A Q-methodological study of personal worldviews

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Abstract: Psychological research on personal worldviews has relied almost exclusively on a quantitative approach that is ill-equipped to fully capture human subjectivity. Using Q-methodology, this study revealed the multiplicity of meanings and internal structures of the worldviews of eighty Swedish adults across the domains of metaphysics, epistemology, human nature, morality, and values. Four coherent worldview Q-factors were extracted and interpreted qualitatively. Ontological and epistemological beliefs proved to be the highest in terms of subjective significance and divergence between worldviews, although they have been largely ignored in past research. The results were in part supportive of polarity theory, which describes the structure of worldviews in terms of the opposition between humanistic and normativistic positions, while also suggesting amendments to this theory, by illuminating the differences between hedonistic and openness-focused forms of humanism and between empiricist and rationalist, as well as religious and atheistic, forms of normativism, and the ways in which elements of both positions are combined or rejected. The findings illustrate how Q-methodology can be used to elaborate and correct the understandings of personal worldviews that are produced by traditional quantitative forms of inquiry.

Keywords: worldview, philosophy of life, Q-methodology, meaning, polarity theory, ideology

There has been an upsurge of interest in the study of personal worldviews in psychological science (Johnson, Hill, & Cohen, 2011; Koltko-Rivera, 2004; Nilsson, 2014b). Recent studies have, for instance, investigated beliefs in free will and determinism (Paulhus & Carey, 2011), traditional, modern, and postmodern worldviews (De Witt, de Boer, Hedlund, & Osseweijer, 2016), and assumptions about the fairness, benevolence, and controllability of the world (Kaler et al., 2008). Other research programs have begun developing systematic taxonomies of basic moral convictions (Graham, Haidt, & Nosek, 2009), "social axioms" (Leung et al., 2002), and "-isms" (Saucier, 2013) and conducting large-scale investigations of cross-cultural worldview differences (Bond et al., 2004; Saucier et al., 2015).

This research holds great promise for contributing to a rigorous psychological science that treats human beings fully as rational, meaning-making, existentially aware creatures. But all of the studies are based on quantitative analysis of individual differences in questionnaire responses. They do not take the structure *within* an individual's personal worldview into account. Rather, they isolate and detach the components of worldviews from the systems of meaning they are embedded within and derive much of their content from (Nilsson, 2015). They may also yield misrepresentation of the contents of worldviews insofar as they rely on a differential scaling paradigm (Lamiell, 1987)—for example, a person might appear to *reject* values of compassion, benevolence, and openness when s/he really does not, simply because others tend to place an even higher premium on these values.

I therefore sought to generate an understanding of personal worldviews that would be sensitive to their actual qualities and holistic structures. For this purpose, I used *Q-methodology*. At the same time, I sought to use the generated understanding to shed light on mainstream research on worldviews. For this purpose, I drew on Tomkins' (1963, 1965, 1987) *polarity theory*, because this is an integrative

theory of how and why different components of worldviews cohere that is based on both anthropological and psychological observations, rather than just a collated list of worldview dimensions derived through statistical analysis of individual differences—and it has recently been rediscovered in psychological research (e.g., Dimdins, Sandgren, & Montgomery, 2016; Nilsson & Jost, 2017; Nilsson & Strupp-Levitsky, 2016).

Q-methodology

Q-methodology is the product of William Stephenson's (1953) efforts to develop an alternative to the mainstream hypothetico-deductive, variable-oriented approach that would more adequately do justice to human subjectivity. Rather than rejecting quantitative forms of inquiry altogether, Stephenson sought to recruit the precision and rigor of quantitative analysis to facilitate qualitative interpretation, combining it with openness to the qualities of human subjectivity (Brown, 1996; McKeown, 1998), much in line with more recent attempts to elucidate the role of quantification in qualitative inquiry (Westerman, 2006; Yanchar, 2006) and with mixed-methods research (Ramlo, 2016; Stenner & Stainton-Rogers, 2004).

The central idea behind Q-methodology is that a person's subjective viewpoint is revealed through the feelings of approval, enjoyment, or agreement that are evoked as s/he is confronted with a (verbal or non-verbal) depiction of the world. The first step is therefore to present research participants with a set of materials (a "Q-sample"), such as verbal statements or pictures, which have been sampled, usually through literature review, expert opinion, interviews, or studies of the local culture, so as to be representative of the universe of viewpoints (the "concourse") that is to be investigated. The participants are asked to judge the materials, usually on the basis of their agreement to, approval of, or enjoyment of them. But rather than rating the materials one by one, as in traditional questionnaires, the participants sort ("Q-sort") the materials into a set of piles. The piles can, for example, be numbered from -3 (*Agree least*) to +3 (*Agree most*), and the participants are typically asked to place a fixed number of materials in each category (McKeown & Thomas, 2013).

While the traditional variable-oriented methodology assumes that all of the statements (or other materials) have equal subjective weight to participants and that scores on pre-defined variables can be calculated through the mechanical application of a fixed formula, the Q-sort procedure yields information about the subjective significance of the statements. Participants will usually agree and disagree with many statements, so they have to compare the statements and place the ones they feel most strongly about in the extreme categories and those they are more neutral, ambivalent, or uncertain about in the middle. Statements that are placed in the extreme categories are given most weight in the interpretation of the participants' viewpoints.

Another element of Q-methodology that sets it apart from the traditional approach is the form of statistical analysis that it employs. The Q-sort data are subjected to an "inverted" factor analysis (Stephenson, 1936) that groups together persons with similar response patterns rather than the items (e.g., statements) on which responses co-vary. In this sense, Q-methodology is a *person-oriented* approach. Although person-oriented research today frequently focuses on understanding human development following Magnusson (1999), the focus on understanding persons in terms of patterns and systems rather than a fragmented array of disparate variables is the same, whether the main focus is on development or subjectivity (Nilsson, 2015). In fact, the very reason that Stephenson used the term 'Q-methodology' in the first place was to contrast his approach with traditional 'R-methodology', in which the variable rather the person serves as the unit of analysis.

Unlike Magnusson's (1999) approach, in which person factors usually represent developmental trajectories, the factors that emerge from a Q-factor analysis are understood as unitary points of view possessed by rational beings, in light of background assumptions about human nature, the cultural context, and the biographies and current attributes of the persons who completed the Q-sorts. Rather than assigning a fixed a priori or average meaning to each item, the meanings of items are understood hermeneutically, in terms of the entire Q-factor (McKeown, 1998). The goal is to thereby generate constructs from the person's internal frame of reference rather than using variables that are pre-defined and operationalized from an external frame of reference, while the quantitative aspect of the procedure helps to prevent the researcher's frame of reference from being projected upon the person's communications (see Brown, 1980, McKeown & Thomas, 2013, Watts & Stenner, 2012, for more thorough discussions of Q-methodology).

Polarity theory

After studying those ideological controversies that have stirred up passion and dissent through the ages, Silvan Tomkins (1963, 1965, 1987) came to the conclusion that these controversies all boil down to a fundamental conflict (or polarity) between two perspectives. The first perspective, which Tomkins called *humanism*, portrays mankind as "the measure, an end in himself, an active, creative, thinking, desiring, loving force in nature", whereas the second perspective, which Tomkins called *normativism*, assumes that a person can "realize himself, attain his full stature only through struggle toward, participation in, conformity to, a norm, a measure, an ideal essence basically independent of man" (Tomkins, 1963, pp. 391-392). While the humanist sees human beings as intrinsically good, encouraging openness, warmth, unconditional love, impulsivity, play, maximization of human well-being, and reliance on imagination, subjectivity, and feelings, the normativist sees human beings as inherently bad or neutral but nevertheless

perfectible, encouraging discipline, emotional restraint, rule-following, protection of law, order, and tradition, reliance upon reason to control emotions, and reliance upon empirical data to control the excesses of reason.

