# Second-Order Structure of Academic and Religious Personal Epistemologies

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***Abstract.*** *It was the aim of this research to examine how subjective viewpoints toward the source, certainty, and justification of knowledge, known as a personal epistemology (PE), combine across learning in school and knowing about religion. Q methodology was used as a means to examine the higher-order structure of the results of two PE studies conducted with the same Q set, one in academic learning and another in religious personal epistemologies. Results indicate that not only are academic and religious personal epistemologies interrelated, but these viewpoints may be described by three higher-order perspectives, named Doubtful Knower, Truth Seeker, and Personal Truth. The Doubtful Knower is suspicious about the existence of an accessible truth and sees no criterion by which conflicting opinions may be evaluated. The Truth Seeker sees the process of knowing as uncertain, and it is this element of uncertainty that compels them to search for the truth. Personal Truth believes that truth is idiosyncratic and personal to individual knowing. These higher-order PE perspectives suggest that PE exists at both a domain-specific and general level. The study further demonstrates that Q methodology is an appropriate framework for illuminating the tacit nature of PE while subsequently avoiding the methodological and psychometric challenges faced by other research methods.*

## Introduction

Personally held beliefs toward the nature of knowledge and knowing, referred to as one's *personal epistemology* (PE) (Hofer & Pintrich, 2002), have stimulated much research and controversy among psychologists and educational researchers. For example, it is questionable whether PE is best represented as *beliefs* at all, because some researchers suggest that PE is rather considered to be underlying assumptions (Baxter Magolda, 1992; King & Kitchener, 2004) that are tacitly held rather than explicit in conscious awareness (Limon, 2006). Yet, some commonalities may be found among recent models of PE (Bendixen & Rule, 2004; Buehl & Alexander, 2006; Hofer & Pintrich, 1997; Muis, Bendixen, & Haerle,

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2006). As Hofer (2006a) indicates, many researchers agree that PE is multilayered, multidimensional, and that over time these beliefs become increasingly differentiated, moving from domain-general beliefs to more domain-specific beliefs. PE is multilayered in that it is immersed within larger educational and sociocultural contexts; it is multidimensional in that it is composed of beliefs about the structure, certainty, (i.e. ontological beliefs; see Greene, Azevedo, & Torney-Purta, 2008), and source of knowledge. PE researchers emphasize how individuals justify knowledge claims, as this dimension is traditionally stressed among philosophers as a key component for establishing a theory of knowledge (Chisholm, 1989). Finally, though many researchers agree that individual beliefs about knowledge and knowing exist at both a domain-general and domain-specific level (Hofer, 2006b), numerous questions remain about how these levels potentially intersect, particularly intrasubjectively.

The rationale for this study depends on a clarification of what is meant by general and domain-specific PE. Muis et al. (2006) state that a domain of knowledge is a "body of knowledge that individuals possess about a specific field of study" (p. 10). General PE is then defined as "beliefs about knowledge and knowing that develop in nonacademic contexts such as the home environment, in interactions with peers, in work related environments, and in any other nonacademic environments" (p. 33). This general PE begins at birth and with the onset of formal education emerges a sub-domain labeled *academic knowledge* (p. 35). Over time academic knowledge becomes increasingly differentiated into beliefs about knowledge and knowing concerning particular disciplines (e.g. mathematics). In other words, according to the theoretical model of PE provided by Muis and colleagues, academic knowledge may be subdivided into particular disciplines while all other domains of knowledge are subsumed into the general domain. Though we believe that academic knowledge may be further differentiated into distinct disciplines, we agree with Hofer (2006a) that the model postulated by Muis et al. may overemphasize academic knowledge and subsequently neglect other important domains of knowledge and knowing. Hofer (2006b) called for an extension of PE research beyond the academic realm articulating other aspects of general PE, as academia is but one domain in which PE may have relevance (Limon, 2006).

The topic of religion may fall beyond the scope of philosophical epistemology (Greene et al., 2008). However, we argue that within the minds of many individuals, religious claims have the status of *knowledge* (or the belief that such knowledge is impossible). Subsequently, we suggest that many individuals hold either implicit or explicit beliefs about the nature and justification of religious knowledge. And after all, it is individual minds which ultimately concern us as we are not motivated,

as philosophers are, to construct a *theory of knowledge* as such. Moreover, empirical evidence indicates that PE is important within the psychology of religion (Desimpalaere, Sulas, Duriez, & Hutsebaut, 1999; Gottlieb, 2007; Hathcoat & Barnes, 2010; Hathcoat & Montgomery, 2009; Montgomery, Sandburg, & Zimmerman, 2005). Provided that PE is relevant to the religious domain, it is important to note that this domain differs from the definitions provided by Muis et al. (2006). These authors emphasized academic contexts with their definition of domain by defining a domain of knowledge as a field of study. Religion can be a field of study. However, we believe that religion is a domain of knowledge and knowing that is more encompassing than a specific field of study and that it is relevant to most people who have no formal, advanced academic study of religion. In the view of Muis et al., religious PE would be categorized as *general* PE, and it seems that labeling all other beliefs about knowledge and knowing that fall outside academia as general PE is far too broad. It is therefore our contention that what Muis and colleagues label as general PE may be further differentiated to include religious PE. Similar to academic knowledge, the religious domain is conceptualized as a sub-domain of a more general PE and therefore defined as beliefs about the source, certainty, and justification of religious claims to knowledge.

Questions remain about how different domains of knowledge and knowing intersect, though many theoretical models of PE agree that such an intersection exists (Buehl & Alexander, 2006; Muis et al., 2006). In other words, how does one's epistemology in academics interact with domains outside of academia? Hofer (2006a) affirms such a need when stating, "the generally accepted resolution that epistemic beliefs do exist at both the domain-general and domain-specific level makes it critical to begin to understand how these beliefs operate in relation to one another" (p. 91). Despite these suggestions, no known work has examined how academic PE may intersect with other domains of knowledge and knowing outside of academia. It is the aim of this research to heed this challenge by exploring the relationship among academic and religious PE. Moreover, we examine whether these relationships may be related to higher order perspectives thereby providing some evidence to the theoretical nature of general PE. These aims are accomplished by conducting a second-order principal components analysis on the results of two Q studies conducted with the same Q set. Different perspectives towards knowledge and knowing were previously identified in academic (Hathcoat & Montgomery, 2009b) and religious (Hathcoat & Montgomery, 2009a) domains and used as data for this study.

