International Journal of Behavioral Development
2001, 25 (5), 401–415
http://www.tandf.co.uk/journals/pp/01650254.html

DOI: 10.1080/01650250042000519

Do advanced moral reasoners also show wisdom? Linking moral reasoning and wisdom-related knowledge and judgement

M. Pasupathi and U.M. Staudinger
Max Planck Institute for Human Development, Berlin, Germany

Wisdom and morality are both discussed as developmental ideals. They are often associated in theoretical contexts but the nature of their empirical relation is still an open question. We hypothesised that moral reasoning (one facet of morality), would be related to wisdom-related knowledge and judgement, but that the two represent different facets of high level psychological functioning. A sample of 220 adults ranging in age from 20 to 87 years completed measures of wisdom-related performance, moral reasoning, and a battery of cognitive and personality measures. As predicted, moral reasoning was positively associated with wisdom-related performance, although we also found evidence for divergent validity of these two constructs. This association was mediated by person characteristics (e.g., personality, intelligence, and additional measures). In addition, as predicted by a threshold model, very high levels of wisdom-related performance were unlikely among those with very low moral reasoning performance. In line with neo-Piagetian conceptions, exploratory analyses suggested that higher age was associated with higher levels of wisdom-related knowledge and judgement only for those with high levels of moral reasoning. Results are discussed in terms of a lifespan model of wisdom-related knowledge and judgement.

Recent publications have called for the furthering of moral and ethical reasoning and of wise thinking as an antidote to societal and individual ills (e.g., Almond, 1997; Colby & Damon, 1992; Kekes, 1995; Rest & Narvaez, 1994; Sternberg, 1998). Theoretically, the mutual interdependencies of wisdom and moral reasoning have been thoroughly discussed. Lay conceptions (i.e., implicit theories) of wisdom certainly suggest that a wise person also displays advanced moral reasoning. People describe wise people as humane, fair, and moral, but also as intelligent, introspective, understanding, experienced, curious, and knowledgeable (Clayton & Birren, 1980; Holliday & Chandler, 1986; Orwoll & Perlmutter, 1990; Sternberg, 1986). Conversely, the highly moral person is also described as wise, but qualities like honesty, principled thinking, sincerity, loyalty, and trustworthiness are considered more prototypical of highly moral people than is wisdom (Walker & Pitts, 1998). Despite the common-sense view that those who are moral may also be wise, and vice versa, this relationship has received almost no empirical research attention. The goal of this paper is to examine whether moral reasoning predicts wisdom-related knowledge and judgement. Our hypotheses are grounded in the conceptual and empirical literature on morality and wisdom, to which we turn next.

Philosophical and conceptual perspectives on morality and wisdom

Aristotle argued that "... it is not possible to be good in the strict sense without practical wisdom, nor practically wise without moral virtue" (*Nicomachean Ethics*, cited in Almond 1997, p. 421). Kant viewed wisdom as having both intellectual and moral aspects, and argued that the ultimate task of wisdom was to seek the good (*Critique of Practical Reason*, I, 1, after Baltes & Staudinger, in press). Although there are several philosophical views of relations between wisdom and morality, a common one is that wisdom provides insight and judgement about difficult and uncertain matters of life. Such insight includes reasoning and judgement relevant to taking moral actions, but is not limited to only moral concerns (Assmann, 1994; Baltes & Staudinger, in press; Csikszentmihalyi & Rathunde, 1990; see types of wisdom in Kekes, 1995). Put differently, principled or advanced moral reasoning may be a necessary but not sufficient condition for wisdom to arise. This view is also consistent with psychological conceptions of wisdom and morality.

Psychological approaches to wisdom. Conceptions of wisdom in psychology stem from four perspectives: the implicit

Monisha Pasupathi is now at the University of Utah and Ursula M. Staudinger is now at the Dresden Institute of Technology. Correspondence should be addressed to Monisha Pasupathi at the Department of Psychology, University of Utah, Salt Lake City, UT, 84112, USA *or* to Ursula Staudinger at Department of Psychology, Dresden University of Technology, 01062 Dresden, Germany; e-mail: Pasupathi@freud.sbs.utah.edu *or* Staudinger@psy1.psych.tu-dresden.de.

The data reported here were collected within the project "Wisdom and Life-Span Development" at the Max Planck Institute for Human Development, co-directed by Paul B. Baltes and Ursula M. Staudinger. Monisha Pasupathi was supported during preparation of this article by a Max Planck post-doctoral fellowship. Susanne Böhmig-Krumhaar, Marcel Braß, Simone Elsing, Gabi Faust, Claudia v. Grothe, Kerstin Haenel, Irmgard Pahl, and Gisela Schubert assisted in various stages of data collection and organisation. We thank Susan Bluck, Markus Brediendiek, and Anne Colby for helpful comments on earlier drafts.

approach reviewed above, and three explicit approaches, in which wisdom is operationally defined and assessed at the individual or behavioural level (Pasupathi & Baltes, 2000; Staudinger & Baltes, 1994). All three explicit approaches, one relating wisdom to personality development, one to post-formal cognitive development, and one to expertise development, support a view of morality as one feature of wisdom.

Personality-based approaches view the developmental tasks of middle and old age as leaving something behind for future generations, and coming to terms with one's life as lived (Erikson, 1959). The latter involves consolidating "a sense of lifelong wisdom and perspective" (Erikson, Erikson, & Kivnick, 1986, p. 72). These tasks involve the acceptance of moral obligations towards future generations and towards oneself, in the sense of self-acceptance and forgiveness. Thus, the Eriksonian notion of wisdom is based in part on morality. Post-formal approaches define wisdom as "encompass[ing] such issues as moral and ethical understanding [but also] understanding one's own emotions and inner life and differentiating them from those of others, and using such understanding ... in striving for a rational attitude that unites ... objective validation with ... subjective significance (Labouvie-Vief, 1990, p. 78; see also Pascual-Leone, 1990).

In our own work we regard wisdom as expert knowledge and judgement about difficult and uncertain matters of life, employed for the good of self and others (Baltes, Smith, & Staudinger, 1992; Baltes & Staudinger, 2000). We typically assess this kind of knowledge and judgement by asking people to think aloud about difficult, fundamental life problems (see, e.g., Baltes & Staudinger, 2000; Staudinger, 1999). We reserve the term "wisdom" for peak levels of expertise, and refer to less-than-expert levels of knowledge and judgement as wisdom-related.