Tomkins argued that this ideological conflict recurs not only across societies and historical epochs but also throughout a wide range of cultural institutions and activities:

> In ethics, the conflict is between the good defined as happiness and the good defined as self-realization, or perfectionism . . . In the theory of politics, the view of the state as a creation of the people, by the people, for the people is opposed to the view of the state as a superordinate entity through which the people attain such political freedom as is possible. It is the difference between the conservative emphasis on tradition and conformity to the status quo and the progressive's emphasis on change in the interests of the people. In jurisprudence, the contrast is between the interpretation of law as man-made and the interpretation of law as transcendental. In art, there is the recurrent polarity between romanticism and classicism; between conservation of tradition and radical experimentation; between the emphasis on the personal, on the irrational, on human feeling versus the emphasis on control, on restraint, on reason. (Tomkins, 1963, pp. 394-395)

Furthermore, in terms of metaphysics, epistemology, and mathematics, the contrast is between external realism, emphasis on hard empirical facts, and discovery of certain mathematical truths, on the one hand, and the primacy of mind and construction of new perspectives and mathematical entities through play and creative imagination on the other. At the same time, Tomkins (1963) acknowledged the existence of "middle of the road" ideologies that creatively synthesize elements of humanism and normativism, which he exemplified in terms of the philosophy of Kant and the music of Beethoven.

Tomkins realized that most persons do not have articulate and elaborate personal ideologies in this sense. But he argued that all persons have loosely organized sets of ideas and associated feelings, such as a general sense of tolerance of others, and these "ideo-affective postures" determine what elements of cultural ideologies a person tends to resonate with and adopt. Polarity theory is, in other words, a theory not just about the main cleavages between cultural worldviews but also about the worldviews of individuals. It describes how an individual's worldview is shaped through interaction between the prevailing cultural smorgasbord of ideas, and the personal presuppositions, emotional postures, and narrative reconstructions of life events that determine which of the cultural ideas are adopted and integrated into the personal worldview. This means that persons who live in the same historical and cultural settings typically share a great deal of assumptions and values—as Tomkins (1987) remarked, "a left-wing American is more like a right-wing American than either is to any member of Confucian Chi-

na"—although they differ in the extent to which they are drawn to whatever humanistic and normativistic poles emerge in their particular life setting.

In order to measure a person's tendency to resonate with humanistic and normativistic viewpoints, Tomkins (1964) constructed the *Polarity Scale*, which asks participants to endorse or reject humanistic and normativistic statements about human nature, feelings, interpersonal matters, epistemology, and society. Subsequent research has revealed that humanism and normativism are distinct from each other rather than opposite ends of a bipolar continuum, although they are negatively related in the human nature, affect, and interpersonal domains (Nilsson, 2014a; Nilsson & Strupp-Levitsky, 2016). Scores on the original Polarity Scale and its successors have proved to correlate with measures of political and religious orientation, values, personality traits, and emotions (e.g., de St. Aubin, 1996; Dimdins, Sandgren, & Montgomery, 2016; Stone & Schaffner, 1997; Nilsson & Strupp-Levitsky, 2016), and studies with a more qualitative orientation have shown that humanism and normativism are reflected in life-story narratives (e.g., Albaugh & McAdams, 2007; de St. Aubin, Wandrei, Skerven, & Coppolillo, 2006; Shaw, 2007; see Nilsson, 2013, for a review). In addition to this, Thomas (1976) let participants Q-sort the statements that make up this scale and came to the conclusion that the actual humanists were similar to the theorized humanist, whereas the normativists were less rigid and intolerant than the theorized normativist and orthogonal rather than polar opposites of the humanists in terms of their concerns.

Overview of research

I carried out a Q-methodological investigation of the worldviews of eighty Swedish adults, by asking participants to Q-sort a set of statements about worldview issues. Neither the sampling of statements nor the analysis and interpretation of participants' Q-sorts were based on polarity theory. Rather, I wanted to understand the worldviews of the participants in their own right and to see whether a qualitative, "bottom-up" approach that was not constrained by any particular theory would yield (a) new insights relevant to the study of personal worldviews *per se* and (b) new insights specifically about polarity theory, by revealing (or failing to reveal) worldviews that are interpretable in terms of the theorized opposition between humanism and normativism. I also conducted quantitative analysis of the relationships between the Q-sorts and scores on humanism and normativism.

Method

Participants and cultural context

The participants were thirty men and fifty women (M_{age} = 23.0 years, SD = 4.3 years) who were predominantly students (93.8%) of the humanities or social sciences (82.5%)

at a large Swedish university. They received a lottery ticket and information about the study as compensation for their participation. All materials were presented in Swedish.

Swedes are perhaps highest in the world in terms of secular-rational and self-expression values (Inglehart & Welzel, 2010), and Sweden stands out by having an unusual history of peace, prosperity, and equality. In addition to this, persons who are drawn to human-centered disciplines are likely to be more humanistic and less normativistic on average than persons who are drawn to nature-centered disciplines (Babbage & Ronan, 2000). All of this made it likely that the participants would be disproportionately humanistic and averse to normativism. But according to Tomkins (1963, p. 395), one of the most "extraordinary characteristics" of the polarity between humanism and normativism is that it "inevitably recurs" even in domains that are primarily humanistic or normativistic in orientation.

Materials and procedures

All measures and results of the study that were cut from this paper are presented in supplementary documentation.

Q-methodology. I first conducted a literature review, compiling a list of more than one thousand statements. Most of these statements were either drawn from questionnaires that have been used in psychological research on various aspects of worldviews (see Nilsson, 2013, Koltko-Rivera, 2004, for reviews) or formulated to capture the main philosophical doctrines that have persisted through the ages. The sources of inspiration included analytic and existentialist philosophy, Eastern (vs. Western) thought, and a range of research programs (Duell & Schommer, 2001; Forsyth, 1980; Meece, 2001; Rokeach, 1979; Wrightsman, 1992). The statements covered five different categories: metaphysics (e.g., spiritualism, reductionism, free will, determinism, and meaning in life), epistemology (e.g., relativism, rationalism, empiricism, scientism, and naïve realism), human nature (e.g., egoism, rationality, and independence), morality (e.g., utilitarianism, deontology, and relativism), and values (e.g., openness, benevolence, self-discipline, peace and equality, respect and recognition). I reduced the set of statements by identifying recurring themes, eliminating redundancies, and prioritizing those I thought would yield the most useful information until fifty-nine statements remained (see Table 1). Using between forty and eighty elements to Q-sort is generally recommended (Watts & Stenner, 2012). The Q-sorting was initially piloted.

The participants sorted the 59 statements into seven different categories, ranging from -3 (*agree least*) to +3 (*agree most*). They were instructed to place a fixed number of statements in each category (6, 8, 10, 11, 10, 8, 6) and to think about which statement characterizes their worldview the most. Q-sorting was performed through the java-script program *Web-Q* (Schmolck, 2017) on laptop computers in a lab (see also *qmethod.org*).

I performed a Q-factor analysis using *PQMethod* 2.0 (Schmolck, 2017), with principal components extraction, varimax rotation, and automatic flagging. Each factor is calculated as a weighted average of the Q-sorts that define the factor. A Q-sort defines a factor if (a) it loads strongly on that factor, and (b) it does not load approximately equally strongly on any other factor (i.e., it is not confounded).

I reduced the number of factors until four factors remained. The reported correlations are based on the participants' loadings on the Q-factors. I used a Fisher transformation on the factor loadings to deal with deviations from normality (e.g., a rightward skew for the first factor). Q-sort data were missing for one person due to a computer failure.