## The Utilization of Q Methodology in the Investigation of PE across Domains

Research on the domain-specificity of PE is reviewed elsewhere (see Beuhl & Alexander, 2006; Muis, 2004; Muis et al., 2006). However, a brief description of the implications of these findings along with some of the current issues facing researchers investigating this problem is presented here. Researchers agree that PE exists at both a domain-general and domain-specific level. However, despite this level of agreement, researchers have identified numerous problems to better understand the structure of PE across domains (Beuhl & Alexander, 2006; Hofer, 2006a, 2006b; Limon, 2006; Muis et al., 2006). Findings are typically limited to educational contexts and generally indicate that students across academic disciplines espouse different epistemological beliefs. Furthermore, "studies which say that personal epistemology is general or both general and domain specific report modest correlations on similar dimensions across domains" (Muis et al., 2006, p. 20). In other words, if a student assumes that knowledge is certain within mathematics they are likely to declare that knowledge is certain in physics. Though it is believed that the existence of such relationships indicates that PE interacts across domains (Buehl & Alexander, 2006), conceptual and methodological problems limit the inferences researchers may make when examining the domain specificity of PE (Limon, 2006).

As discussed by Limon (2006), researchers utilize different theoretical frameworks for conceptualizing PE, which makes it difficult, if not logically impossible, to generalize findings across these studies. For example, researchers investigating PE from a developmental perspective (King & Kitchener, 2004; Kuhn, 2001) tend to examine *enacted* PE (Limon, 2006) as these researchers usually assess this construct by examining how individuals reason about ill-structured problems. Whereas researchers interested in the structure of PE (Schommer, 1990) tend to utilize self-report data from questionnaires. Responses to these questionnaires assess one's *professed* PE (Limon, 2006). Provided that PE is more tacit rather than explicit (Limon, 2006; Buehl & Alexander, 2006), the adequacy of these techniques for elucidating PE remains unclear. In other words, how should we illuminate that which is typically implicit?

Another pervasive challenge in PE research is that PE is thought to be extremely difficult to reliably measure via self-report data (Clarebout, Elen, Luyten, & Bamps, 2001; DeBacker, Crowsen, Beesley, Thoma, & Hestevold, 2008). These findings typically concern Schommer's (1990) epistemological questionnaire, and similar questionnaires (Schraw, Bendixen, & Dunkle, 2002) designed to measure general PE as a set of

five more or less independent dimensions. R-technique consistently demonstrates that the hypothesized factor structure fails to consistently replicate across independent samples, and items theoretically contrived to be unidimensional are at best only slightly inter-correlated (Clarebout et al., 2001; DeBacker et al., 2008). If one accepts the traditional view that reliability provides a constraint on validity coefficients, these findings lead to serious concerns.

## Method

Investigations of the domain-specificity of PE are limited by the poor psychometric qualities associated with quantitative scale development. Items on the scales in questionnaires are designed to assess general PE. However, researchers use these general measures to assess domain-specific beliefs by requiring the respondent to keep a particular domain in mind (e.g. psychology). Muis et al. (2006) question the legitimacy of the adaptation of the psychometric scales from general to domain-specific. The nonsensical use of the items and scales is readily apparent. For example, items validated as reliable on a general PE scale are "I don't like movies that don't have an ending," and "People who challenge authority are overconfident." Transforming the general PE scale to domain-specific, such as psychology learning reveals the challenges that the mere adaptation presents. These scale items particularly demonstrate the conflicting reference points as some items refer to the individuals' viewpoints; whereas, other items ask the participant to judge the viewpoint of others. Hofer (2006b) has called for items to be sensitive to the content area they are attempting to measure, and we believe that Q methodology allows for such sensitivity while concurrently addresses the concern of multiple reference points. Although findings among researchers investigating the development of PE tend to be consistent, Limon (2006) has stated that the assessment techniques used by these researchers are more apt to capture broad developmental trajectories rather than subtle differences across content domains. The results from Q methodology allow the benefit of the consistently emergent perspectives found in developmental literature while remaining sensitive enough to accommodate subjective differences in PE across domains to emerge. For example, instead of using existing PE questionnaires as a means to represent the concourse, statements from interviews previously published by developmental researchers may be systematically gathered. The same statements may then have sensitivity across content domains in Q methodology by altering the condition of instruction (e.g. by asking participants to think about learning and then religion).

Recognizing the advantages of Q methodology, other studies have been conducted to study PE. Ramlo and colleagues (2006; 2007) have

presented research papers wherein Schommer's (1990; 1994) embedded systemic model was used as a guiding theoretical framework. Ramlo and colleagues initially employed Schommer's (1990) epistemological questionnaire (EQ) as the Q set and found one dominant factor. Their later work (2007), wherein they slightly altered this Q set, found that instructors' views about ideal students were relatively similar across different domains of knowledge. This work is important for highlighting the benefits of Q methodology for understanding how students' views about knowledge and learning change over time. Other work employing adaptations from Schommer's questionnaire has found unique perspectives towards knowledge and learning that may have implications for teaching accounting (Flint & Montgomery, 2006). Though we commend these studies for advancing understanding of PE with this methodology, concerns about how the concourse was sampled across these studies remain. Schommer's choice to incorporate beliefs about learning as part of the definition of PE has stimulated much controversy (Pintrich, 2002). Researchers have argued for greater clarity in the conceptualization of this construct by arguing that beliefs about learning are not representative of the content domain of PE (Greene et al., 2008; Hofer & Pintrich, 1997). Beliefs about learning may be related to PE, but it is misleading to consider these beliefs as epistemological in nature (Pintrich, 2002). We share these concerns and suspect that incorporating beliefs about learning as part of the concourse may actually confound, rather than elucidate, PE perspectives. The scope of PE is better characterized as beliefs about the source, certainty, and justification of knowledge (Hofer & Pintrich, 1997), which was the conceptual range that guided the development of the Q set in the present study.

The purpose of the study reported here was to examine the domain-specificity and generality of PE perspectives by examining the intersection of PE across academic learning and religion. A second-order principal components analysis was conducted on these perspectives in order to investigate the multi-level nature of PE thereby revealing the general nature of these domain-specific perspectives.

## Q Set

The Q set designed and used for both studies can be found in the Appendix. The structure for sampling the concourse for the Q set was the developmental perspective for understanding PE (Baxter Magolda, 1992; Belenky, Clinchy, Goldberger, & Tarule, 1986; King & Kitchener, 1994; Perry, 1970). The developmental approach portrays a consistent picture of how PE progresses (Kuhn & Weinstock, 2002). Utilizing the language of Kuhn and Weinstock (2002), adults progress from an Absolutist perspective, toward a Multiplicity perspective, and finally to

an Evaluativist perspective. Absolutists believe in factual, certain knowledge and they tend to justify their claims to knowledge by referencing authority. The perspective of Multiplicity is denoted by the view that knowledge is uncertain and due to this uncertainty all opinions are presumed to be equally valid. Evaluativists see knowledge as uncertain. Yet despite this uncertainty, they form tentative conclusions through the synthesis of evidence. As indicated by Table 1, in previous research (Hathcoat & Montgomery, 2009a; 2009b), the Q set was structured by balancing statements referencing the certainty of knowledge, the justification of knowledge, and expert disagreement against an Absolutist, Multiplicity, or Evaluativist perspective. Statements referencing expert disagreement are included since these beliefs are important for understanding the source of knowledge (King & Kitchener, 1994; Perry, 1970). We adapted statements from previously published interviews (Baxter Magolda, 2004; Belenky et al., 1985; 1986; King, 2000; King & Kitchener, 1994; 2004; Perry, 1970) to gain 26 items.