In our view, wisdom-related knowledge and judgement is characterised by a family of five criteria, presented in Table 1. These criteria make it possible to evaluate an individual's knowledge and judgement, as demonstrated in their responses to wisdom-related dilemmas. The two basic criteria, rich factual and rich procedural knowledge about life, stem from the notion of wisdom as expertise (in the widest sense). However, they do not fully characterise wise knowledge and judgement. The latter three criteria, grounded in the historical wisdom literature, neo-Piagetian research on post-formal thinking, and aspects of lifespan psychology (see Baltes et al., 1992), are more specific to wisdom than to other areas of expertise. Part of expert knowledge and judgement about life is knowing about conditions of lifespan contexts, which may partly function to constrain the applicability of facts and procedures. Wise knowledge and judgement also acknowledges variation in values, but retains a small set of universal standards oriented towards benefiting oneself and others. Finally, such knowledge and judgement involves recognising uncertainty in what is known about past, present, and future, as well as seeing ways of managing that uncertainty. This conception also suggests relationships to moral reasoning. Most clearly, we conceive of wisdom as something employed for the good of the self and of others; thus, ethics enters into the core of applying wisdom-related knowledge and judgement. This is most clearly expressed in two of the five criteria: value-relativism and lifespan contextualism. Those two criteria imply that principled moral reasoning is one important antecedent/correlate of wisdom.

In sum, explicit conceptions of wisdom suggest that morality and wisdom are related. Two possibilities arise from these literatures. One is a linear relationship, in which wisdom-related performance and moral reasoning performance are moderately and positively associated. Another, based on notions of morality as a necessary but not sufficient aspect of wisdom, is a threshold model, in which peak levels of wisdom-related performance should not be possible without some (unspecified) level of moral reasoning capacity. These two possibilities are not mutually exclusive.

Psychological theories of morality. Theories of moral reasoning are less likely to mention wisdom. In the present paper we focus on reasoning about moral dilemmas, an aspect of moral development that offers a clear theoretical tradition, established findings, and the closest link to the operationalisation of wisdom that we employ in our own work (i.e., a focus on judgement as opposed to action). For a broader approach to morality and development, we recommend comprehensive reviews by Rest (1983) and Turiel (1998).

Psychological approaches to moral reasoning have generally

Table 1
Wisdom criteria (after Baltes et al., 1992)

Basic criteria	*High performances are exemplified by:*
Rich factual knowledge about life	Consideration of general (human condition) and specific (e.g., life events, institutions) features of life matters as well as scope and depth in coverage of issues.
Rich procedural knowledge about life	Consideration of decision strategies, goal selection, choosing means to achieve goals, people to consult with, as well as strategies of advice-giving.
Metalevel criteria	*High performances are exemplified by:*
Lifespan contextualism	Consideration of past, current, and possible future life contexts and the circumstances in which a life is embedded.
Value relativism	Consideration of variations in values and life priorities and the importance of viewing each person within an individual framework, but also the importance of a small set of universal values oriented towards the good of others and oneself.
Awareness and management of uncertainty	Consideration of the inherent uncertainty of life (in terms of interpreting the past and predicting the future) and effective strategies for dealing with uncertainty.

been dominated by the work of Kohlberg (e.g., 1973; Colby & Kohlberg, 1987). For Kohlberg and his followers, post-conventional (or principled; Rest, 1983) moral reasoning is the pinnacle of moral reasoning development (Colby & Kohlberg, 1987; Kohlberg, 1973; Rest, 1983). Such reasoning is complex and abstract, concerns human problems, implicitly emphasises uncertainty in determining the priority of competing moral claims, and requires individuals to acknowledge multiple perspectives but arrive at a decision for, or evaluation of, one action (Kohlberg, 1973; Rest, 1983). Although the particular abstract principles used in moral reasoning may be care oriented rather than justice oriented (e.g., Gilligan, 1982), the idea of increasing complexity and maturity is common to many perspectives. These characteristics share similarities with the definitions of wisdom reviewed above.

Why moral reasoning and wisdom are not the same

Despite conceptual overlap between moral reasoning and wisdom-related knowledge and judgement, there is reason to believe that relationships between these two characteristics would be moderate. First, moral reasoning is more limited in scope than wisdom. Moral values like justice or fairness represent only one way to view difficult and uncertain situations (Colby, Kohlberg, Gibbs, & Lieberman, 1983; Rest, 1983), and the most critical features of many problem situations may be practical or factual rather than moral (Colby et al., 1983). Thus, substantial variability in wisdom-related performance would be independent of individual differences in moral reasoning capacity. A second important divergence is that Kohlberg's stage model posits the transcendence of conventional value systems in order to attain higher levels of moral reasoning. In contrast, high levels of wisdom-related performance can be associated with the endorsement of a conventional value if it fits the dilemma at hand. High-level wisdom-related judgement is always dependent on the task at hand and is not characterised by the invariant application of abstract principles of justice and fairness.

In sum, conceptions of both developmental ideals, peak moral reasoning and wisdom, imply that moral reasoning and wisdom-related knowledge and judgement may be related, but are also distinct. As we see below, the empirical evidence, though sparse and indirect, also suggests relation, but not equivalence.

Empirical evidence for relations between morality and wisdom

Empirical evidence that principled moral reasoning is associated with higher levels of wisdom-related knowledge and judgement is largely indirect and takes two forms. First, the two performances show similar developmental trajectories. This similarity could be due to a relationship between them, or to a shared dependence on other developing features of the individual (e.g., personality, intellectual ability, cognitive style). Second, the types of people who reason well about moral issues share some common features with those who display high levels of wisdom-related knowledge and judgement.

Becoming wise and/or developing advanced moral reasoning ability. Peak or "wise" responses to difficult life dilemmas are rare, and wisdom-related performance is generally uncorrelated with age across adulthood (Smith & Baltes, 1990; Staudinger, 1999). Some researchers observe declines in post-formal reasoning during later adulthood (Labouvie-Vief, Hakim-Larson, & Hobart, 1987), and there is some preliminary evidence that wisdom-related performance may also decline in very late life (e.g., over age 80; Baltes, Staudinger, Maercker, & Smith, 1995). During adolescence, wisdom-related knowledge and judgement shows major age-related increases (Pasupathi, Staudinger, & Baltes, 2000).

Moral reasoning development has been theorised to take place in stages. Early stages are characterised by concerns with punishment or reward (Kohlbergian stages 1 and 2 or pre-conventional), intermediate stages focus on norms and rules (stages 3 and 4 or conventional), and more advanced stages are characterised by the use of abstract principles, employed independently of current societal rules or regulations, to determine the most moral course of action in difficult situations (stages 5 and 6 or post-conventional; Colby & Kohlberg, 1987; Kohlberg, 1973; Rest, 1983). Although people typically proceed through lower stages before attaining higher levels of reasoning, few people reach the highest stages and reason predominantly using abstract principles of justice or fairness (see, e.g. Colby et al., 1983; Kohlberg, 1973; Lind, 1983; Pratt, Diessner, Pratt, Hunsberger, & Pancer, 1996; Pratt, Pancer, Hunsberger, & Manchester, 1990; Rest, Thoma, & Edwards, 1997a). Moral reasoning performance shows steep increases in adolescence and is largely stable in adulthood, with some studies showing small declines in later life (Pratt et al., 1990, 1996; Rest, 1983).