It should be noted that there are other ways of doing Q-methodology than the one used in this study. Most important, some methodologists favor what might be called a "traditional" approach to Q-methodology, rejecting the computerized Q-sort procedures that are currently popular because they interfere with the researcher's face-to-face contact with participants, as well as methods of statistical analysis such as principal components analysis and varimax rotation (which maximizes independence of the factors) that might impose artificial constraints on the data, while others urge the need for methodological innovation and adaptation of elements of the R-methodological toolbox (see Akhtar-Danesh, 2016, Brown, 2016, for a recent illustration of this debate). In the current case, I considered the standardized approach to data collection (i.e., computerized data collection and a fixed rather than free response format) and data analysis (PCA, varimax rotation, and automatic flagging of persons who define the factors) more appropriate because (1) my ambition was to illustrate how Q-methodology can fertilize mainstream quantitative research on worldviews, and (2) using a method of factor rotation that is guided primarily by theoretical judgments rather than a priori statistical norms, which is what the traditional Q-methodologists recommend, would entail a risk of imposing polarity theory on the factor solution.

I did, however, make one methodological decision that was not entirely determined a priori in the data analysis phase, and that was the number of Q-factors to extract. I reiterated the factor analysis while gradually reducing the number of extracted factors until all of them were intelligible. This occurred when five persons defined the smallest factor. Although a diverse range of a priori criteria for the identification factors have also been proposed, some of which would suggest that even smaller factors (with as few as two defining Q-sorts) be extracted (Watts & Stenner, 2012), factors with very few defining Q-sorts are not always interpretable, and they may lack stability across samples even if they seem meaningful (Fairweather, 2005).

In addition to this, I did include a post-sorting evaluation *questionnaire* as a substitute for the post-sorting *interview* that often accompanies traditional Q-methodological studies (Watts & Stenner, 2012), as elaborated below.

Humanism and normativism. The participants filled out the *Modified Polarity Scale* (de St. Aubin, 1996), which

measures humanism ($\alpha = .78$; $M = 147.0$, $SD = 11.2$) and normativism ($\alpha = .76$; $M = 98.6$, $SD = 11.3$) with 40 items each, using a 5-point Likert scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). Sample items include "Human beings are basically good" (humanism) and "To act on impulse is to act childishly" (normativism). Humanism is computed as the sum of responses to the humanism items and normativism is computed as the sum of response to the normativism items[1]. When data were missing for only one or two items, I calculated the participants score on the basis of the items that s/he had responded to. Two persons had more missing data and were therefore excluded from analyses involving these variables.

Evaluation questionnaire. In the final part of the study, the participants were asked to rate the subjective significance of different parts of the study and voice open-ended comments, opinions, and criticisms of the study. They first reported the extent to which they felt that the different parts of the study and the study as a whole would say something important about their view of the world ($M = 3.99$, $SD = .74$ for the Q-sorting part; $M = 3.71$, $SD = .96$ for the Modified Polarity Scale; $M = 4.04$, $SD = .79$ for the study as a whole; $\alpha = .87$ for five different ratings in total) on a 5-point Likert scale ranging from 1 (*nothing was important*) to 5 (*everything was important*). I also included open-ended questions to let the participants explain and justify their ratings, comment on whether any particular area of belief was under- or overrepresented in the study at large, and give voice to additional criticisms and comments. I asked the participants verbally about their thoughts about the study after they had completed the questionnaire.

The most prevalent critique of the study was that it included too many big and difficult questions that could not be devoted as much time and concentration as they would have deserved. Some participants also had concerns about specific statements being vague, abstract, or ambiguous, and said that they would have wanted the opportunity to explain what they meant by their answers. At the same time, many participants said that it was fun and interesting to participate, that the study was comprehensive and well-designed, and that it stimulated their curiosity.

Results

The Q-factor analysis yielded four factors that were de-

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[1] The scoring procedure reported by de St. Aubin (1996) accidentally (confirmed through personal communication 2003-12-08) switched humanism and normativism and reversed the response bar (1 = *Strongly agree*; 5 = *Strongly disagree*). Because some studies have used the reversed scoring bar, I gave half participants the standard response bar and half the reversed one. I found no differences between the two groups and therefore aggregated them.

fined by thirty-six, nineteen, nine, and five persons. The persons who defined each factor loaded between .40 and .79 on that factor in absolute terms (one person who defined factor four loaded negatively on that factor). The eigenvalues of the factors were 26.64, 5.76, 3.90, and 3.01; the variance accounted for was 23%, 15%, 8%, and 4%; the standard errors of the factor scores were .082, .114, .174, and .218; and the composite reliabilities of the factors were .993, .987, and .952. Each person's factor loadings are illustrated in Figure 1 and the factor scores are displayed in Table 1.

Before interpreting the factors, I looked at which statements discriminated the factors best (which is quantified by the PQMethod program). The statements about metaphysics and epistemology came out on top. All five ontology statements and five of seven epistemology statements were in the top third of statements that showed least consensus between the worldviews and a statement about the purpose of life was the fifth least consensual item. Statements concerning human nature and morality were quite even in terms of consensus between factors, but the statements concerning morality were lower in terms of subjective significance. The values showed the greatest variability in terms of consensus between the factors, including both the most disagreed statements (decency, hedonism) and the most consensual ones (inner peace, benevolence, respect and recognition, peace and equality).

Worldview factor 1

This worldview is characterized by a strong opposition to reductionism and scientism, including (S10) "There is a rational explanation for everything since events are produced in accordance with the laws of physics" (-1.43), (S12) "Human consciousness and behaviour can be fully explained by electrochemical reactions in the brain and the nervous system" (-1.69), and (S3) "Science will eventually give us answers to almost all of the important questions we have" (-1.72). In part, these convictions seem to be motivated by spiritualism, expressed in a belief in (S13) "higher powers in the universe that cannot be explained by scientific methods" (.84). They also appear to involve epistemological considerations, including a rejection of (S4) "Disciplines where you cannot find clear and unambiguous answers are worth less than disciplines where you can find them" (-1.66).