***Table 1: Q Set 3 x 3 Factorial Design***

| | ***Absolutist*** | ***Multiplicity*** | ***Evaluativist*** |
|---|---|---|---|
| ***View of Knowledge*** | (5) | (5) | (5) |
| ***Justification of Knowledge*** | (5) | (5) | (5) |
| ***Expert Disagreement*** | (2) | (2) | (2) |

*Note: Numbers within parentheses indicate the number of statements selected to represent each cell of the factorial design.*

Six statements referencing expert disagreements were adapted from the *Reasoning about Current Issues Test* (Kitchener, King, & Wood, 2000). Due to challenges locating ample Evaluativist statements, three statements were constructed to fulfill the theoretical structure (statements 12, 22, and 26; see Appendix).

**Data for Second-Order Analysis**

The data for the present study consist of the results of the two studies (Hathcoat & Montgomery, 2009a; 2009b) with the same 30 participants. Three factor arrays were interpreted from each of the two studies. Therefore, for the present investigation, six perspectives served as the data to be analyzed. Hathcoat and Montgomery (2009b) identified three perspectives towards knowledge and knowing in the context of academics named as: *Contextual Evidentialist, Relativist,* and *I-Know*. The *Contextual Evidentialist* believes that within the realm of academia 'right' answers exist although what constitutes 'right' is contextual, in need of evidential support, and open to re-evaluation. The *Relativist,* however, is skeptical regarding the existence of truth and sees one's own consciousness as playing an active role in creating that which is

presumably knowable. This perspective therefore believes that "everything is relative," thereby leading to a view of the knowing process as being permeated with uncertainty. Unlike the *Relativist*, the *I-Know* perspective not only believes that certain knowledge is possible in academia, they believe that they have attained such truth. This perspective sees knowing as personal and they see their prior views as an authoritative criterion to evaluate new knowledge claims. Though opinions may have degrees of correctness associated with them, no one can label their opinions as erroneous.

Hathcoat and Montgomery (2009a) then reports the results from a study in which the same subjects were asked to complete a second sorting procedure in which they were asked to think of *how they know about religion*. Three perspectives emerged and were named as: *Confident Knower*, *Private Knower*, and *Tentative Knower*. The *Confident Knower* believes in an accessible and absolute religious truth. When faced with uncertainty, this perspective utilizes prior views as a means to evaluate the truth of new religious claims. The *Private Knower* however, sees religious knowing as a personal matter thereby believing that all opinions are equally valid. The *Private Knower* uses prior views to evaluate new religious claims, but sees religious truth as personal and individually determined. The *Tentative Knower* displays much skepticism regarding the existence of religious truth, but despite this skepticism sees a need to form provisional conclusions about religious claims to knowledge. Though religious knowledge may never be definitely known, not all opinions are viewed as equally valid.

## Results

We believe it is necessary to discuss our initial hypotheses, seduced as we were by the theoretical similarities of the two sets of results. When an analysis of all 60 sorts was conducted, a three-factor solution was evident leading to the ways that we thought a second-order analysis could result. Yet, true to the abductive approach of Q methodology, it was necessary to examine the second-order analysis with a fresh look. Before undertaking the second-order principal components analysis, we made the following predictions: (a) *I-Know* perspective would be positively and significantly related to the *Confident Knower*, (b) the *Relativist* would be positively related to the *Private Knower*, and (c) the *Contextual Evidentialist* would be positively related to the *Tentative Knower*. These predictions seemed obvious for numerous reasons. First, the *I-Know* perspective and the *Confident Knower* both believe in the existence of truth, and both are assured that they have the truth. Second, the *Relativist* and *Private Knower* both see truth as uncertain and personal. Finally, both the *Contextual Evidentialist* and *Tentative Knower* believe knowledge to be uncertain thereby believing that our

decisions about the truth-value of claims are contextual and provisional. Interestingly, these predictions failed to materialize. The second-order analysis confronted our theoretical innocence and examining the rationale behind this has been challenging, yet insightful.

**Correlations and Factor Structure**

The correlations among the six perspectives are provided in Table 2. It is interesting to note that the *Contextual Evidentialist* is indeed positively associated with the *Tentative Knower* ($r = 0.42$); however, this was not the strongest correlation for the tentative knower as this perspective is more strongly associated with the relativist ($r = 0.51$). Contrary to our expectations, there was no correlation among the *I-Know* and *Confident Knower* ($r = -0.02$). The *I-Know* perspective was most strongly related to the *Private Knower* ($r = 0.39$). Interestingly, the strongest association for the *Confident Knower* was with the *Relativist*, and this was in an expected negative direction ($r = -0.39$). The pattern of correlations would lead one to suspect that the *Contextual Evidentialist* would be significantly related to the *Convinced Knower*, the *Relativist* would load highly with the *Tentative Knower*, and the *I-Know* perspective would load highly with the *Private Knower*.

***Table 2: Correlation Matrix of First-Order Perspectives***

| | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|
| **1. *Contextual Evidentialist (A)*** | 0.05 | -0.12 | 0.26 | 0.28 | 0.42 |
| **2. *Relativist (A)*** | – | 0.07 | -0.39 | 0.13 | 0.51 |
| **3. *"I Know" (A)*** | – | – | -0.02 | 0.39 | 0.19 |
| **4. *Convinced Knower (R)*** | – | – | – | 0.07 | -0.08 |
| **5. *Private Knower (R)*** | – | – | – | – | 0.13 |
| **6. *Tentative Knower (R)*** | – | – | – | – | – |

*Note: A = academic personal epistemology; R = religious personal epistemology perspective.*

A principal components analysis was performed on the correlation matrix followed by a series of manual rotations. Using evidence from the unrotated factor matrix (such as eigenvalues: 1.8881, 1.4728, 1.2292, and 0.6795) for the first four factors, a decision was made to rotate the larger three factors first. A series of rotations was performed for each possible combination of factors in an effort to find simple structure. After each rotation the rotated factor matrix was examined in order to identify confounded perspectives. The final rotations include: A and B rotated -39º, A and C rotated -5º, and B and C rotated -31º. The final rotated factor matrix is provided in Table 3. This Table indicates how the rotations captured all six of the previously identified epistemological perspectives, and thereby accounting for 77 percent of the total variance. The loadings range from .72 to .84 indicating that the shared variance of each perspective with the perspective of their respective

