents enough degree of variation. For example, in the case of income, participants had the option to select between seven different levels or categories of income. However, in the case of happiness they only had the option to select between three levels. Thus with the degree of options artificially narrowed down to such a small scope, the standard deviation was magnified. Resulting in a lower effect size. It is possible that these effect sizes are accurate. However additional research needs to be completed to determine whether or not this is the case.

How was the research question answered?

The data shows that in the case of income, happiness, relationship status, education, and trust of the other party that there is an impact that results from having a central proximity less than 7. In the case of income the effect size is statistically significant. Further research needs to be completed

to further explore this question and to clarify the effect size of other categories, as well as to explore other categories of well being, and how they relate to an individual's location on a bidimensional knowledge matrix.

Research Question 3: Can identifying and understanding these patterns be used to help ease the animosity that currently exists between the various political ideologies by creating increased understanding amongst them.

This question was not directly addressed within this study. Additional research would be needed to say what impact the understanding of this model can have on helping to ease the general animosity that currently exists within the body politic.

However, this question was addressed indirectly, in that it shows how a person can benefit from having a lower central proximity.

It can be reasonably assumed that teaching the public to understand how those of the other political ideology think can lead to increased peace. For example, helping the public understand that the other political ideology might trust different sources of "truth" could help communicators better target and frame their arguments. Likewise, helping the public understand that the other political ideology might judge the correctness of a solution to a problem based on a different criteria, could help all sides to work together to come up with more pragmatic solutions.

Liberals often do not understand how it is that conservatives can get behind the solutions they do. Likewise, conservatives often cannot understand why liberals get behind the solutions that they do. This study provides a framework for

encouraging more understanding. By illustrating that it isn't that one side is right, and the other is wrong, but instead that both sides are judging the value of what is the correct solution based on different criteria. Those who chaperone their knowledge using logic will judge a different option to be more right than those who chaperone their knowledge with compassion.

Lastly, understanding this matrix can help illustrate how alike the two ideologies are, and how much they have in common.

It is recommended that additional research be done in order to explore how a bidimensional knowledge matrix can be used in course development, in cross political dialogue, in communication, such as writing, news reporting, and so forth. So that individuals from across the bidimensional knowledge matrix can be more adequately communicated with, and more effectively worked with to solve problems.

About The Author

Hiram Bertoch has an M.A. in Biology, and an M.Ed. in instructional design. He is the founder and former CEO of The KidsKnowIt Network, which until 2013 when it was sold, was one of the largest online education portals in the world. After retiring from business he became and is currently working as a sixth grade science teacher.

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Appendix I - Survey Questions

Questions To Determine A Person's Knowledge Dimensionality (Knowledge Seeking):

Question Parameters: These questions are not meant to test how strong an individual's cognitive abilities are. It is not an iq test. At this stage, the questions are also not intended to determine how a person seeks knowledge. All we are doing is asking whether or not they do seek knowledge.

Positive Likert Scale For Knowledge Seeking

1. I often read for the sake of learning.
2. I enjoy learning.
3. I regularly look things up that I don't understand.
4. I spend a portion of each day pursuing knowledge.
5. I make lists of things I want to learn about later.
6. My daily routine includes studying.
7. When it comes to learning I am self motivated.
8. It is important to me to understand how things work.
9. I am intelligent.
10. Knowledge is highly valued to me.

Negative Likert Scale For Knowledge Seeking

1. I often do not understand what others are saying.
2. I do not enjoy learning.
3. My current level of knowledge is sufficient to get me through the rest of my life.
4. I am too busy to spend time studying.
5. It doesn't bother me when people talk about things that I don't understand.
6. It is hard for me to motivate myself to learn new things.
7. I am not very smart.
8. I spend very little time studying, reading, or learning.
9. I only study when I have to.
10. Learning new things does not interest me at this stage in my life.

Questions To Determine A Person's Knowledge Dimensionality (Knowledge Chaperoning):

Question Parameters: These questions are not meant to test how strong an individual's cognitive abilities are. It is not an iq test. At this stage, the questions are also not intended to determine how a person chaperones their knowledge. All we are doing is asking whether or not they do chaperone their knowledge.

Positive Likert Scale For Chaperoned Knowledge Using

1. It is important to be true to your own values.
2. My values matter more to me than my success.
3. Taking shortcuts is usually a bad idea.
4. I follow the advice I give to others.
5. I am consistent, even when others are not watching.
6. When pressed, I stand by my reasons for a decision.
7. I can usually articulate my reasons for a decision.
8. I am consistent.
9. I don't mind acting in ways that might make me unpopular.
10. Popularity is less important than being true to myself.