Although this worldview incorporates the belief that (S9) "Our thoughts and feelings create the world which we live in" (1.22), this does not appear to express strict ontological idealism or epistemological relativism (e.g., S14, S42). Rather, it appears to express an emphasis on the power of mental activity, personal perspectives, and free choices, including (S40) "How happy you basically are is not at all determined by external circumstances but rather by how you look upon these" (1.16) and (S39) "If you are determined to do something and work hard to achieve it, you can
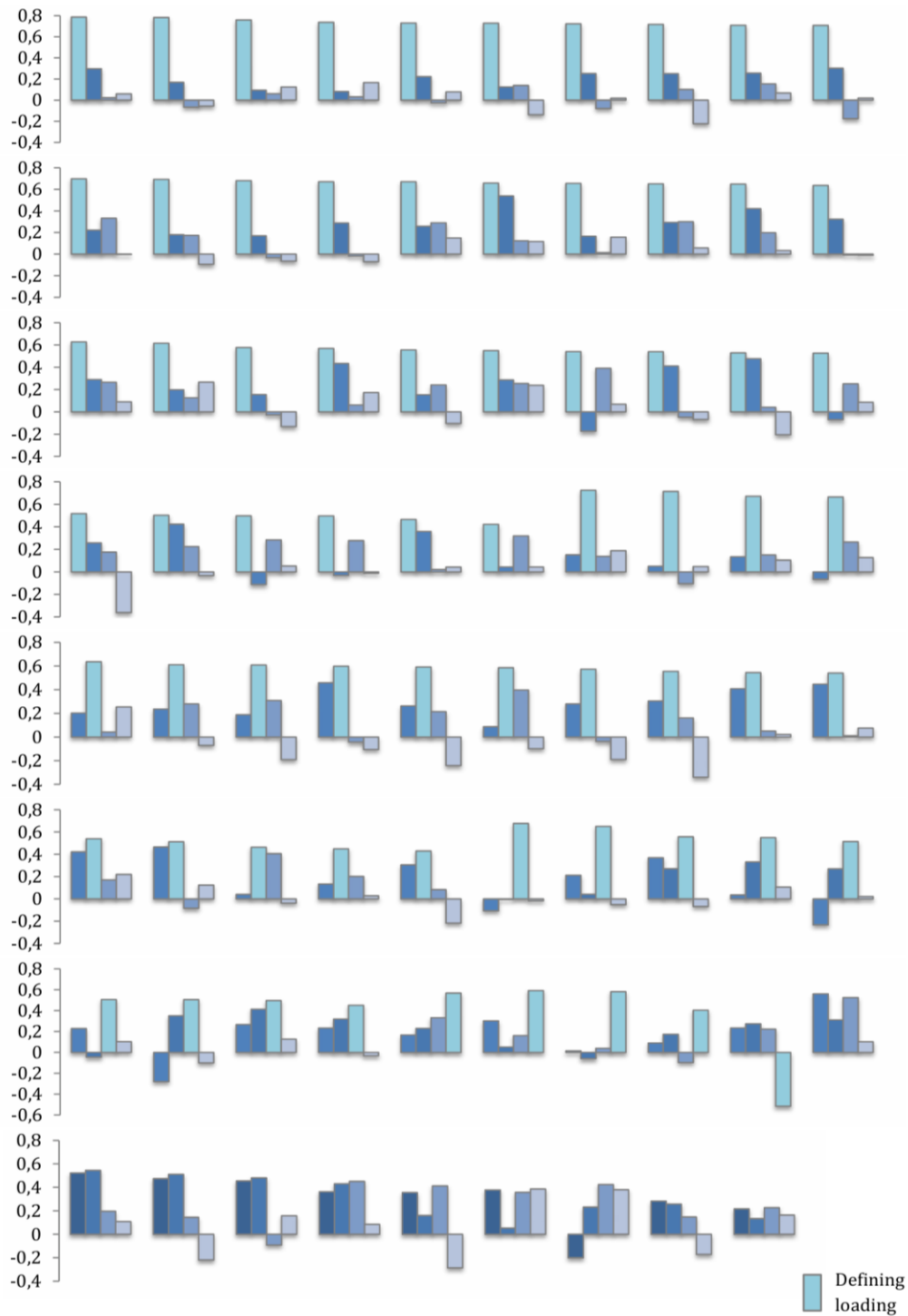
Figure 1.

Factor loadings for all participants. The factors loadings are arranged from Factor 1 to Factor 4 for each participant. The participants are arranged in terms of whether (and how strongly) they defined Factor 1, Factor 2, Factor 3, Factor 4, or no factor.

Table 1
Q-sample of statements and factor scores

| | Q-sample of statements | Worldview Q-factor | | | |
		1	2	3	4
S1	All knowledge is based on experience and observation; theories are by themselves just meaningless abstractions.	-.96	-1.41	-1.80	.53
S2	With understanding and clear, logical thinking you can solve almost any problem and increase your control over events.	-.34	-.44	.68	-.41
S3	Science will eventually give us answers to almost all of the important questions we have.	-1.72	-1.50	-.03	.15
S4	Disciplines where you cannot find clear and unambiguous answers are worth less than disciplines where you can find them.	-1.66	-1.56	.63	.54
S5	You should be as critical of authorities and ready to challenge them as everyone else.	1.28	1.89	2.01	-1.02
S6	You learn the most when you try to create your own view or figure out how something works by yourself.	.80	1.37	1.81	-.40
S7	Most problems have one best solution regardless of how difficult they are.	.02	-.41	.29	.53
S8	The main purpose of science should be to discover the nature of the world we live in rather than creating practical applications.	-.51	-.51	.21	-.02
S9	Our thoughts and feelings create the world which we live in.	1.22	1.40	-.78	.09
S10	There is a rational explanation for everything since events are produced in accordance with the laws of physics.	-1.43	-.99	.82	-.81
S11	The world is basically made of solid and indivisible particles and nothing else.	-1.25	-.78	1.00	-1.39
S12	Human consciousness and behaviour can be fully explained by electro-chemical reactions in the brain and the nervous system.	-1.69	-.86	.70	.37
S13	There are higher powers in the universe that cannot be explained by scientific methods.	.84	-.46	-2.04	-.13
S14	There is no ultimate right or wrong; everything is true in relation to some perspectives and false in relation to others.	.00	1.60	-.47	-.36
S15	You should act on moral principles rather than follow temptations and impulses in the moment.	-.19	-.84	.86	2.07
S16	People should let themselves be controlled more by feelings and less by rules and principles.	.25	.27	-.87	-1.02
S17	Because we are all different and everything changes, there cannot be any moral truths that hold up in all societies and times.	-.47	.96	-.26	-.42
S18	The solution to almost every human problem should be based on the situation, not on some general moral rule.	.18	.97	.09	.52
S19	We should always try to act so that our actions produce the best possible consequences, regardless of whether we violate any rules, duties, or principles.	.17	-.06	1.09	1.20
S20	It is impossible to care about all human beings, let alone all living creatures, but you should be loving, loyal, and faithful to persons who are close to you.	-.42	1.31	-.43	1.23
S21	To get ahead in life, it is sometimes necessary to step on other persons.	-1.65	-.75	-.33	-1.33
S22	There is no fixed basic human nature; it is completely up to each and everyone to become the persons they want to become. We are free to choose our own character and meaning in life.	.44	-1.17	-.77	-.98
S23	Anger, violence, and aggression arise when needs for love and warmth are not satisfied and are not a part of the basic human nature.	.69	-.57	-.29	1.08
S24	Human beings have needs and instincts that make them basically egoistic and aggressive beings.	-1.56	-.37	-.70	-1.00
S25	Everything human beings do is deep down because they believe they benefit from it; even love is really nothing more than self-interest.	-1.29	.62	-.55	-.09
S26	The basic force within us all, which can flourish if the environment per-	.95	-.92	-.76	1.04

	mits it, is to develop into loving and compassionate beings.				
S27	The world is basically a friendly place; people are lonely because they don't try to be friendly.	-.22	-1.62	-.64	.16
S28	Regardless of how close a relationship between two persons is, there is always a lot of uncertainty and conflict in it.	-1.07	-.73	-.32	-1.28
S29	Most people pretend to care about each other more than they really do and would take advantage of each other if given the chance.	-1.21	.61	.23	-.11
S30	Most people claim that they have standards of honesty and morality, but few behave in accordance with them when the chips are down.	-.11	1.42	.63	-.01
S31	Human beings are basically very similar.	.28	.00	-.29	.76
S32	Most people would stick to their opinion and express it even if other people do not agree.	-1.07	-1.73	-2.08	-1.21
S33	Most persons understand their own strengths and weaknesses and why they behave as they do.	-.75	-2.13	-1.32	-1.55
S34	You can get a good view of what a human is like through a short conversation.	-1.18	-1.30	-1.24	-1.95
S35	In the long run, it is hard to feel comfortable with persons who have values very different from your own.	-.27	.30	.27	-.24
S36	You should let reason be controlled by the heart.	-.06	-.81	-.92	-1.18
S37	Human beings are not at all free to make all choices; rather they are completely bound by the limits placed by inheritance and the environment, and random events have a lot of influence on their lives.	-1.04	.12	.58	1.14
S38	We create our own destiny and have full responsibility for all of our actions.	.40	-.64	-.16	-1.19
S39	If you are determined to do something and work hard to achieve it, you can do almost anything.	1.27	.36	-.09	.40
S40	How happy you basically are is not at all determined by external circumstances, but rather by how you look upon these.	1.16	.85	.27	-1.32
S41	To be happy is more important than knowing the truth about things; sometimes it can be necessary to close your eyes to certain things to be happy.	-.81	-.18	-1.02	1.21
S42	I think that there is some ultimate meaning of the life of human beings (for example being happy or reproducing your genes).	.85	.00	-1.98	.36
S43	Some negative feelings, like for example anxiety, are a natural and inevitable part of life; we should accept them instead of trying to eliminate them because they help us grow as persons.	.25	.24	1.04	-.96
S44	Reaching a sense of inner peace is more important than experiencing passion and temporary highs.	.34	.23	.33	.66
S45	If you enjoy the life you live, what you accomplish does not matter.	.13	.45	-1.19	2.08
S46	It is important to think about questions like who you are and why you are here.	.68	.51	.45	-.64
S47	It is important to be aware of your own true feelings even if they are unpleasant.	1.25	1.50	1.05	-.52
S48	It is important to think independently, to say what you think, and to stand by it regardless of what others think.	1.31	1.17	1.84	-.81
S49	It is important to be understanding, helpful, tolerant, and forgiving.	1.59	1.11	1.52	1.66
S50	It is important to be self-disciplined, conscientious, and competent.	.16	-.04	.74	.21
S51	It is important to strive for peace and equality in the world.	1.93	.71	2.24	1.18
S52	It is important to get the respect and recognition you deserve.	.91	.79	.49	1.09
S53	It is important to experience and create beauty.	.55	-.10	-.19	-.83
S54	It is important to act in a decent and proper way not to upset others.	-.97	-1.01	-.60	2.29
S55	It is important not to be too closed in your own beliefs so that you can grow and change.	1.21	1.23	1.47	.27
S56	It is important to make it on your own and carry your burdens without complaining.	-.99	-1.05	-.99	-.51
S57	It is important that other persons who are close to you know who you are	1.30	1.09	.29	-.51