***Table 3: Second-Order Factor Matrix and Correlations among Factors***

| | *Factors* | | |
|---|---|---|---|
| ***Perspective*** | ***A*** | ***B*** | ***C*** |
| ***Contextual Evidentialist (A)*** | 39 | **82** | -02 |
| ***Relativist (A)*** | **82** | -27 | -17 |
| ***"I Know" (A)*** | 22 | -26 | **82** |
| ***Convinced Knower (R)*** | -28 | **72** | 23 |
| ***Private Knower (R)*** | 32 | 19 | **74** |
| ***Tentative Knower (R)*** | **84** | 24 | -04 |
| ***% Variance Explained*** | *31* | *24* | *22* |

*Note: Decimals removed; significant loadings in bold. A = academic personal epistemology; R = religious personal epistemology. Correlations between factor A and B = 0.09; between A and C = 0.18 and between B and C = 0.03.*

factor is relatively high. As predicted by the correlation matrix, factor A is defined by the combination of the *Relativist* and *Tentative Knower*, B is defined by the combined view of the *Contextual Evidentialist* and *Convinced Knower*, and C is defined by the combined view *I-Know* and the *Private Knower*. These dual perspectives were interpreted to be *Doubtful Knower, Truth Seeker*, and *Personal Truth.*

**Factor A: Doubtful Knower**

Table 4 provides the 20 most positively and negatively salient statements for the second-order perspective named as *Doubtful Knower.* As noted by Table 4, the uncertainty of human knowledge and knowing is highly salient in this perspective. The *Doubtful Knower* does not believe in the existence of clear answers (statement number 5), that may be classified as necessarily right or wrong (1). This perspective is skeptical regarding the existence of truth (9), and this sense of uncertainty has been fostered by educational experiences (11). This uncertainty has led to the conclusion that everything is relative (7), and the world is absent of any absolute truth which may be obtained by people (6). Theoretical knowledge is therefore viewed as approximations of reality (11), a reality in which our own consciousness actively creates that which is presumably known (15). This perspective not only sees uncertainty as an inescapable act of the knowing process, but is comfortable remaining in its midst. Judgments are synonymous with opinions (20), and since opinions cannot be proven (28) they cannot be judged as being necessarily better than another (25). Since we are incapable of finding truth (21), doubtful knowers see little utility in looking to others for answers (18), and tend to weigh new information by how they feel about it (10). This perspective is skeptical regarding expert conclusions, as even experts must admit that their perspective is relative to a particular way of viewing phenomenon (34). In summary, the *Doubtful Knower* sees the process of knowing as permeated with uncertainty, is doubtful about the existence of an accessible truth,

and sees no criterion by which conflicting opinions may be evaluated.

***Table 4: Factor A: Doubtful Knower Highest and Lowest Ranked Statements***

| *Rank* | *Number* | *Statement* |
|---|---|---|
| +4 | 6 | One thing is certain, even if there is absolute truth man will never know about it and must therefore choose and venture in uncertainty. |
| +4 | 9 | I am very skeptical about what the truth is. It's amazing how you can influence information to support a view. |
| +3 | 11 | This is what I'm finding out. The more education I get, the more uncertain I am about things. When it comes to a specific issue, you must act according to the best available evidence. |
| +3 | 7 | Everything's relative, there's no truth in the world. |
| +3 | 10 | I think what one person sees to be a fact is not a fact in the eyes of another. So I tend to weigh anything in light of how I feel about it. |
| +3 | 36 | Experts disagree because their evaluation of the evidence leads them to defend different conclusions. Some experts' conclusions are more reasonable, however, and reflect a more comprehensive synthesis of available evidence. |
| +2 | 21 | People come up with different interpretations because people differ. How are we going to know what is right or wrong. |
| +2 | 34 | Experts may say that one view is better, but they would also say that this viewpoint is relative to a particular way of understanding the issue. |
| +2 | 15 | We can assume that something exists out there—but 'something' is thinking that something exists. Our consciousness is part of the world. We are creating the world at the same time. |
| +2 | 12 | Theories are not truth because they are only models which approximate experience. Despite this uncertainty, it is necessary for me to form tentative conclusions about which theories are more applicable in particular contexts. |
| -2 | 2 | Definite answers are my foundation. For example, in physics you get definite answers to a point. Beyond that point you know there are definite answers, but you can't reach them. |
| -2 | 4 | Some uncertainty is expected when solving problems, but eventually I need to find an answer. |
| -2 | 19 | Good evidence is something that agrees with me. If I really don't believe it, I really don't take it as a concrete fact. |
| -2 | 25 | Some opinions are better in the sense that they account for more evidence. |
| -3 | 18 | When I don't know the right answer to something, I try to find someone who does. |

| *Rank* | *Number* | *Statement* |
|---|---|---|
| -3 | 20 | Anybody can 'judge' something, but even then your decision is still an opinion. |
| -3 | 28 | Some people's opinions are right, and they can more or less prove that they are right, and the other people that think they're wrong maybe can't prove it. |
| -3 | 23 | When I'm uncertain about which perspective is true, I tend to go with the simplest explanation. |
| -4 | 1 | In most cases there is a right or wrong answer. No matter how you say it, it is right or wrong. |
| -4 | 5 | Information is cut and dry. It is either right or wrong. |

**Factor B: Truth Seeker**

Table 5 provides the 20 most positive and negative salient statements for the second-order factor named *Truth Seeker*. Like the *Doubtful Knower*, the *Truth Seeker* sees uncertainty as a contingent element of knowing. Unlike the *Doubtful Knower* however, this sense of uncertainty motivates the *Truth Seeker* to find an answer (statement number 4). Though information is not cut and dry (5), truth is existent (7) and concurrently accessible by human means (6). Although the *Truth Seeker* believes in a truth, the answers obtained may not be definite (2) or simple (23). The *Truth Seeker* agrees with the *Doubtful Knower* that theoretical knowledge may only approximate reality, but unlike the *Doubtful Knower* the *Truth Seeker* does not see our own consciousness as actively creating that which can be known. *Truth Seekers* also differ from *Doubtful Knowers* in their views of opinions. Though opinions may not necessarily be proven or disproven (28), there are degrees of correctness and incorrectness associated with them (27) and some may take more into consideration (26). All interpretations are therefore not valid (8) as some may differentially account for the external world. Provided that different perspective may rely on different types of evidence, the truth seeker sees value in understanding the method by which this knowledge was obtained (22). Given that truth is simultaneously existent and obtainable the *Truth Seeker* may seek out answers from others (18) or use their prior views as means to assess the trustworthiness of a claim (16). Like the *Doubtful Knower*, the *Truth Seeker* believes that experts would state that differences in opinion arise from a relative way of viewing an issue (34). However, they appear to have more confidence in expert opinion as experts are viewed as less likely to reach diverse opinions due to confusion (32). To summarize, *Truth Seekers* believe uncertainty is an aspect of knowing, and this uncertainty compels them to search for truth. Even though truth is believed to exist and is something others may have, truth is not necessarily definitive or simple. Though uncertainty exists, not all

interpretations or opinions are viewed as equally reflecting truth.