If it isn't age, what is it? Although age may not automatically be the bringer of wisdom or advanced moral reasoning, other characteristics are associated with both performances. Our own developmental model for wisdom-related knowledge and judgement, depicted in Figure 1, implies that a complex set of factors is required for people to become wise, and that there are multiple "paths" to wisdom. Correlational evidence from adult samples supports this model. For example, those who are open to new experiences, are creative, who think about the how and why of an event rather than simply whether it is good or bad, who demonstrate more social intelligence, or who are oriented towards personal growth display higher levels of wisdom-related knowledge and judgement (Staudinger, Lopez, & Baltes, 1997; Staudinger, Maciel, Smith, & Baltes, 1998). Those who specialise in professions which provide extensive training and practice in difficult and uncertain life matters, such as clinical psychology, show higher wisdom-related performances (Smith, Staudinger, & Baltes, 1994; Staudinger, Smith, & Baltes, 1992; Staudinger et al., 1998). Finally, intellectual ability does play some role in wisdom-related performance. Very low levels of intellectual ability may be related to lower performance, but given a minimum level of intellectual functioning, this relationship is not important (Baltes et al., 1995; Staudinger, 1999).

Looking at correlates of moral reasoning yields a remarkably similar picture. Intelligence functions as a necessary but not sufficient precondition for high levels of moral reasoning (Colby et al., 1983; Kuhn, Langer, Kohlberg, & Haan, 1977; Rest, Turiel, & Kohlberg, 1969; Stewart & Pascual-Leone, 1992). Social intelligence, particularly perspective-taking ability, is also central for moral reasoning (Kohlberg, 1973;

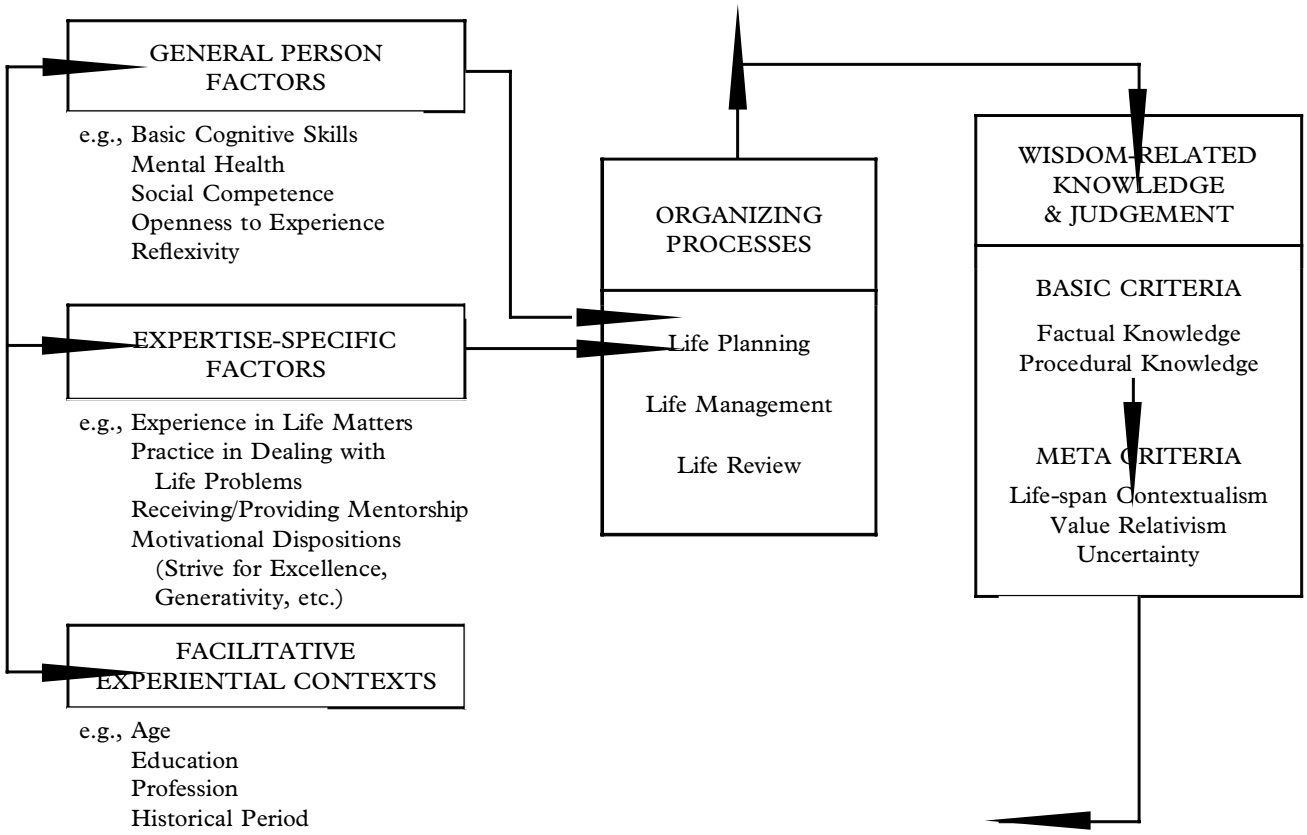

Figure 1. Ontogenetic model of wisdom-related knowledge and judgement.

Piaget, 1932; Pratt et al., 1990; Selman, 1971). Further, a ten-year longitudinal study depicts those who improve in moral judgement over time as "those who love to learn, who seek new challenges, who make plans and set goals, who take risks, who see themselves in the larger contexts . . . who take responsibility for themselves . . ." (Rest, 1986; p. 57). These qualities sound like openness to experience, creativity, and thinking reflectively about life situations. People who acquire high levels of moral reasoning are thus described very similarly to those who display high levels of wisdom-related knowledge and judgement (see, e.g., Staudinger et al., 1997, 1998).

Moral reasoning as a factor in the development of wisdom? Our ontogenetic model of wisdom implies that people with particular ways of acting and reacting to the world (as captured by cognitive styles and personality characteristics like openness to experience or creativity) are more likely to have particular experiences, evaluate their experiences in a certain fashion, and thus are more likely to develop and refine their knowledge about difficult matters of life. Advanced moral reasoning might also represent a way of thinking, ordered around justice and fairness, that actually facilitates this process of knowledge acquisition and integration. Engaging in principled moral reasoning may in fact promote the kind of reflection and evaluation that allows people to gain insight from experience. In a cross-sectional dataset, this assumption would be reflected in finding that for individuals with high levels of moral reasoning, wisdom-related performance might show increases with age.

Summary and hypotheses

The consensus in the theoretical and empirical literature is clear, but direct evidence relating moral reasoning and wisdom is lacking. This literature leads us to two hypotheses. First, moral reasoning will be a predictor of wisdom-related performance. This relationship could be linear and/or could follow a threshold function (i.e., a certain level of moral reasoning is necessary for high levels of wisdom-related performance). However, in keeping with the general literature on personality and individual difference constructs, and consistent with the literature above, which suggests that these two capacities are related but not equivalent, we do not expect the relationship to be large.