deep down.

S58 It is important to strive to understand your own inner world of ideals, feelings, and dreams. 1.48 1.32 -.24 .07

S59 It is important to enjoy events in the present moment without worrying about the future. .97 .54 -.30 1.31

Note. The statements have been translated from Swedish to English. Positive values indicate more agreement and negative values indicates more disagreement.

do almost anything" (1.27), and a rejection of (S1) "All knowledge is based on experience and observation; theories are by themselves just meaningless abstractions" (-.96). Still, this worldview does not go as far as to ignore the constraints of external causal factors—the agreement is considerably weaker when it comes to the existentialistic notions that (S22) "There is no fixed basic human nature; it is completely up to each and everyone to become the persons they want to become" (0.40) and (S38) "We create our own destiny and have full responsibility for all of our actions" (0.40).

Human beings are, furthermore, seen as basically good, including the belief that (S26) "The basic force within us all, which can flourish if the environment permits it, is to develop into loving and compassionate beings" (.95) and a rejection of (S24) "Human beings have needs and instincts that make them basically egoistic and aggressive beings" (-1.56), (S29) "Most people pretend to care more about each other than they really do and would take advantage of each other if given the chance" (-1.21), and (S28) "Regardless of how close a relationship between two persons is, there is always a lot of uncertainty and conflict in it" (-1.07). This does, however, not entail the conviction that people tend to follow (S30) "their standards of honesty and morality" (-.11), (S32) "stick to their opinion and express it" in the face of dissent (-1.07), or (S33) "understand their own strengths and weaknesses" (-.75).

Among the statements that pertain to values and morality, this worldview incorporates the strongest responses to statements that express interpersonal humanism (or lack thereof), such as (S49) "It is important to be understanding, helpful, tolerant, and forgiving" (1.59), (S21) "To get ahead in life, it is sometimes necessary to step on other persons" (-1.65), and particularly (S51) "It is important to strive for peace and equality in the world" (1.93). These were followed by statements pertaining to intra- and inter-personal openness, such as (S58) "It is important to strive to understand your own inner world of ideals, feelings, and dreams" (1.48), (S55) "It is important not to be too closed in your own beliefs so that you can grow and change" (1.21), and (S57) "It is important that other persons who are close to you know who you are deep down" (1.30). The values of getting (S52) "the respect and recognition you deserve" (.91), acting in a (S54) "decent and proper way" (-.97), and to (S56) "make it on your own" (-.99) were also relatively high in terms of psychological significance.

Overall, the worldview revealed by the first and largest

Q-factor is a clear example of what Tomkins (1963, 1965) would have thought of as a typical humanistic worldview (which is combined with a lack of normativism). The rejection of naturalistic reductionism, the emphasis on the power of perspectives, the optimism about human nature, and the openness and self-transcendence values are all core themes of the theorized humanistic worldview. Indeed, loadings on the first Q-factor turned out to correlate fairly strongly positively with humanism ($r = .34$, $p = .003$) and negatively with normativism ($r = -.45$, $p < .001$). Humanism and normativism together accounted for 31.9% of the variance of the factor loadings.

Worldview factor 2

Like the first worldview, the second worldview incorporates a strong rejection of scientism and common sense empiricism, including (S3) "Science will eventually give us answers to almost all of the important questions we have" (-1.50), (S4) "Disciplines where you cannot find clear and unambiguous answers are worth less than disciplines where you can find them" (-1.56), and (S1) "All knowledge is based on experience and observation; theories are by themselves just meaningless abstractions" (-1.41). It also rejects (somewhat less strongly) reductionism (S10-S12) about causal explanation (-.99), consciousness and behavior (-.86), and the material world in general (-.78).

But in this case, these beliefs do not seem to have anything to do with spiritualism; for instance, the notion that there are (S13) "higher powers in the universe" (-.46) has little psychological significance here. Rather, they seem to emerge from a postmodern viewpoint that rejects absolute truths and universal principles, incorporating particularly epistemological relativism, as is evident in (S14) "There is no ultimate right or wrong; everything is true in relation to some perspectives and false in relation to others" (1.60) and also a degree of moral relativism, as expressed in (S17) "There cannot be any moral truths that hold in all societies and times" (.96) and (S18) "The solution to almost every human problem should be based on the situation, not on some general moral rule" (.97). This worldview also strongly endorses (S5) "You should be as critical of authorities and ready to challenge them as everyone else" (1.89), (S6) "You learn the most when you try to create your own view or figure out how something works by yourself" (1.37), and (S9) "Our thoughts and feelings create the world which we live in" (1.40), which fit well into a post-

modern worldview.

Furthermore, this worldview incorporates a belief in (S40) the power of perspective in determining happiness (.85). But statements that more directly pertain to free will have low significance, and the stronger claims that human beings have (S38) full responsibility for their actions (-.64) and (S22) complete freedom to choose their own character (-1.17) are rejected. Similar to this, no clear and consistent view of human nature is expressed—human beings are neither thought of as (S26) basically "loving and compassionate" (-.92) nor as (S24) "egoistic and aggressive" (-.37). This might reflect a postmodern rejection of the idea of a universal human nature. But a hint of pessimism is nevertheless discernible in (S26) and also (S25) "Everything human beings do is deep down because they believe they benefit from it" (.62). When it comes to what people actually do, a clearer pessimism is apparent in the very strong rejection of the ideas that people tend to (32) "stick to their opinion and express it even if other people do not agree" (-1.73), and (S33) "understand their own strengths and weaknesses and why they behave as they do" (-2.13), as well as (S27) "The world is basically a friendly place; people are lonely because they don't try to be friendly" (-1.62).

Similar to the first worldview, high rankings are given to the value of openness, for instance to (S47) "your true feelings" (1.50), (S58) "inner world of ideals, feelings, and dreams" (1.32), and (S55) growth and change in your beliefs (1.23), and to the value of (S48) thinking independently and standing by it (1.17), while the importance of acting (S54) "in a decent and proper way" (-1.01) is rejected. The concern about (S49) being "understanding, helpful, tolerant, and forgiving" (1.11), (S51) striving for "peace and equality" (.71), and (S21) not stepping on others (-1.65) are weaker than in the first worldview, coupled with (S20) "It is impossible to care about all human beings, let alone all living creatures; but you should be loving, loyal, and faithful to persons who are close to you" (1.31).