***Table 5: Factor B: Truth Seeker Highest and Lowest Ranked Statements***

| *Rank* | *Number* | *Statement* |
|---|---|---|
| +4 | 18 | When I don't know the right answer to something, I try to find someone who does. |
| +4 | 36 | Experts disagree because their evaluation of the evidence leads them to different conclusions. Some experts' conclusions are more reasonable however, and reflect a more comprehensive synthesis of the available evidence. |
| +3 | 22 | Different perspectives rely on different types of evidences, so in order to evaluate something, I need to know the 'method of knowing' for that perspective. |
| +3 | 12 | Theories are not truth because they are only models which approximate experience. Despite this uncertainty, it is necessary for me to form tentative conclusions about which theories are more applicable in particular contexts. |
| +3 | 26 | Opinions are propositions and as with any statement there are degrees of correctness and incorrectness associated with them. |
| +3 | 30 | Some opinions are better than others because they take more factors into consideration, use better methodology, and account for more data. |
| +2 | 34 | Experts may say that one view is better, but they would also say that the viewpoint is relative to a particular way of understanding the issue. |
| +2 | 4 | Some uncertainty is expected when solving problems, but eventually I need to find an answer. |
| +2 | 16 | When making a decision about what to believe, I decide what goes along with my views. |
| +2 | 20 | Anybody can 'judge' something but even then your decision is still an opinion. |
| -2 | 19 | Good evidence is something that agrees with me. If I really don't believe it, I really don't take it as a concrete fact. |
| -2 | 5 | Information is cut and dry. It is either right or wrong. |
| -2 | 32 | Experts disagree about many issues because, like everyone else, they are confused. Therefore it is my perspective that what they conclude is just their opinion. |
| -2 | 12 | We can assume that something exists out there—but 'something' is thinking that something exists. Our consciousness is part of the world. We are creating the world at the same time. |
| -3 | 6 | One thing is certain; even if there is absolute truth man will never know about it and therefore must choose and venture in uncertainty. |

| *Rank* | Number | *Statement* |
|---|---|---|
| -3 | 2 | Definite answers are my foundation. For example, in physics you get definite answers to a point. Beyond that point you know there are definite answers, but you can't reach them. |
| -3 | 8 | Anyone's interpretation is valid if that's the way they see it... I mean nobody can tell you your opinion is wrong. |
| -3 | 28 | Some people's opinions are right, and they can more or less prove that they are right, and other people that think they're wrong maybe can't prove it. |
| -4 | 7 | Everything's relative, there's no truth in the world. |
| -4 | 23 | When I'm uncertain about which perspective is true, I tend to go with the simplest explanation. |

**Factor C: Personal Truth**

Table 6 provides the 20 most salient positive and negative statements for the *Personal Truth* perspective. The *Personal Truth* perspective finds some views similar to the other two perspectives. People with this perspective do not see definitive answers as their foundation (2) nor do they believe that information is cut and dry (5). The *Personal Truth* perspective displays the least skepticism regarding the existence of truth (9), but its view of truth is rather complex. Like the *Doubtful Knower*, the *Personal Truth* perspective doesn't believe that an absolute truth is obtainable (6). It agrees with the *Truth Seeker* perspective that our consciousness does not actively create that which we are attempting to know (15). The *Personal Truth* perspective therefore recognizes uncertainty as an aspect of knowing and this leads to a conclusion that any interpretation may be valid (8). Since any interpretation may be valid, and though there may be degrees of correctness or incorrectness associated with opinions (26) ultimately deciding what to believe is a personal decision (29). In other words, though the *Personal Truth* perspective agrees that no universal truth exists, what people decide as true is only true to them. Using prior views in order to decide what is true is therefore highly salient in this perspective (16). Though a sense of detachment is valued by the *Personal Truth* perspective, they believe that judging new information against their own thoughts, feelings, and perspective is fundamental to the act of knowing (14). Since each individual determines his or her own truth, examining the method of knowing across each perspective is unimportant (22). Unlike the other two perspectives this view does not trust expert opinions and sees disagreements as primarily resulting from personal confusion. This leads them to believe that expert evaluations are opinions (32), which can in essence be true for them, but not true for anyone else. In

summary, this perspective believe in the existence of truth, but these truths are multiple and personally decided. A decision to believe something is therefore balanced against their existing subjective state, however once they decide what is true for them they do not believe that others must necessarily believe what they believe.

***Table 6: Factor C: Personal Truth Highest and Lowest Ranked Statements***

| *Rank* | *Number* | *Statement* |
|---|---|---|
| +4 | 16 | When making a decision about what to believe, I decide what goes along with my views. |
| +4 | 8 | Anyone's interpretation is valid if that's the way they see it...I mean nobody can tell you your opinion is wrong. |
| +3 | 29 | So what one person thinks is right, another person thinks is wrong; but that doesn't make it wrong. It has to be a personal decision. |
| +3 | 6 | One thing is certain; even if there is absolute truth man will never know about it and therefore must choose and venture in uncertainty. |
| +3 | 26 | Opinions are propositions and as with any statement there are degrees of correctness and incorrectness associated with them. |
| +3 | 10 | I think that what one person sees to be a fact is not necessarily a fact in the eyes of another. So I tend to weigh anything in light of how I feel about it. |
| +2 | 20 | Anybody can 'judge' something, but even then your decision is still an opinion. |
| +2 | 33 | Experts disagree because of the different ways they were brought up and/or different schools they attended. |
| +2 | 14 | I think it is best to remain a detached observer when evaluating knowledge, though I must still balance this detachment against my own thoughts, feelings, and perspective. |
| +2 | 32 | Experts disagree about many issues because, like everyone else, they are confused. Therefore, it is my perspective that what they conclude is just their opinion. |
| -2 | 17 | My views come from my teachers and how I've been brought up. As you grow up, you automatically get certain views. |
| -2 | 12 | Theories are not truth because they are only models which approximate experience. Despite this uncertainty, it is necessary for me to form tentative conclusions about which theories are more applicable in particular contexts. |
| -2 | 15 | We can assume that something exists out there—but 'something' is thinking that something exists. Our consciousness is part of the world. We are creating the world at the same time. |

| *Rank* | *Number* | *Statement* |
|---|---|---|
| -2 | 23 | When I'm uncertain about which perspective is true, I tend to go with the simplest explanation. |
| -3 | 9 | I am very skeptical about what 'truth' is. It's amazing how you can influence information in order to support a view. |
| -3 | 28 | Some people's opinions are right, and they can prove that they are right, and the other people that think they're wrong maybe can't prove it. |
| -3 | 22 | Different perspectives rely on different types of evidences, so in order to evaluate something I need to know the 'method of knowing' for that perspective |
| -3 | 5 | Information is cut and dry. It is either right or wrong. |
| -4 | 1 | In most cases there is a right or wrong answer. No matter how you say it, it is right or wrong |
| -4 | 2 | Definite answers are my foundation. For example, in physics you get definite answers to a point. Beyond that point you know there are definite answers, but you can't reach them. |