Second, because people who show high levels of moral reasoning appear to share many characteristics with those who show high levels of wisdom-related performance, we expect that a relationship between wisdom-related performance and moral reasoning may not be unique. Rather, the relationship might be due to person characteristics like personality, cognitive styles, and intellectual ability that contribute to the development of both characteristics. In particular, person characteristics previously shown to predict wisdom-related performance were of interest (Staudinger et al., 1997). Below we present the results of a study testing these hypotheses in a large and heterogeneous sample of German adults. In addition, we explored whether wisdom and age were differently related at different levels of moral reasoning to gain a first glimpse at whether moral reasoning might play a role in the acquisition of wisdom-related knowledge and judgement.

Method

Participants

Participants were recruited with the assistance of a survey research company in order to achieve a heterogeneous sample. The 220 participants ranged in age from 20 to 87, with an average of 45 (SD = 16 years). Approximately one-third were between 20 and 35, one-third between 35 and 50, and the remaining third were over 50. All were German, and 41% were female. They had an average of 12 (SD = 3) years of education, with a range from 8 to 16 years.[1] Thirty per cent worked full-time, 25% were retired, 19% were either students or in vocational training, 14% worked part-time, 3% were homemakers, and 9% were unemployed. The employment of the participants ranged from owners of small businesses and self-employed professionals (6%) to blue-collar workers (15%), with the largest proportion employed in mid level white-collar jobs (38%). Thus, the sample was quite heterogeneous in terms of occupational training, age, gender, and current employment status.

Measures

Wisdom-related performance. Wisdom was assessed according to the Berlin Wisdom Paradigm (for procedural details see Staudinger, Smith, & Baltes, 1994). Participants were asked to think aloud about a series of difficult life situations faced by hypothetical people. The procedure involved a training portion, in which participants received practice in thinking out loud (Ericsson & Simon, 1984), and practice in problems involving hypothetical people. Following the training, participants were presented with the wisdom tasks one at a time and asked to think aloud in response to them. The three tasks used in the present study are shown in Table 2. All three tasks have been used in earlier studies (suicide: Maercker, Böhmig-Krumhaar, & Staudinger, 1998; meaning of life and family problems: Staudinger & Baltes, 1996). Responses to these dilemmas were transcribed and evaluated by a panel of ten expert raters, specially selected and trained to evaluate the degree to which a think-aloud protocol matches an ideal (wise) response to the task (Staudinger et al., 1994). Raters received ideal, average, and poor responses during training. Each rater evaluated the protocols according to a single wisdom criterion, giving the protocol a score between 1 and 7, where a score of 7 indicates a close match to an ideal protocol for that criterion, and a score of 1 a poor match to the ideal. Protocols were evaluated in a random order. Two raters were randomly assigned to one criterion. Cronbach's alpha across the five criterion scales and the three tasks was .94 (Cronbach's alphas for a single task or a single criterion ranged from .75 to .92). The resulting ratings were collapsed to create a single wisdom score for each participant (see, e.g., Staudinger et al., 1997).

Moral reasoning. Participants also completed a paper-and-pencil measure of moral reasoning, the Moral Judgment Test (MJT) designed by Lind (1978, 1983, 1985).[2] The MJT, a German-language measure based on Kohlbergian theory, asks participants to respond to two stories, one involving work and the other health. Each story presents a moral dilemma and the actions taken by the main character(s) in solving the dilemma. Respondents were first asked whether they think the action taken was the right one, after which they review six arguments supporting, and six arguments condemning this action. Two arguments, one pro and one con, are presented for each Kohlbergian moral reasoning stage. Participants were asked to evaluate the acceptability of each of the 12 arguments in justifying or condemning the action described on a 9-point scale, where 1 corresponded to a rating of unacceptable and 9 a rating of very acceptable. Appendix A provides a more detailed illustration for one dilemma.

Table 2
Assessing wisdom-related performance: Tasks employed in the present study

Suicide task (Existential life management) Somebody gets a phone call from a good friend who says that he/she can't go on anymore, that he/she has decided to commit suicide. What could one do or consider?
Meaning of life task (Life review) In reflecting over their lives, people sometimes realise that they have not achieved what they had once planned to achieve. What could one do or consider?
Family task (Life planning) A 14-year-old girl absolutely wants to move out of her family home immediately. What could one do or consider?

Lind and Wakenhut (1980) advocate the use of two measures: (1) a preference measure, in which participants' ratings of the arguments are summed within stages, and the stage receiving the highest ratings is assigned; and (2) a consistency measure based on within-subjects analysis of variance, which indicates the degree to which participants' ratings are influenced by the stage-rank of the arguments.

There are some measurement problems with these indices that have been discussed in the literature (see Rest et al., 1997a). One is that by assigning a categorical stage score based on differences in quantitative ratings means that some people receiving a stage 5 score only differ by a single point from people receiving a stage 4 score. Another issue concerns the importance of having both information about preferences, and the consistency with which preferences are held (Colby et al., 1987; Rest et al., 1997). Other questionnaires measuring moral reasoning, as well as the more recent methods for scoring the interview, employ indices which combine preference and consistency information (see Colby et al., 1987; Rest et al., 1997). Based on these problems, we sought an alternative scoring method to the ones recommended by Lind.

Recent work on the Defining Issues Test, a measure similar to the MJT promoted a new scoring method (the N2 indicator) that showed the expected developmental pattern in moral reasoning and expected patterns of correlation with other measures (Rest et al., 1997a,b). The N2 score is computed to take into account participants' preferences for higher stage (5 and 6) items, and penalises them for the degree to which they fail to differentiate between these and lower stage items. However, computing the N2 index requires both ranking of statements and rating of statements, and the MJT does not

[1] Mandatory school attendance in Germany is eight years.

[2] Due to pragmatic research constraints (i.e., time and money), we were not able to apply Kohlberg's original moral reasoning interview in addition to our wisdom interview procedure. The Lind measure was the only German version of a moral reasoning questionnaire known to us. Translating existing American questionnaires did not seem advisable as cross-cultural differences (semantic, conceptual) take on special relevance with regard to moral reasoning.

provide ranking data. The interview measure (Colby & Kohlberg, 1987) is scored by weighting the stages represented in an interview response by the number and type of issues at each stage, raised by a participant; thus, the overall weighted average assigns a score based on both which stage is the most typical for a participant, and on the degree to which that stage is most typical. Thus, we computed a moral reasoning score for the MJT by summing the acceptability ratings given to stage 5 and 6 reasons (principled reasons) and dividing (weighting) them by the sum of acceptability ratings given to stages 1 to 4. Doing so yields a measure which can range from .06 (minimum possible endorsement of stage 5 and 6 reasons and maximum endorsement of reasons at stages 1 through 4), to 4.5 (maximum endorsement of stage 5 and 6 reasons and minimum endorsement of stage 1 through 4 reasons). A score of .50 would mean that a participant gave equal ratings to principled reasons (stages 5 and 6) and to stages 1 through 4 reasons. Scores above .5 represent the point at which people begin exhibiting a preference, however small, for higher stage items over lower stage items. The resulting score correlates .38 ($p < .01$) with Lind's advocated measure of preference, and .70 ($p < .01$) with Lind's advocated measure of consistency. Thus, our score indicates both the degree to which participants preferred principled stages of moral reasoning and the consistency with which they held that preference. Computing this measure separately for each of the two problems on the MJT allows the computation of a split-half reliability; the Cronbach's alpha in this case was .59. This is in the lower range of satisfactory for an alpha based on two numbers, and suggests that our measure represents something consistent about participants' approach to moral problems. The lower correlation with Lind's preference measure is likely a result of the categorical scaling issue mentioned above.[3]

Measures of person characteristics. Additionally, participants were assessed for facets of: (i) intellectual functioning; (ii) personality; and (iii) measures reflecting both personality and intellectual ability, which we refer to as "interface" measures. We selected several measures within each of these larger classes of predictors, based on predictors identified in a prior study (Staudinger et al., 1997).