Overall, the worldview revealed by the second Q-factor is more difficult to understand in terms of the polarity between humanism and normativism than the first one. The postmodern metaphysics and epistemology is in stark contrast to normativism, yet it is not a crystal-clear example of humanism either—humanism is characterized by a trust in imagination, subjectivity, and mystical experiences as routes to knowledge, rather than epistemological relativism, skepticism, or anarchism *per se*. The openness values are aligned with humanism, but the view of human nature is, if anything, slightly more aligned with normativism than humanism, and the interpersonal humanistic values are relatively weak compared to the three other worldview factors. The loadings on this worldview factor turned out to be negatively correlated with humanism ($r = -.29$, $p = .011$) and the correlation with normativism was also negative but did not reach significance ($r = -.15$, $p = .20$). Humanism and normativism together accounted for 10.9% of the variance of the factor loadings.

Worldview factor 3

In contrast to the first two worldviews, this worldview incorporates a moderate endorsement of statements that express scientific naturalism, such as (S10) "There is a rational explanation to everything since events are produced in accordance with the laws of physics" (.82), (S11) "The world is basically made of solid and indivisible particles and nothing else" (1.00), and (S2) "With understanding and clear, logical thinking you can solve almost any problem and increase your control over events" (.68), and a *very strong* rejection of the notions that there are (S13) "higher powers in the universe that cannot be explained by scientific methods" (-2.04) and an (S42) "ultimate meaning of the life of human beings" (-1.98). A hint of skepticism about free will is discernible in (S37) human action is constrained by the "limits placed by inheritance and the environment" (.58) and (S22) human beings are beings are completely free "to become the persons they want to become" (-.77), but other statements that pertain to free will have even less subjective significance.

This scientific naturalism also appears to be reflected in the slight rejection of (S9) "Our thoughts and feelings create the world which we live in" (-.78) and endorsement of (S4) "Disciplines where you cannot find clear and unambiguous answers are worth less than disciplines where you can find them" (.63). Still, the epistemology of this worldview is very far from a naïve common sense empiricism—to an even greater extent than any of the other worldviews that emerged from the Q-factor analysis, rejects the notion that (S1) "All knowledge is based on experience and observation; theories are by themselves just meaningless abstractions" (-1.80)—and it also places a particularly strong emphasis on the role of (S5) being "critical of authorities and ready to challenge them" (2.01) and (S6) learning by trying "to create your own view or figure out how something works by yourself" (1.81). Rational considerations are, furthermore, central to the moral imperatives of this worldview, as manifested in (S15) "You should act on moral principles rather than follow temptations and impulses in the moment" (.86), (S36) "You should let reason be controlled by the heart" (-.92), and (S19) "We should always act so that our actions produce the best possible consequences" (1.09).

Similar to the second worldview factor, no clear view of human nature is apparent in this worldview—human beings are neither thought of as basically (S26) "loving and compassionate" (-.76) nor as (S24) "egoistic and aggressive" (-.70), and everything people do is not (S25) "deep down because they believe they benefit from it" (-.55) but (S27) the world is not "basically a friendly place" (-.64) either. Similar to the other worldviews, a much greater pessimism is apparent in the rejection of the claims that people tend to (S32) "stick to their opinion and express it even if other people do not agree" (-2.08) and (S33) "understand their own strengths and weaknesses and why they behave as they

do" (-1.32).

This worldview gives as high or even higher priority than any of the other worldviews to the values of (S49) being "understanding, helpful, tolerant, and forgiving" (1.52), (S55) not being "too closed in your own beliefs so that you can grow and change" (1.47), and particularly (S51) striving for "peace and equality" (2.24) and (S48) thinking independently and standing by it "regardless of what others think" (1.84). At the same time, it incorporates more of an emphasis on self-discipline, accomplishment, and acceptance of the dark aspects of existence than the other worldviews do, as expressed in the endorsement of (S50) "It is important to be self-disciplined, conscientious, and competent" (.74), and the rejection of (S45) "If you enjoy the life you live, what you accomplish does not matter" (-1.19) and (S41) "To be happy is more important than knowing the truth about things; sometimes it is necessary to close your eyes to certain things in order to be happy" (-1.02).

Overall, the third Q-factor appears to incorporate elements of both humanism and normativism. For instance, the external realism and emphasis on acting in accordance with rational considerations are characteristically normativistic, while the rejection of common sense empiricism and emphasis on questioning authorities are characteristically humanistic. Moreover, the values include both humanistic ones, such as epistemic openness and benevolence, and normativistic ones, such as self-discipline, competence, and accomplishment. Nevertheless, this worldview appears to have been less humanistic than the other worldviews overall (i.e., compared to the cultural "baseline"). The factor loadings turned out to be positively correlated with normativism ($r = .38$, $p = .001$) and negatively correlated with humanism ($r = -.31$, $p = .007$). Humanism and normativism together accounted for 24.5% of the variance of the factor loadings.

Worldview factor 4

In sharp contrast to the other worldview Q-factors, this worldview includes at least a modicum of common sense empiricism and trust in authorities, as expressed in the responses to (S1) "All knowledge is based on experience and observation; theories are by themselves just meaningless abstractions" (.53), (S4) "Disciplines where you cannot find clear and unambiguous answers are worth less than disciplines where you can find them" (.54), and (S5) "You should be as critical and ready to challenge authorities as everyone else" (-1.02). At the same time, it strongly rejects the naturalistic ideas that (S11) "The world is basically made of solid and indivisible particles and nothing else" (1.39) without endorsing the notion that (S13) there are "higher powers in the universe" (-.13) or that (S10) "there is a rational explanation to everything" (-.81).

This worldview also incorporates an even stronger moral imperative to act on the basis of rational considerations

than the third worldview does, as manifested in (S15) "You should act on moral principles rather than follow temptations and impulses in the moment" (2.07), (S19) "We should always act so that our actions produce the best possible consequences, regardless of whether we violate any rules, duties, or principles" (1.20), and (S36) "You should let reason be controlled by the heart" (-1.18). It also amply acknowledges external constraints on (S37) free will (1.14) and (S40) happiness (-1.32) and rejects the idea that human beings (S38) "have full responsibility" for all of their actions (-1.19) and (S22) choose their "own character and meaning in life" (-.98).

Human beings are seen as basically (S26) "loving and compassionate beings" (1.04) rather than (S24) "egoistic and aggressive" (-1.00), (S23) "anger, violence, and aggression" are not seen as part human nature (1.08), and (S28) "uncertainty and conflict" are not seen as integral to human relationships (-1.28). Still this worldview shares with the others a skepticism of the idea that most people (S32) "stick to their opinion and express it even if other people do not agree" (-1.21) and (S33) "understand their own strengths and weaknesses and why they behave as they do" (-1.55).

This worldview also incorporates a rather strong emphasis on values that express interpersonal humanism and ethics of care, such as (S49) being "understanding, helpful, tolerant and forgiving" (1.66), (S51) striving "for peace and equality" (1.18), and (S20) being "loving, loyal and faithful to people who are close to you" (1.20), while rejecting the claim that (S21) "To get ahead in life, it's sometimes necessary to step on other persons" (-1.33). But in stark contrast to the other worldviews, it also strongly values hedonism, as expressed in (S59) "It is important to enjoy events in the present without worrying about the future" (1.31), (S45) "If you enjoy the life you live, what you accomplish does not matter" (2.08), coupled with inauthenticity, as is clear from (S41) "To be happy is more important than knowing the truth about things; sometimes it can be necessary to close your eyes to certain things in order to be happy" (1.21), (S43) "Some negative feelings, like for example anxiety, are a natural and inevitable part of life" (-.96), and (S48) "It is important to think independently, to say what you think, and to stand by it regardless of what others think" (-.81). This worldview is also characterized by a rejection of (S53) "It is important to experience and create beauty" (-.83), and an emphasis on (S52) getting "the respect and recognition you deserve" (1.09) and particularly (S54) acting "in a decent and proper way not to upset others" (2.29).