Negative Likert Scale For Chaperoned Knowledge Using

1. Creating change is more important to me than how I accomplish that change.
2. Sometimes you have to tell white lies in order to motivate people.
3. Taking shortcuts is okay if it yields the results I want.
4. I frequently do things that I tell others not to do.
5. I can easily fool other people.
6. I can read others and am good at manipulating them.
7. It is okay to be inconsistent if it leads to the outcomes I am seeking.
8. I often follow the crowd and feel uncomfortable going against what the group

values.
9. Popularity is very important to me.
10. The opinions of others about myself, greatly influence my decisions.

Questions to determine an individual's tendency towards knowledge seeking.

Question Parameters: These questions are not meant to test how strong an individual's cognitive abilities are. It is not an iq test. All we are doing is asking the degree to which the participant trusts science, and the degree to which they trust religion. Questions should be written in such a way so as to not be mutually exclusive. Ie, allowing someone to score highly for both science and religion.

Likert scale for identifying how much the participant trusts scientific sources of truth. (positive values).

1. I read scientific studies, journals, or articles.
2. I trust scientific sources.
3. Fully understanding the Universe requires doing scientific research.
4. I have a high level of scientific knowledge.
5. Science will eventually help solve most of the problems that the world faces.
6. It is important to listen to the advice of qualified experts.
7. Scientists are a good source of dependable information.
8. Experts are usually trustworthy.
9. Scientific research is usually unbiased.
10. Science has helped me learn a great deal about the world around me.

Likert scale for identifying how much they trust religious sources of truth. (negative values)

1. I believe in a power greater than what can be understood by science alone.
2. I have learned great truths from spiritual leaders, either past or present.
3. I have a priest, rabbi, or other spiritual leader who I trust.
4. I have found truth through meditation.

5. I meditate, ponder, or pray on a regular basis.
6. Understanding the Universe requires faith.
7. Valuable knowledge and important truths can be found in the teachings of spiritual leaders.
8. I do not need to see something to believe it.
9. I believe in a supreme being.
10. I believe there is more to existence than just this life.

Questions to determine an individual's tendency towards chaperoned knowledge usage.

Question Parameters: These questions are not meant to test how strong an individual's cognitive abilities are. It is not an iq test. All we are doing is asking the degree to which the individual chaperones their knowledge with either compassion, logic, or both. Questions should be written in such a way so as to not be mutually exclusive. Ie, allowing someone to score highly for both compassion and logic.

Likert scale for identifying the degree to which a participant chaperons their knowledge with compassion. (positive values)

1. I often provide others with a shoulder to cry on.
2. I experience sympathetic emotions on behalf of others.
3. I have been told that I am a good listener.
4. Empathy towards others is important.
5. I can usually tell what other people are feeling.
6. It matters to me that other people feel validated and important.
7. It is hard for me to see suffering.
8. When I see suffering, I feel obligated to help.
9. The best solutions to a problem account for how it will impact other people.
10. I put the health and emotions of others above economic concerns.

Likert scale for identifying the degree to which a participant chaperons their knowledge with logic. (negative values)

1. Logic can be used to unravel most problems and find solutions.
2. A good solution to a problem should always be built on logic.
3. Logic is absolute.
4. Truth is absolute.
5. I expect others to back up their opinions with facts and evidence.
6. Facts don't care about your feelings.
7. I am good at balancing a bank account.
8. Good arguments are built on logic, math, and commonsense.
9. All problems can be solved using common sense.
10. Opinions are meaningless unless supported by facts.

Demographic questions. These questions are used to test whether there is a correlation between success in a particular demographic, being in any particular part of the bidimensional knowledge matrix.

Question Parameters: These questions should probe into the demographics of the participants.

Note: In the original survey 40 questions relating to demographics were asked. However, most of them proved to be meaningless or showed no correlation. Only the questions that showed a positive correlation are shared below. The rest were discarded.

---

1. Are you in a long-term relationship?
    a. I am not in a long-term committed relationship.
    b. I am unmarried, but in a committed long-term relationship lasting longer than 1 year.
    c. I am unmarried, but in a committed long-term relationship lasting longer than 5 years.
    d. I am married.

How question 1 was quantized:
Each category was assigned a value as follows:
A:1, B:2, C:3, D4

2. Are you happy?
    a. I am usually very happy
    b. I am mostly happy
    c. I am mostly unhappy
    d. I am usually very unhappy

How question 2 was quantized:
Each category was assigned a value as follows:
A:4, B:3, C:2, D1

3. What is your annual income? Not including the income of a spouse, partner, etc.
    a. Less than $25,000 per year
    b. Between $25,000 and $40,000 per year
    c. Between $41,000 and $60,000 per year
    d. Between $61,000 and $90,000 per year
    e. Between $91,000 and $120,000
    f. Between $121,000 and $250,000 per year
    g. More than $250,000

How question 3 was quantized:
Each category was assigned a value as follows:
The value of the mean for each category was used. Thus, if a person selected C, the value entered was $50,500. For A the value entered was $25,000. For G the value entered was $250,000.