(i) *Intellectual functioning.* Fluid/mechanics intellectual functioning was assessed using a shortened version of Raven's Progressive Matrices (Baltes, Kliegl, & Dittmann-Kohli, 1988; Raven, 1971), which is a nonverbal measure of analogical reasoning ability. Crystallised/pragmatics intellectual functioning was assessed using the vocabulary subtest of the WAIS (scoring by two raters: 82% agreement; $K = .75$) and a practical knowledge questionnaire similar to the practical knowledge subtest of the HAWIE (scoring by two raters: 99% agreement, $K = 1.0$; Lindenberger, Mayr, & Kliegl, 1993; Wechsler, 1982).

(ii) *Personality.* Neuroticism ($\alpha = .85$), extraversion ($\alpha = .74$), openness to experience ($\alpha = .77$), conscientiousness ($\alpha = .82$), and agreeableness ($\alpha = .69$) were assessed using the short form of the NEO personality inventory, which requires participants to rate the degree to which behavioural descriptions fit them with a 5-point likert-type scale (NEO-FFI; Borkenau & Ostendorf, 1989; Costa & McCrae, 1985). Psychological mindedness ($\alpha = .44$), or an orientation to think about situations psychologically, was assessed with 22 items from the California Psychological Inventory which asks participants to make yes or no judgements about whether a description applies to them (Gough, 1964; Weinert, Streufert, & Hall, 1982).

(iii) *Interface measures.* Creativity was assessed using subtests of the Torrance creativity tests that ask participants to generate multiple potential consequences of an imaginary scenario, to make as many new drawings out of a given stimulus as possible, or to come up with as many possible titles for a given, simple picture (Torrance, 1974). Responses are scored for fluency, flexibility, and originality by independent coders. Inter-rater reliability, assessed with correlations, ranged from .72 to .97. Factor analysis of the subscores indicated that a single underlying factor could be identified on which all subscales showed substantial loadings (eigenvalue 4.5, 46% of the variance accounted for); thus, we averaged across subscores to arrive at a single creativity measure.

Finally, thirteen thinking styles were assessed using a 104-item German translation of a measure developed by Sternberg (Sternberg, 1988, 1994). This measure requires participants to endorse descriptive statements about the ways they prefer to employ their abilities in everyday life using a 5-point Likert-type scale. Each style is characterised by eight items. The styles are (briefly described): legislative (preferences for creating, formulating, or planning; $\alpha = .74$); executive (preferences for carrying out plans; $\alpha = .80$), judicial (a preference for evaluation and analysis, $\alpha = .59$), global (a preference for general or abstract tasks; $\alpha = .72$), local (a preference for details of tasks; $\alpha = .60$), progressive (a preference for change and innovation; $\alpha = .87$), conservative (a preference for the tried and true; $\alpha = .87$), hierarchical (a preference for structuring goals hierarchically, $\alpha = .74$), monarchic (a preference for doing one thing at a time, $\alpha = .56$), oligarchic (a preference for juggling multiple competing goals; $\alpha = .79$), anarchic (a style with little clarity or awareness of goals; $\alpha = .44$), internal (a preference for working in isolation; $\alpha = .79$), and external (a preference for working with others; $\alpha = .84$).

Procedure

Participants took part in approximately six questionnaire and/or interview sessions at the Max Planck Institute for Human Development. The two-hour sessions were distributed over a period of approximately four months, with at least one week between sessions in most cases. Participants were reimbursed for participation in the entire study with 75 DM (approximately $45 at the time). In the first session, participants completed the Berlin Wisdom Interview, as described above. In addition, at the end of the first session, measures of fluid intellectual functioning, vocabulary, and creativity were administered. In session IV, the test of practical knowledge, the Sternberg Thinking Styles questionnaire, the psychological-mindedness questionnaire, the Moral Judgment Test, and the NEO-FFI were administered in this sequence. Additional data

[3] Some readers may rightly view a ratio score as suspect. Scores weighting Lind's preference measure by Lind's consistency measure yield similar findings (e.g., yielding a product), as did weighting Lind's preference measure by the ratio of preferences for the preferred stage to preferences for all other stages, or weighting Lind's preference measure by the difference between the ratings assigned the preferred stage and the average of preference ratings across other stages. That all these varying methods of scoring yield similar findings is encouraging. We selected the measure we did employ because it showed the highest correlations with Lind's advocated preference measure.

were collected in the other sessions that were not employed for the present study.

Results

In reporting results, we focus on the two hypotheses and exploratory question from above. First, to test whether and how moral reasoning and wisdom-related performance were related, we describe the simple zero-order correlation between moral reasoning level and wisdom-related performance, and examine our threshold model by using χ^2 tests. Second, we examined whether the association between wisdom-related performance and moral reasoning was unique, or whether it was best explained by a third set of variables. Correlational, regression, and commonality analyses were used to analyse whether the variance in wisdom-related scores predicted by moral reasoning performance was unique to moral reasoning, or shared with other predictors. Finally, we explored whether the relation between age and wisdom-related performance differed depending on levels of moral reasoning, again employing regression-based techniques.

Relations between morality and wisdom

We first examined the linear relationship between wisdom-related performance and moral reasoning. As predicted, the degree to which participants demonstrated high level moral reasoning and the level of their wisdom-related performance were significantly, but not overwhelmingly, correlated in our sample ($r = .29$; $p < .01$). Considering the reliabilities of the two measures (.95 for wisdom-related performance and .59 for moral reasoning), the attenuated correlation would be somewhat larger. There were no nonlinear (e.g., quadratic or cubic) relations between moral reasoning and wisdom-related performance. Participants attained an average wisdom-related performance score of 3.9 (SD = 1.0, range = 1.4–6.5), and an average moral reasoning score of .69 (SD = .23, range = .39–2.2). How robust a relationship is it? Although we do not have data on a second comparable sample, we did draw 20 random split-half samples, and computed the resulting correlations between wisdom-related performance and moral reasoning. The resulting estimate for the confidence interval of this correlation was .28 ± .02.