Overall, the worldview revealed by the fourth Q-factor appears incorporate strong elements of both humanism and normativism. The slight tendency toward common sense empiricism and trust in authorities, the reliance on rational considerations in the moral realm, and the values of respect and recognition, as well as decency and proper action, are all characteristically normativistic. The optimistic view of

human nature and the ethical self-transcendence and hedonism values are strongly humanistic, but the inauthenticity is not. Indeed, the factor loadings were positively correlated with normativism ($r = .32$, $p = .005$) and the correlation with humanism was also positive but not significant ($r = .18$, $p = .11$). Humanism and normativism accounted for 14.1% of the variance of the factor loadings.

Discussion

The science of personal worldviews is a growing area of research that has recently attracted the attention of personality, social, clinical, cultural, political, and environmental psychologists alike (e.g., DeWitt et al., 2016; Kaler et al., 2008; Koltko-Rivera, 2004; Leung et al., 2002; Nilsson, 2014b; Saucier, 2013). But even though its recent expansion holds great promise, the past research rests almost entirely upon the quantitative analysis of individual differences in questionnaire responses, which—if applied without proper care and thoughtfulness—might lead to misrepresentation and misunderstanding of the subjective worlds of individuals. Therefore, the current study investigated personal worldviews through Q-methodology, which is designed specifically to capture human subjectivity. Although this methodology uses quantification, it does so only to generate holistic points of view that are interpreted qualitatively—that is, quantification is recruited in the interest of revealing rather than eliminating subjectivity. Furthermore, the understanding of worldviews produced by Q-methodology was used to evaluate polarity theory (Tomkins, 1963, 1965, 1987), which is one of the most ambitious integrative accounts in the psychological literature of how and why different components of worldviews cohere. The study thereby yielded new insights both about the psychological study of worldviews *per se* and about polarity theory.

New insights about the study of worldviews

One of the weaknesses of the traditional variable-oriented approach is that it is based on the assumption that the meanings of questionnaire items are invariant across participants (and sometimes across cultural contexts). In Q-methodology, on the other hand, the meanings of the materials that are sorted are interpreted on the basis of their embedment within a subjective viewpoint. This might be particularly helpful in the study of worldviews, because statements about worldview issues are, by their very nature, general, abstract, and therefore open to multiple interpretations. Their meanings may be concealed or obscured by a more traditional approach. Most notably, ontological and epistemological terms such as 'relativism', 'objective', 'subjective', and 'real' are notoriously polysemous and slippery—at the same time, such terms can undoubtedly play an important *psychological* role in a person's worldview. It is therefore not surprising that it was the statements that ostensibly address metaphysical issues that appeared to

be the most subject to multiple meanings in this study. For instance, the rejection of statements that express scientific reductionism could reflect a range of viewpoints, including spiritualism and postmodernism, and the endorsement of statements about mind constructing reality could reflect anything from ontological idealism or epistemological constructivism to a belief in the existence of free will or a general sense of optimism about the capacities of human beings.

Another limitation of the traditional study of individual differences between persons is that inferences about what a person is like in absolute terms are not warranted on the basis of that person's relative position on a particular variable compared to other persons (Lamiell, 1987). Q-methodology provides a better understanding of the actual concerns and priorities within each worldview, because it treats the entire configuration of statements that the participant him-/herself has compared and sorted, rather than disparate statements or variables, as the basis of inter-individual comparison. For instance, although the individual differences approach would suggest that some individuals have a more selfish outlook on life than others, all of the actual worldviews that did in fact emerge from this study included humanitarian values and attitudes among their priorities. All of the worldviews also incorporated a degree of cynicism about the extent to which people have moral integrity and self-insight, while there was much more variation in views of the goodness or benevolence of human nature in a more general and abstract sense (which might be thought of as a more basic potentiality that is not always fully realized). Furthermore, statements that expressed more concrete claims about what human beings can accomplish were generally endorsed to a greater degree than the more abstract, philosophical claims about free will were, consistent with the past finding that belief about free will and determinism are multidimensional and that many persons are intuitive compatibilists (Nadelhoffer, Shepard, Nahmias, Sripada, & Ross, 2014; Paulhus & Carey, 2011).

A third limitation of the traditional approach is that it does not yield any information about the subjective or psychological significance of different ideas to the participants who are asked to endorse or reject these ideas, because the scores on variables of interest are calculated through a fixed algorithm. By having participants sort statements and select those they agree and disagree with the most, Q-methodology instead reveals their most subjectively felt concerns and the main points of divergence and contestation between worldviews. Interestingly, it was the statements about ontological and epistemological issues that proved to evoke the strongest reactions and the greatest divergence between the worldviews. This finding is extremely important for the psychology of worldviews, because ontological and epistemological beliefs of the kind that were studied here have typically been ignored in past psychological research and deserve much greater attention. Although psychologists have studied beliefs about deter-

minism and free will (e.g., Nadelhoffer et al., 2014; Paulhus & Carey, 2011), as well as religious, spiritual, and superstitious belief (e.g., McDonald, 2000; Tobachyk & Milford, 1983) extensively, studies that address lay beliefs about dualism, the nature of consciousness, and naturalistic reductionism are much rarer, and while research in the field of education studies has studied epistemological beliefs (Duell & Schommer, 2001) neither these studies nor epistemological beliefs in general have attracted much attention in psychological research. Despite the ostensive cognitive sophistication of beliefs about these matters, the few notable studies that have sought to measure them through the years (e.g., Barušs & Moore, 1992; Johnson, Germer, Efran, & Overton, 1988; Nilsson & Strupp-Levitsky, 2016; Preston, Ritter, & Hepler, 2013; Smith, Royce, Ayers, & Jones, 1967; Stanovich, 1989) demonstrate that people do indeed express this sort of beliefs if the statements that are used to elicit them are appropriately formulated.

Views on human nature, on the other hand, which have been amply represented in worldview theory and research (e.g., Janoff-Bulman, 1989; Tomkins, 1963; Wrightsman, 1992), and particularly moral convictions, which have been studied extensively (e.g., Forsyth, 1980; Graham, Haidt, & Nosek, 2009), were lower in terms of subjective significance and divergence between the worldviews. But it is of course possible that these areas would have evoked stronger reactions and more disagreement if the statements that were Q-sorted or the cultural context would have been different. It is also worth noting that the main point of divergence in the moral domain was not between utilitarianism and deontology, as the history of philosophy would seem to suggest, but rather between following rational considerations and principles versus contextual or emotion-based judgment (see also Forsyth, 1980).

New insights about polarity theory

According to polarity theory (Tomkins, 1963, 1965, 1987), the structure of worldviews can be understood in terms of the universal tensions and conflicts between humanistic and normativistic perspectives on the world. The current study showed that the worldviews that emerged from a qualitative and explorative investigation of worldviews did indeed reveal a structure that was, at least in part, interpretable in terms of polarity theory. The largest Q-factor revealed a worldview that fit Tomkins' (1963) theoretical description of the worldview of a prototypical humanist (which is also low in terms of normativism). This worldview incorporated an emphasis on the power of perspectives (albeit neither ontological idealism nor epistemological relativism, which Tomkins ascribed to the *extreme* humanist), a rejection of naturalistic reductionism, an optimistic view of human nature, and the values of openness and ethical self-transcendence.