4. What is your education level?
    a. I am a high school dropout
    b. I Graduated From High School
    c. I attended some college but did not graduate.
    d. I have a bachelor's degree.
    e. I have a masters degree.
    f. I have more than one master's degree, or I have a terminal degree.

How question 4 was quantized:
Each category was assigned a value as follows:
A:10, B:12, C:14, D:16, E:18, F: 20

5. Which of the following best describes you?
    a. I respect the views of people who belong to the opposite political party from myself.
    b. I have a hard time respecting the views of people who belong to the opposite political party from myself.
6. Which of the following best describes you?
    a. People in the opposite political party are often misguided, and sometimes dangerous.
    b. People in the opposite political party are mostly well meaning, and thoughtful.

How questions 5 and 6 were quantized:
These both addressed the same category, which is the participants trust level of the opposite party. These questions were combined according to the following Formula:

5.a + 6.b = 2 points
5.a + 6.a = 1 point
5.b + 6.b = 1 point
5.b + 6.a = 0 points

Appendix II - Informed Consent

Informed Consent

You are being invited to participate in a web-based online survey which will be used to test a theory regarding how knowledge seeking and chaperoning behaviors impact individuals. This is a research project being conducted by Hiram Bertoch.

PARTICIPATION
Your participation in this survey is voluntary. You may refuse to take part in the research or exit the survey at any time without penalty. You are free to decline to answer any question you do not wish to answer for any reason.

BENEFITS
You will receive no direct benefits from participating in this research study. However, your responses may help the researcher learn more about how individuals use knowledge.

RISKS

The possible risks or discomforts of the study are minimal. You may feel a little uncomfortable/embarrassed answering sensitive survey questions. You are not required to answer any questions that make your uncomfortable.

CONFIDENTIALITY
Your survey answers will be sent to a link on Google Forms where the data will be stored in a password protected electronic format. This Google Form is set to not collect identifying information such as your name, email address, or IP address. Therefore, your responses will remain anonymous. No one will be able to identify you or your answers, and no one will know whether or not you participated in the study.

CONTACT
If you have questions at any time about the study or the procedures, you may contact my researcher using the email address below. You are entitled to a copy of the results. If you would like a copy sent to you, please use this email address to request it.
(email Redacted from this appendix)

ELECTRONIC CONSENT: Please select your choice below.
Checking the "Agree" box indicates that

You have read the above information
You voluntarily agree to participate
You are 18 years of age or older

Appendix III - Debriefing / Dehoaxing

Thank you for your participation in this questionnaire. This survey will help the research to better understand how people seek out learning opportunities and how they then apply their knowledge to solve problems. It will also help the researcher determine how the seeking and use of knowledge impacts an individual throughout their lives, and how this correlates across political ideologies.

You have a right to have your information removed from the survey. If you would like your information removed, please enter your MTurk worker ID below, and the researcher will irrevocably delete the information from the database.

Appendix IV - Additional Graphs

Graphs Not Shared In The Body of The Report

       The following graphs show the results for how the study participants who were unidimensional were scored. These were not included in the main body of the study because the sample size is too small to draw any meaningful inferences from them.

Unidimensional Graphs For Liberals
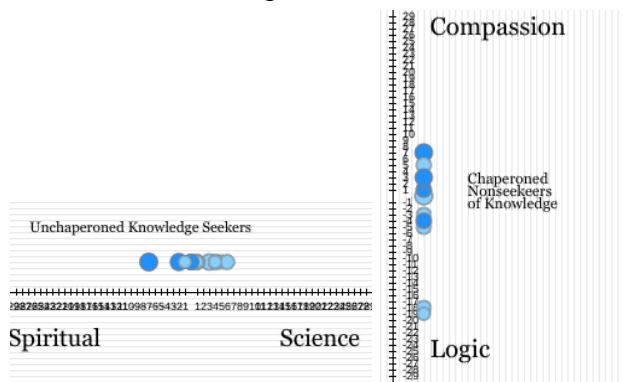
Unidimensional Graphs For Political Centrists
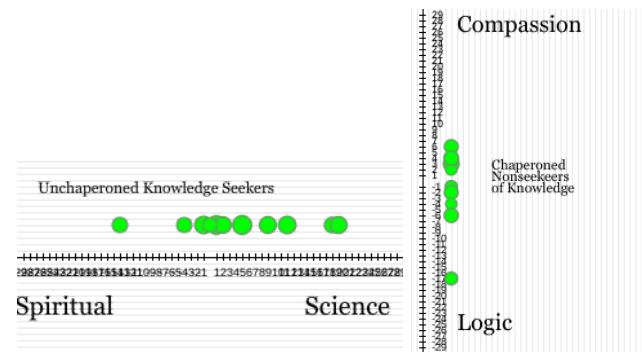
Unidimensional Graphs For Conservatives