Are peak levels of wisdom-related performance possible when moral reasoning ability is low? We defined peak levels of wisdom-related performance as those in the top 20% (see also Baltes et al., 1995). For this analysis, we classified individuals as being in either the top 20% of wisdom-related performances (wisdom score greater than 4.85; $n = 45$), or not (wisdom score below 4.85; $n = 175$). We also classified each individual as being in either the bottom 20% of moral reasoning performances (moral reasoning below .53; $n = 45$), the top 20% of moral reasoning performances (moral reasoning above .81; $n = 43$), or in the middle range of moral reasoning performances (moral reasoning scores between .53 and .81; $n = 132$). We then examined the relationship between these classifications. Such an analysis represents a first approach to exploring a threshold relationship between wisdom-related performance and moral reasoning.

The results are shown in Table 3. The overall $\chi^2_{(2)} = 16.8$, $p < .001$ confirms that the two performances are related. As can be seen, of those people among the top 20% of wisdom-related performances only 2 (rather than the expected 9) were in the bottom 20% of moral reasoners. This 20% cut-off for moral reasoning, a value of .53, can be thought of as the point below which participants found pre- and post-conventional reasons (stages 1 through 4) slightly more acceptable than principled reasons (stages 5 and 6). Note that the linear relationship detected above is not due solely to the bottom 20% of moral reasoners in the sample; when excluding these individuals moral reasoning and wisdom remain significantly correlated ($r = .20$, $p < .01$), though at a smaller magnitude.

In sum, the hypothesis that moral reasoning and wisdom-related performance would be related received clear, though moderate support. This relationship had both a linear aspect and a threshold aspect. Specifically, at very low levels of moral reasoning ability, peak levels of wisdom-related performance were extremely unlikely.

What is it that accounts for the linear relationship between wisdom-related performance and moral reasoning? In exploring this question, we first examined zero-order correlations between moral reasoning, wisdom-related performance, and the person characteristics that were identified as correlates of wisdom-related performance in earlier work (see Table 4). Two points can be made from Table 4. First, consistent with the literature, wisdom-related performance and moral reasoning evinced similar relationships with person characteristics, as shown by Table 4. Thus, person characteristics could mediate the relationship between moral reasoning and wisdom-related performance. Second, many of the person characteristics showed strong intercorrelations, particularly subscales of the thinking styles measures.

In order to reduce redundancy in our predictor sets, we

Table 3
Moral reasoning and wisdom-related performance: A threshold?

	Lower 20% moral reasoners		*Average moral reasoners*		*Upper 20% moral reasoners*	
	Observed	*Expected*	*Observed*	*Expected*	*Observed*	*Expected*
Average wisdom performers	43	36	106	105	26	34
Peak wisdom performers (20%)	2	9	26	27	17	9
Total	45		132		43	

Note: Expected gives the counts expected if these two performances were independent.

Table 4

Bivariate correlations between moral reasoning, wisdom-related performance, and person characteristics

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
1 Wisdom	1.00																								
2 Moral reasoning	.29*	1.00																							
3 Legislative style	.09	−.14*	1.00																						
4 Executive style	−.09	−.18*	.11	1.00																					
5 Judicial style	.19*	.02	.50*	.21*	1.00																				
6 Global style	−.07	−.33*	.43*	.29*	.24*	1.00																			
7 Local style	−.12	−.17*	.15*	.30*	.16*	−.13	1.00																		
8 Progressive style	.22*	.04	.65*	−.05	.64*	.21*	.08	1.00																	
9 Conservative style	−.27*	−.29*	−.05	.73*	−.06	.31*	.33*	−.36*	1.00																
10 Hierarchic style	.03	−.20*	.51*	.46*	.47*	.41*	.15*	.40*	.23*	1.00															
11 Monarchic style	−.22*	−.34*	.31*	.43*	.20*	.53*	.20*	.03	.51*	.35*	1.00														
12 Oligarchic style	−.34*	−.39*	.24*	.45*	.15*	.33*	.34*	−.01	.56*	.28*	.56*	1.00													
13 Anarchic style	−.08	−.15*	.37*	.12	.36*	.18*	.34*	.26*	.10	.23*	.20*	.31*	1.00												
14 Internal style	−.09	−.23*	.61*	.16*	.25*	.36*	.25*	.27*	.20*	.30*	.44*	.37*	.24*	1.00											
15 External style	.10	.00	.07	.38*	.27*	.22*	.10	.11	.21*	.22*	.14*	.18*	.27*	−.33*	1.00										
16 Neuroticism	−.13	−.10	−.27*	.13	−.22*	.01	.21*	−.35*	−.33*	−.14*	.22*	.21*	.02	−.07	.00	1.00									
17 Extraversion	.11	.08	.06	−.03	.05	−.00	−.00	.14*	−.10	.07	−.13*	.02	.22*	−.20*	.36*	−.27*	1.00								
18 Openness	.31*	.20*	.18*	−.31*	.37*	.01	−.19*	.41*	−.45*	.09	−.10	−.26*	.04	−.07	.01	−.10	.12	1.00							
19 Agreeableness	.07	.01	−.00	.12	−.09	.01	.01	−.02	.05	.14*	−.05	−.03	.04	−.10	.24*	−.10	.29*	.16*	1.00						
20 Conscientiousness	−.04	−.17*	.36*	.45*	.20*	.20*	.21*	.16*	.31*	.60*	.29*	.29*	.15*	.37*	.09	−.23*	.12	−.15*	.30*	1.00					
21 Psychological mindedness	.26*	.16*	−.04	−.23*	.09	−.18*	−.23*	.22*	−.41*	−.07	−.35*	−.37*	−.20*	−.17*	−.13	−.42*	−.01	.23*	−.08	−.16*	1.00				
22 Vocabulary	.36*	.23*	.11	−.07	.13	.02	−.22*	.20*	−.19*	.05	−.17*	−.20*	−.07	.03	−.12	−.15*	−.11	.31*	.12	−.08	.29*	1.00			
23 Analogical reasoning	.23*	.40*	−.23*	−.31*	−.07	−.30*	−.23*	−.02	−.37*	−.30*	−.43*	−.42*	−.07	−.31*	−.07	−.11	.04	.25*	−.07	−.34*	.35*	.29*	1.0		
24 Practical knowledge	.24*	.20*	−.03	−.11	.00	−.15*	.05	.05	−.12	−.05	−.23*	−.23*	−.07	−.07	−.12	−.08	.02	.05	.09	−.06	.16*	.43*	.24*	1.00	
25 Creativity	.39*	.18*	.07	−.10	.12	−.07	−.08	.15*	−.14*	.05	−.07	−.13*	−.03	−.02	.00	−.01	.03	.13	−.05	−.01	.19*	.33*	.16*	.29*	1.00

* $p < .05$.