## Discussion

The present study employed Q methodology as a means to understand how personally held beliefs about knowledge and knowing intersect across different domains of knowledge. We initially asked individuals to sort the same statements across two sorting conditions: (1) when they think about their academic experiences, and (2) when they think of how they know about religion. These findings, reported elsewhere (Hathcoat & Montgomery, 2009a; 2009b), found three perspectives towards knowledge and knowing within academics and three within religion. The present study demonstrates that PE perspectives across academics and religion are related, and that these perspectives can be discussed in three higher-order perspectives. In other words, PE perspectives in academia are related to PE perspectives in religion. These relationships may be further accounted for by three underlying perspectives, named as *Doubtful Knower*, *Truth Seeker*, and *Personal Truth*. The *Doubtful Knower* is highly skeptical regarding the existence of truth, sees knowledge as essentially relative, and sees little utility in evaluative judgment. The *Truth Seeker* sees knowing as containing uncertainty, yet this uncertainty motivates them to seek truth. Truth therefore exists and may be obtained, though it may not be definitive or simple. The *Personal Truth* perspective believes in the existence of truth, but this is very different from the *Truth Seeker*. According to the *Personal Truth* perspective claims are balanced against their own thoughts, feelings, and perspectives. If they decide that something is true, it is only true for them. Others are free to construct incompatible views since this does not endanger their own idea of truth.

**Advantages of Q methodology**

Q methodology served as a guiding framework for the current study. We contend that this methodology is ideal for understanding the intersection of PE across domains of knowledge. This methodology has several distinct advantages and avoids some of the pitfalls associated with other techniques.

Previous research has indicated numerous challenges encountered by researchers attempting to understand the domain-specificity and generality of PE (Hofer, 2006b; Limon, 2006; Muis, Bendixen, & Haerle, 2006). Some of these challenges include the tacit nature of PE (Buehl & Alexander, 2006) and the psychometric challenges facing researchers who have attempted to quantify this construct (DeBacker et al., 2008). The tacit character of PE makes it difficult to assess, and researchers employing different theoretical frameworks often use different techniques for assessing PE (Duell & Schommer-Aikens, 2001). Developmental researchers frequently examine PE through lengthy interviews (Baxter Magolda, 2002; Belenky et al., 1986), or by examining participant reasoning on ill-defined problems (King & Kitchener, 1994; Kuhn, 1999). It has been suggested that these procedures may not be adept at identifying PE in specific domains of knowledge since they are aimed at more molar characteristics (Limon, 2006). R methodology provides conflicting results with PE questionnaires (Clarebout et al., 2001), and these problems occur even among researchers utilizing diverse theoretical frameworks (Duell & Schommer-Aikins, 2001). What is needed for the advancement of PE research is an accessible assessment technique which allows for the emergent complexity of perspectives towards beliefs about knowledge and knowing to become manifest without prematurely constraining what these perspectives should look like. Q methodology provides such an approach.

As noted by McKeown and Thomas (1988), Q methodology is concerned with the systematic investigation of subjectivity, which "means nothing more than a *person's communication of his her point of view*" (p. 12). The tacit nature of PE becomes manifest through the creation of a Q sort, as this allows participants to create a projected model of their subjective interaction with a set of self-referent statements (Brown, 1980). In other words, the constructed Q sort is a function of a person's subjective interface with the set of statements. We have utilized a developmental framework for PE due to the consistency of findings reported in the literature, wherein PE is said to develop in adulthood from an Absolutist to a Multiplistic, and finally toward an Evaluativist perspective (Kuhn & Weinstock, 2002). These findings allow us to systematically sample the Q set with adapted self-referent statements from previously published interviews. Though techniques

employed among developmental researchers may not be suited for capturing the subtle epistemological distinctions across content domains (Limon, 2006), Q methodology easily overcomes this challenge by altering the condition of instruction. The same self-referent statements may therefore be utilized across a wide array of knowledge domains by simply instructing individuals to think about these domains as they are completing the Q sort.

Another advantage of Q methodology, over that of traditional psychometric approaches for measuring PE, is that Q avoids the measurement problems encountered by researchers utilizing a priori meanings and categorizations. Though we have utilized findings from developmental literature in order to sample the concourse, the implementation of Q methodology allows us to circumvent the process of attaching meaning to what is observed before it has actually been observed (Brown, 1980). If subjectivity is understood as epistemological perspectives that are subjective in nature, then we must understand PE "from the subject's viewpoint as he understands them, and not from the external standpoint of the observer, however dispassionate, with his inferences and projected imputations of traits, causal mechanisms, and other arbitrary categorizations that are now of epidemic proportions in academic social sciences" (Brown, 1980, p. 321). Q methodology therefore employs a different understanding of validity and reliability (Dennis, 1992/1993). As indicated by Brown (1992/1993), Q methodology allows the individual to express his or her own subjectivity. Brown defines validity as a concern with whether the sorters represent their own perspectives. In other words, validity may be an issue if it is reasonable to suspect that that the sorter somehow misrepresented his or her own perspective. Otherwise, all subjective states are valid subjective states. What is more, when compared to R methodology, the factor structures of Q methodology tend to perform fairly well (Brouwer, 1992/1993).

In terms of reliability, Q methodology may be concerned with test-retest coefficients for individual sorts (Frank, 1956) or the replication of a particular perspective across independent studies, or what is known as *schematic reliability* (Thomas & Baas, 1992/1993; van Exel & de Graaf, 2005). Q sorts tend to be relatively stable for enduring traits, reporting correlation coefficients of 0.80 or higher (Dennis, 1992/1993). We agree with Brown (1992/1993) when stating that "factors obtained merely provide us with a single vantage-point, which we can only hope gives us a clear view of the attitudinal landscape" (p. 46). The factors we interpreted are identified from one particular way of viewing our points of data in geometrical space, and we hope that our vantage point provides us with a view which lends itself to clear interpretation. However, this subjective flexibility has not only been found to facilitate

replicability (D'Agostino, 1983), but the use of theoretical rotations may serve to illuminate the perspective of "key" individuals. For example, if we were interested in the religious PE perspectives of a particular congregation, it may be interesting to understand the congregation's PE from the perspective of the priest. The subjective nature of Q methodology should not be considered a hindrance and may instead be viewed as a strength, which allows the researcher to approach the data from multiple viewpoints.