Furthermore, the analyses revealed that both of the worldviews that were shared by persons who score high on

humanism had an optimistic view of human nature and valued ethical self-transcendence, which suggests that these are core elements of humanism. But while one of the worldviews incorporated openness values, the other incorporated an inauthentic hedonism rather than openness. This finding illuminates the existence of two different kinds of humanism, with different ways of resolving the potential conflict between openness to affect and maximization of positive affect, which Tomkins failed to acknowledge.

Another limitation of polarity theory is that it appears to overestimate the extent to which humanism and normativism are opposed to each other (see also Nilsson & Strupp-Levitsky, 2016) and underestimate the extent to which worldviews tend to combine different elements of humanism and normativism—although Tomkins (1963) mentioned "middle of the road" ideologies, he seems to have viewed them as exceptions to the general rule of polar opposition and did not discuss them at depth (Alexander, 1995). Except for the aforementioned worldview, which was the most prevalent one in this study, all of the worldviews that emerged from the Q-methodological analyses combined elements of humanism and normativism in one way or another. Even the worldviews that were held by those persons who were the most normativistic incorporated elements of humanism.

Furthermore, the majority of the participants who scored high on normativism subscribed to a worldview that, in some regards, deviated from Tomkins' (1963) theoretical description of normativism. Although these participants were *less opposed* to a worldview that incorporated a degree of deference for authority and common sense empiricism than those who scored low on normativism were (as the theory suggests that they should be), the worldview that most of them did in fact have seemed to rather express the sort of critical realism that was popularized by Karl Popper, which incorporates a strong belief in critical rationality both in science and in the moral domain. Both of these worldviews also placed a higher premium on humanistic than normativistic values, although one of them did value accomplishment while the other valued respect, recognition, and decency.

It is possible that these discrepancies between the actual normativists in this study and Tomkins' (1963) theorized normativist reflect historical and cultural contingencies. Over the past decades, common sense empiricism has fallen out of favour in Western countries while critical realism has gained popularity, and values have shifted in the direction of greater humanism and lower normativism (e.g., "self-expression" vs. "survival" values) throughout most of the world (Inglehart & Welzel, 2010). Considering the fact that this study was conducted in one of the most humanistic and least normativistic settings in the world, at perhaps the most humanistic and least normativistic point in human history, it is not surprising that all of the worldviews that emerged incorporated humanistic ideas. On the other hand, Thomas (1976) found, already more than four decades ago,

that the normativists he studied in the United States were less punitive and rigid that polarity theory would suggest. It is, in other words, possible that Tomkins' (1963) theoretical description of normativism was biased already from the outset. According to Alexander (1995, p. 105), Tomkins "preferred" the humanistic position and was "plagued by" the normativistic one, although he did to some extent resonate with both positions and struggled with their incompatibility.

At any rate, a distinction between common sense empiricist and critical realist forms of normativism, similar to the distinction between a hedonistic form of humanism and one that prescribes openness, is a useful addition to polarity theory. Furthermore, this study illuminates the differences between atheistic and religious forms of normativism. While research in the United States has identified a type of normativism concerned with following religious rules and scriptures (de St. Aubin, 1996, 1999), the current study, which was conducted in a highly secular context, identified an atheistic form of normativism that embraces scientific naturalism. Both atheistic and religious forms of normativism embrace external realism—their disagreement concerns the nature of the external world.

Finally, it is important to note that not all of the viewpoints that emerged in this study could be understood in terms of the opposition or combination of elements of humanism and normativism. Most notably, a postmodern worldview appears to involve a rejection of universal epistemological and moral principles regardless of whether these are humanistic or normativistic (possibly with the exception of the humanistic imperative to rely on your subjective intuitions, feelings, and convictions), and Tomkins did not acknowledge this possibility. The persons who subscribed to a postmodern viewpoint in this study were indeed neither humanistic nor normativistic. Although postmodernism is a comparably recent movement that had not fully made its breakthrough when polarity theory was first introduced, the attraction to nihilism and relativism has existed throughout human history, as exemplified by the philosophy of Protagoras in the ancient world, the writings of Nietzsche in the 19th century, and the Dadaist movement in aesthetics of the early 20th century.

Limitations and future directions

One of the limitations of this study is that the sampling of the statements that the participants Q-sorted and the qualitative interpretations of the Q-factors were constrained by the researcher's evolving and culturally circumscribed understanding of worldviews in the local context at the time of the study. Although the reliance upon the researcher's subjective judgments and interpretations (as opposed to a standard paradigm) may have enabled the production of truly novel insight, which is particularly helpful in a relatively uncharted research area, it also comes with important drawbacks. In retrospect, the selection and formulation of

the statements could have been improved. For instance, because some of the statements were quite complex, their meaning was not always clear when they were placed near the centre point of the distribution. Moreover, some worldview domains, such as beliefs in a just, dangerous, stable, or orderly world, were not taken into consideration. This study does, in other words, represent a first attempt to apply a promising person-oriented methodology to the study of worldviews, and to thereby illustrate its potential contributions, rather than a comprehensive survey of worldviews. The findings should be considered tentative.

Another limitation is that the prevalence of the worldviews that it uncovered cannot be inferred from the results; nor is this the goal of Q-methodological research. Rather, the study provided examples, illustrations, and in-depth understanding of what appear to be important themes of worldviews in at least *some* contexts, and counterexamples to theoretical claims about the universal structure of worldviews. The case of Sweden may be particularly interesting insofar as it provides us a glimpse of the potential future of humanity, because most countries seem to be heading in the direction of Sweden, at least in terms of values (Inglehart & Welzel, 2010). But it tells us little about worldviews in, for example, Bangladesh, Tanzania, or Lebanon. In addition to this, Q-methodological research that is more focused on thick description of lived experiences and cultural forms of life might yield even more new insight about worldviews. One possibility would be to interpret each individual's Q-sort qualitatively before any attempt to generalize is made, consistent with a subject-specific focus in person-oriented research (Molenaar & Campbell, 2009; Sterba & Bauer, 2010) and personality theory (Lamiell, 1987).

Yet another limitation of Q-methodology in general is that it has undergone relatively little methodological scrutiny and refinement over the years, and is today still practised in much the same way as when it was first introduced, in spite of the evolution of new, increasingly sophisticated research techniques in other areas (Akhtar-Danesh, 2016; Zabala & Pascual, 2016). This could be contrasted with modern person-oriented research, which is much more focused on statistical issues, measurement, and methodological innovation (e.g., Bergman & Magnusson, 1997; Sterba & Bauer, 2010). In spite of the striking points of convergence between Q-methodology and modern person-oriented research, the research literatures of these two approaches remain largely isolated from each other to this day. Q-methodology has a longer history and is widespread across the social and health sciences, while modern person-oriented research is largely concentrated to psychology. Yet, there is great potential for cross-fertilization. Modern person-oriented research could quite possibly help to refine and enrich Q-methodology and thereby make it an even more powerful tool for investigating human subjectivity. Conversely, Q-methodology might help to broaden the field of person-oriented research so that it can better take the

whole person into account. Further work that compares Q-methodology to other person-oriented methods and situates it within the person-oriented approach more broadly would therefore be extremely useful.

All of its limitations notwithstanding, the insight that the current study produced illustrates the contribution that Q-methodology could make to the evolving science of personal worldviews (it has, in fact, already inspired further research; Nilsson & Strupp-Levitsky, 2016). Above all, Q-methodology unveils subjective meanings, structures *within* personal worldviews, and psychologically significant concerns that define and divide worldviews, thereby generating novel ideas that could be subjected to empirical test, while using quantification to assuage confirmation bias. Further studies could subject leading taxonomies and measures of worldview elements to Q-methodological scrutiny and compare the extent to which individual difference scores on worldview scales and Q-factor loadings derived through Q-methodology predict how individual lives unfold. This kind of research could serve as a corrective to the understandings of personal worldviews produced by the traditional quantitative approach, by helping us to make sure that we do not mischaracterize or oversimplify a person's subjective experiences of the world.

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