Table 5
Hierarchical regression predicting wisdom-related performance

Predictor variables	ΔR^2	ΔF	$p <$
Equation 1			
First step: Moral reasoning	.08	19.9	.001
Second step: Person characteristics	.23	10.2	.001
Equation 2			
First step: Person characteristics	.31	13.5	.001
Second step: Moral reasoning	.01	1.8	n.s.

conducted regressions within each set (personality, intelligence, and their interface) predicting wisdom-related performance using backwards elimination. Based on the results of these backward regressions, personality was represented by openness to experience, intelligence by analogical reasoning and vocabulary, and the personality-intelligence interface by creativity, and judicial, oligarchic, and external thinking styles. This nonredundant predictor set was employed for the remaining analyses in this section.[4]

We then conducted two hierarchical regression analyses predicting wisdom-related performance which are summarised in Table 5. In the first model we entered moral reasoning first, followed by the person characteristics. This model provides the baseline for comparison with the second model. In the second, we entered the person characteristics first, and moral reasoning last. Together, all independent variables (person characteristics and moral reasoning) accounted for 32% of the total variance in wisdom-related performance. Table 5 illustrates that moral reasoning accounted for a total of 8% of the variance (when entered first), but virtually none of this variance was unique to moral reasoning. In other words, the contribution of moral reasoning to wisdom-related performance is almost completely shared with person characteristics. These results suggest that we can understand the predictive relationship between moral reasoning and wisdom-related performance through person characteristics. In particular, this result raises the question of which specific person characteristics are mediating the relation between moral reasoning and wisdom-related performance.

Which person characteristics serve the strongest mediating function? Further detail about the relations between moral reasoning and other variables in predicting wisdom-related performance can be gleaned from commonality analysis (Pedhazur, 1982). In this analysis, 7% of the 8% predictive variance due to moral reasoning is shared with person characteristics. Table 6 depicts the composition of this shared predictive variance. As shown in Table 6, moral reasoning shares approximately 2% of its power to predict wisdom-related performance with the personality-intelligence interface measures, 1% with both personality and the interface measures, 2% with cognitive measures and the interface measures, and 3% with personality, cognitive, and interface measures. In other words, the strongest overlap in single predictors is between moral reasoning and the interface measures, and there is much overlap between moral reasoning and all three of the person

[4] Although the analyses presented did not include years of education, recomputing all analyses including education as the first predictor in the equation increases the total variance accounted for to 40%, but does not result in any changes to the pattern of results observed.

Table 6
Which type of person characteristic has the most overlap with moral reasoning in predicting wisdom-related performance?

Predictor set	*Predictive variance shared with moral reasoning* (7%)
Personality	.00
Intelligence	.00
Personality-intelligence interface	.02
Personality and intelligence	.00
Personality and interface	.01
Intelligence and interface	.02
Personality, intelligence and interface	.03

Note: Numbers do not sum exactly because of rounding.

predictors (Appendix B provides more detail about this analysis, including information about individual predictors for each regression equation in the commonality analysis).

Individual predictors are listed in Table B1 in Appendix B. Examining the significance of individual predictors suggested that moral reasoning predicted wisdom independently of the intelligence measures, and of the personality measures, as moral reasoning remained a significant predictor in the context of vocabulary, analogical reasoning, and openness to experience. In contrast, moral reasoning was never a significant predictor of wisdom in the context of the interface measures. Specifically, oligarchic style, external style, and creativity appeared to overlap with moral reasoning in predicting wisdom-related performance, as evidenced by the fact that their presence in a regression model ensured that moral reasoning would not be a significant predictor, and as supported by examining the zero-order correlations presented earlier. In particular, creativity and an oligarchic thinking style demonstrated similar, and significant bivariate correlations with both moral reasoning and wisdom-related performance. In sum, both moral reasoning and wisdom-related performance are supported by creativity, and by the absence of a tendency to juggle multiple, equally important goals. This relationship is evident from a commonality analysis perspective, and by examining bivariate correlations and individual predictors, as well.

Moral reasoning as a moderator of the relationship between age and wisdom-related performance

In our final set of analyses we examined relationships between age, moral reasoning, and wisdom-related performance. As in prior work, age was not associated with wisdom-related performance ($r = -.03$), whereas moral reasoning performance showed decline with increasing age ($r = -.31$); see Baltes & Staudinger, 2000; Pratt et al., 1996). We next examined whether the relationship between age and wisdom-related performance might vary depending on a person's level of moral reasoning. This is a cross-sectional approach to examining whether some abilities appear to facilitate the acquisition of wisdom-related knowledge and judgement over time. Our hierarchical regression model predicted wisdom-related performance from the interaction of age and moral reasoning, after controlling for main effects of both. The overall model accounted for 12% of the variance in wisdom-related performance, $F(3, 216) = 9.7$, $p < .001$. The interaction of age and moral reasoning was associated with higher wisdom-related performance ($\Delta R^2 = .03$; $\Delta F = 7.8$; $p < .01$). Age was

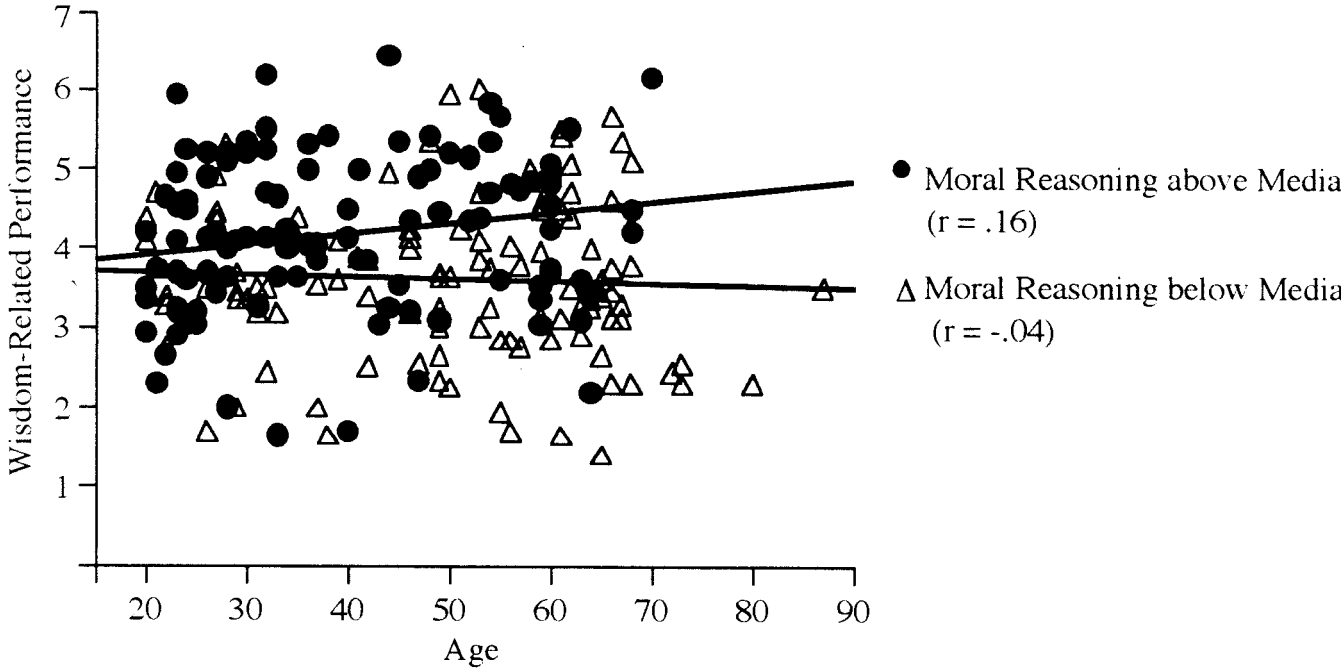

Figure 2. Moral reasoning moderates the relationship between age and wisdom-related performance.