In conclusion, the present study illustrates that Q methodology is an ideal framework for understanding the domain specificity and generality of PE. This study therefore contributes to educational theory and provides an illustration for Q scholars who may be interested in investigating higher-order structures. This study demonstrates that PE perspectives are not only associated across academic and religious domains of knowledge, which suggests that PE is domain-specific, but also that PE is interactive across diverse domains of knowing. The study illustrates that these perspectives may be reduced to a higher-order structure. This higher-order structure may be considered evidence that PE exists at a domain-general level and thereby provides greater clarification about PE across multiple levels of knowing. Compared to other methods, Q methodology provides the researcher with greater flexibility for understanding PE, and this is done without the *a priori* imposition of meaning found in traditional psychometric procedures. We believe that the flexibility inherent in this methodology provides researchers with an accessible means for understanding these perspectives across diverse fields, and for in-depth investigations of PE within individual cases. What is more, the study exemplifies the inherent beauty of this approach for understanding that our perspectives are not isolated and fragmented, but interact in ways which lend themselves to empirical investigation and elucidation.

## References

Baxter Magolda, M. B. (1992). *Knowing and reasoning in college: Gender-related patterns in students' intellectual development*. San Francisco, CA: Jossey-Bass.

Baxter Magolda, M. B. (2004). Evolution of a constructivist conceptualization of epistemological reflection. *Educational Psychologist, 39*, 31–42.

Belenky, M., Clinchy, B. M., Goldberger, N., & Tarule, J. (1985). Epistemological development and the politics of talk in family life. *Journal of Education, 167*, 9–27.

Belenky, M., Clinchy, B. M., Goldberger, N., & Tarule, J. (1986). *Women's ways of knowing: The development of self, voice, and mind.* New York, NY: Basic Books.

Bendixen, L. D., & Rule, D. C. (2004). An integrative approach to personal epistemology: A guiding model. *Educational Psychologist, 39*, 69–80.

Brouwer, M. (1992–1993). Validity: Q vs. R. *Operant Subjectivity, 16*, 1–17.

Brown, S. R. (1980). *Political subjectivity: Applications of Q methodology in political science.* New Haven, CT: Yale University Press.

Brown, S. R. (1992–1993). On validity and replicability. *Operant Subjectivity, 16*, 45–51.

Buehl, M. M., & Alexander, P. A. (2006). Examining the dual nature of epistemological beliefs. *International Journal of Educational Research, 45*, 28-42. doi:10.1016/j.ijer.2006.08.007

Chisholm, R. M. (1989). *Theory of knowledge.* Englewood Cliffs, NJ: Prentice-Hall.

Clarebout, G., Elen, J., Luyten, L., & Bamps, H. (2001). Assessing epistemological beliefs: Schommer's questionnaire revisited. *Educational Research and Evaluation, 7*, 53–77. doi: 1380-3611/01/0701-053

D'Agostino, B. (1984). Replicability of results with theoretical rotation. *Operant Subjectivity, 7*, 81–87.

DeBacker, T. K., Crowsen, M. H., Beesley, A. D., Thoma, S. J., & Hestevold, N. L. (2008). The challenge of measuring epistemic beliefs: An analysis of three self-report instruments. *The Journal of Experimental Education, 76*, 281–312.

Dennis, K. E. (1992–1993). Looking at reliability and validity through Q-colored glasses. *Operant Subjectivity, 16*, 37–44.

Desimpelaere, P., Sulas, F., Duriez, B., & Hutsebaut, D. (1999). Psycho-epistemological styles and religious beliefs. *The International Journal for the Psychology of Religion, 9*, 125–137.

Duell, O. K., & Schommer-Aikins, M. (2001). Measures of people's beliefs about knowledge and learning. *Educational Psychology Review, 13*, 419–449.

Flint, R., & Montgomery, D. (2006). *Perceptions of students regarding prerequisites for success in introductory accounting courses.* Presented to the International Society for the Scientific Study of Subjectivity, Trontheim, Norway.

Frank, G. H. (1956). Note on the reliability of Q-sort data. *Psychological Reports, 2*, 182.

Gottlieb, E. (2007). Learning how to believe: Epistemic development in cultural context. *The Journal of the Learning Sciences, 16*, 5–35. doi: 10.1207/s15327809jls1601_2.

Greene, J., Azevedo, R., & Tortney-Purta, J. (2008). Modeling epistemic and ontological cognition: Philosophical perspectives and methodological directions. *Educational Psychologist, 43,* 142–160. doi: 10.1080/00461520802178458

Hathcoat, J.D., & Barnes, L. L. B. (2010). Explaining the relationship among fundamentalism and authoritarianism—An epistemic connection. *International Journal for the Psychology of Religion, 20,* 73–84. DOI: 10.1080/10508611003607884

Hathcoat, J. D., & Montgomery, D. (2009, October). *Answering the challenge of measuring personal epistemology: A Q method approach.* Presented to the International Society for the Scientific Study of Subjectivity, St. Louis, MO.

Hathcoat, J. D., & Montgomery, D. (2010, April). *Making personal epistemology salient: A Q-method investigation of perspectives towards knowledge and knowing in education.* Presented to the American Educational Research Association, Denver, CO.

Hofer, B. K. (2006a). Domain specificity of personal epistemology: Resolved questions, persistent issues, new models. *International Journal of Educational Research, 45,* 85–95. doi:10.1016/j.ijer.2006.08.006

Hofer, B. K. (2006b). Beliefs about knowledge and knowing: Integrating domain specificity and domain generality: A response to Muis, Bendixen, and Haerle (2006). *Educational Psychology Review, 18,* 67–76. doi: 10.1007/s10648-006-9000-9

Hofer, B. K., & Pintrich, P. R. (1997). The development of epistemological theories: Beliefs about knowledge and knowing and their relation to learning. *Review of Educational Research, 67,* 88–140.

Hofer, B. K., & Pintrich, P. R. (2002). *Personal epistemology: The psychology of beliefs about knowledge and knowing.* San Francisco CA: Jossey-Bass.

King, P. M. (2000). Learning to make reflective judgments. *New Directions for Teaching and Learning, 82,* 15–26.

King, P. M., & Kitchener, K. S. (1994). *Developing reflective judgment.* San Francisco, CA: Jossey-Bass.

King, P. M., & Kitchener, K. S. (2004). Reflective judgment: Theory and research on the development of epistemic assumptions through adulthood. *Educational Psychologist, 39,* 5–18.

Kitchener, K. S., King, P. M., & Wood, P. (2000). The reasoning about current issues test. http://www.umich.edu/~refjudg/rci.pdf.

Kuhn, D. (1999). A developmental model of critical thinking. *Educational Researcher, 28,* 16–25.

Kuhn, D. (2001). How do people know? *Psychological Science, 12*, 1–8.

Kuhn, D., & Weinstock, M. (2002). What is epistemological thinking and why does it matter? In Hofer, B. K. & Pintrich, P. R., (Eds.). *Personal epistemology: The psychology of beliefs about knowledge and knowing*, (pp. 121–144). Mahwah, NJ: Erlbaum.

Limon, M. (2006). The domain generality-specificity of epistemological beliefs: A theoretical problem, a methodological problem or both? *International Journal of Educational Research, 45*, 7–27. doi: 10.1016/j.ijer.2006.08.002

McKeown, B., & Thomas, D. (1988). *Q methodology*: *Series: Quantitative applications in the social sciences*. Newbury Park, CA: Sage.

Montgomery, D. E., Sandburg, E., & Zimmerman, A. (2005). Folk epistemology in religious and natural domains of knowledge. *Journal of Psychology and Christianity, 24*, 3–12.

Muis, K. R. (2004). Personal epistemology and mathematics: A critical review and synthesis of research. *Review of Educational Research, 74*, 317–377. doi: 10.3102/00346543074003317

Muis, K. R., Bendixen, L. D., & Haerle, F. C. (2006). Domain generality and domain specificity in personal epistemology research: Philosophical and empirical questions in the development of a theoretical model. *Educational Psychology Review, 18*, 3–54. doi: 10.1007/s10648-006-9003-6

Perry, W. G. Jr. (1970). *Forms of intellectual and ethical development in the college years: A scheme.* New York, NY: Holt, Rinehart & Winston.

Pintrich, P. R. (2002). Future challenges and directions for theory and research on personal epistemology. In Hofer, B. K. & Pintrich, P. R., (Eds.). *Personal epistemology: The psychology of beliefs about knowledge and knowing*, (pp. 389–414). Mahwah, NJ: Erlbaum.

Ramlo, S., Thompson, J., & Arter, R. (2007, October). *Determining views of knowledge in several different college classrooms: A study using Q methodology*. Presented to the International Society for the Scientific Study of Subjectivity, Bethesda, MD.

Ramlo, S., Thompson, J., & Kaut, K. (2006, October). *Undergraduate students' epistemological views determined using methodology: A study involving three different courses*. Presented to International Society for the Scientific Study of Subjectivity, Trontheim, Norway.

Schommer, M. (1990). Effects of beliefs about the nature of knowledge on comprehension. *Journal of Educational Psychology, 85*, 498–504.

Schommer, M. (1994). Synthesizing epistemological belief research: Tentative understandings and provocative confusions. *Educational Psychology Review, 6*, 293, 319.

Schraw, G., Bendixen, L. D., & Dunkle, M. E. (2002). Development and validation of the *Epistemic Belief Inventory* (EBI). In Hofer, B. K. & Pintrich, P. R., (Eds.). *Personal epistemology: The psychology of beliefs about knowledge and knowing* (pp. 261–276). Mahwah, NJ: Erlbaum.

Thomas, D. B., & Baas, L. R. (1992–1993). The issue of generalization in Q methodology: "Reliability schematics" revisited. *Operant Subjectivity, 16*, 18–36.

van Exel, N. J. A., & de Graaf, G. (2005). Q methodology: A sneak preview. Available from www.jobvanexel.nl.

***Appendix: Q Set***

24. In most cases, there is a right or wrong answer. No matter how you say it, it is right or wrong.
25. Definite answers are my foundation. For example, in physics you get definite answers to a point. Beyond that point you know there are definite answers, but you can't reach them.
26. If somebody more or less has the guts to stand up and go and do all of the research on it and find out they can know something for sure.
27. Some uncertainty is expected when solving problems, but eventually I need to find an answer.
28. Information is cut and dry. It is either right or wrong.
29. One thing is certain; even if there is absolute truth, man will never know about it and therefore must choose and venture in uncertainty.
30. Everything's relative, there's no truth in the world.
31. Anyone's interpretation is valid if that's the way they see it...I mean nobody can tell you your opinion is wrong.
32. I am very skeptical about what 'truth' is. It's amazing how you can influence information to support a view.
33. I think that what one person sees to be a fact is not necessarily a fact in the eyes of another. So I tend to weigh anything in light of how I feel about it.
34. This is what I'm finding out. The more education I get, the more uncertain I am about things. When it comes to a specific issue, you must act according to the best available evidence.
35. Theories are not truth, because they are only models which approximate experience. Despite this uncertainty, it is necessary for me form tentative conclusions about which theories are more applicable in particular contexts.
36. Answers to all questions vary depending on the context in which they are asked and on the frame of reference of the person doing the asking.

7. I think it is best to remain a detached observer when evaluating knowledge, though I must still balance this detachment against my own thoughts, feelings, and perspective.
8. We can assume that something exists out there—but 'something' is thinking that something exists. Our consciousness is part of the world. We are creating the world at the same time.
9. When making a decision about what to believe, I decide what goes along with my views.
10. My views come from my teachers and how I've been brought up. As you grow up, you automatically get certain views.
11. When I don't know the right answer to something, I try to find someone who does.
12. Good evidence is something that agrees with me. If I really don't believe it, I really don't take it as a concrete fact.
13. Anybody can 'judge' something, but even then your decision is still an opinion.
14. People come up with different interpretations because people differ. How are we going to know what is right or wrong?
15. Different perspectives rely on different types of evidences, so in order to evaluate something I need to know the "method of knowing" for that perspective.
16. When I'm uncertain about which perspective is true, I tend to go with the simplest explanation.
17. You cannot say, 'you are stupid or wrong' to someone. But I think if you push them far enough, they, too would have to admit that their argument is based on assumptions that are empirically falsifiable.
18. Some opinions are better in the sense that they account for more evidence.
19. Opinions are propositions and as with any statement there are degrees of correctness or incorrectness associated with them.
20. Beliefs should be assessed probabilistically by weighing evidence across contexts.
21. Some people's opinions are right, and they can more or less prove that they are right, and the other people that think they're wrong maybe can't prove it.
22. So what one person thinks is right, another person thinks is wrong; but that doesn't make it wrong. It has to be a personal decision.
23. Some opinions are better than others because they take more factors into consideration, use better methodology, and account for more data.

1. Experts disagree because they approach the issue with different opinions already in mind. As a result, they conduct studies to support their view.
2. Experts disagree about many issues because, like everyone else, they are confused. Therefore it is my perspective that what they conclude is just their opinion.
3. Experts disagree because of the different ways they were brought up and/or different schools they attended.
4. Experts may say that one view is better, but they would also say that this viewpoint is relative to a particular way of understanding the issue.
5. Experts disagree because they are really studying different facets of the issue and the best ways to address one facet of the issue are different than the best ways to address other facets.
6. Experts disagree because their evaluation of the evidence leads them to defend different conclusions. Some researchers' conclusions are more reasonable, however, and reflect a more comprehensive synthesis of the available information.