associated with reductions in wisdom-related performance ($\Delta R^2 = .03$; $\Delta F = 6.1$ $p < .02$; $\beta = -.59$, $t = -2.5$, $p < .02$), and moral reasoning was not a significant predictor of performance after age was partialled out ($\Delta R^2 = .005$; $\Delta F = 1.3$; p = n.s.). Follow-up analyses of the interaction effect showed that for individuals who performed above the median on moral reasoning, increasing age was associated with higher wisdom-related performances ($r = .16$). For those who performed below the median on moral reasoning, age was unrelated to wisdom-related performance ($r = -.04$). This is shown in Figure 2. Further, the interaction remained significant even after statistically controlling for all person characteristics ($\Delta R^2 = .01$; $\Delta F = 4.1$; $p = .05$). This finding also proved robust when we drew random split-half samples and computed the variance accounted for by the interaction term in each sample. Over 20 samples, the average size of the interaction term was $\Delta R^2 = .04$, with a confidence interval of .036–.044.[5]

Discussion

The purpose of this study was to provide an empirical test of the relationship between moral reasoning and wisdom-related knowledge and judgement. The findings confirmed our two predictions and yielded an interesting age interaction. First, participants whose moral reasoning was more principled (i.e., of a higher quality) also showed higher levels of wisdom-related performance and principled moral reasoning seems close to a necessary condition for higher levels of wisdom-related performance. Second, as demonstrated by the regression analyses and commonality analysis, this association was mediated by person characteristics like creativity, cognitive styles, personality, and intellectual ability. Finally, moral reasoning was a moderator of the relationship between age and wisdom-related performance. Specifically, among participants with high levels of moral reasoning, wisdom-related performance increased across the age range of the sample. For those with lower levels of moral reasoning, wisdom-related performance and age were unrelated. Before we discuss implications of our findings, at least four important limitations must be addressed.

Limitations

First, our study is cross-sectional and correlational in nature; leaving us with no information on the developmental course and sequence of relationships between moral reasoning and wisdom-related knowledge and judgement. Second, we employed a questionnaire method to assess moral reasoning rather than a Kohlberg-type interview procedure, though the latter is more similar to our own wisdom-related assessment. This decision was made on pragmatic grounds, as the wisdom paradigm is costly and time-consuming and adding another costly procedure to assess moral reasoning was not possible. Thus, it could be the case that the relationship between moral reasoning and wisdom-related performance would actually be higher if both constructs were assessed using interview measures. Available data suggest that correlations between the interview and questionnaire methods assessing moral reasoning are reasonable, sometimes as high as .70, and averaging around .40 (Rest, 1983, 1986). Third, our explicit goal was to assess moral reasoning rather than other aspects of morality. Other facets of morality include assessing situations as moral, being motivated to take moral action, and actually enacting moral behaviours (see Rest, 1983, 1994). Our view was that moral reasoning (determining which course of action is moral) is most similar in spirit to our own wisdom tasks that

[5] As Cohen (1994) has convincingly argued, it is not the effect size but rather statistical significance that is of importance for evaluating interactions, because interactions aim at understanding processes and not at identifying population parameters.

also ask for judgement and advice (e.g., "What could one do or think in such a situation?"). However, wisdom-related knowledge and judgement might be related to many other facets of morality. For example, metamoral reasoning, or knowledge about when moral reasoning ought to be employed, might be another feature of wisdom-related knowledge and judgement (e.g., Swanson & Hill, 1993). These remain open questions for future investigations. Finally, our assessment of moral reasoning is not the only way that moral reasoning can be assessed, and many critiques of Kohlberg's general view and related measures can be found (see, e.g., Boyes & Walker, 1988; Gilligan, 1982; Wygant, 1997).

Implications for theories of wisdom and moral reasoning

Despite such limitations, these findings provide support for theoretical conceptions of wisdom and morality presented above. All of the theories reviewed, including the implicit or "lay" theories, suggested that better moral reasoning should be related to higher wisdom-related performances and vice versa. Some implied that at very low levels of moral reasoning, wisdom (peak levels of wisdom-related knowledge and judgement) would be impossible. We found only moderate evidence in the present study for these hypotheses. At least when using these particular measures, better moral reasoning is weakly related to better wisdom-related performance. The size of the linear relationship was about the same as many other correlations reported in the literature on personality, creativity, and cognitive style. Further, the threshold analysis suggested that almost none of the individuals with very low (bottom 20%) moral reasoning performances were among the top performers with respect to wisdom-related knowledge and judgement. Certainly, this analysis is a rough approximation to testing a threshold relationship, and ultimately threshold relations should be evaluated using other measures and more powerful statistical approaches. These findings suggest some overlap, but substantial discriminant validity in measures of moral reasoning, and our assessment of wisdom-related knowledge and judgement.

The linear relationship between wisdom-related performance and morality was mediated by a set of variables measuring person characteristics, and particularly, with measures of the interface between personality and intelligence, like creativity or thinking style. This does not mean the relationship between moral reasoning and wisdom-related performance is uninteresting. Rather, it indicates that moral reasoning and wisdom-related performance draw on similar cognitive and personality resources, in particular, thinking styles and creativity. This lack of uniqueness in association is also consistent with conceptions of moral reasoning and wisdom-related knowledge and judgement. Both moral reasoning and wisdom (peak levels of wisdom-related knowledge and judgement) are theorised to draw on particular abilities and qualities of persons. For example, our own findings about the development of wisdom show that this development draws on qualities like creativity, openness to experience, and a tendency to think about how and why events happen, rather than judging them as good or bad (Staudinger et al., 1997). Similarly, recent arguments about peak morality and high levels of moral reasoning propose a role for person qualities like openness to experience (e.g., Colby & Damon, 1992) and a complex way of thinking about situations (Rest, 1986). Based on theories of moral reasoning and wisdom, it is not surprising that the same qualities support both capacities, and thus mediate the relationship between them.

Of course, to some extent, the tasks assessing wisdom-related knowledge and judgement and those assessing moral reasoning are related, and thus demand similar background abilities and qualities. We view this overlap in methodology less as an artifact than as reflective of the conceptual similarities between theories of wisdom and morality. However, in this study wisdom-related performance was assessed using a production or "free recall" measure, and moral reasoning was assessed using a "recognition" measure. That is, wisdom in the present study was assessed very differently (using open-ended responses) than was moral reasoning (which was indexed from reactions to standardised items).

All of the predictive power of moral reasoning in predicting wisdom-related performance was shared in some way with the interface measures, while only about half was also shared with personality or cognitive measures. So, a configuration of personality and cognitive characteristics rather than one or the other alone best accounts for the relationship between moral reasoning and wisdom-related performance. This is consistent with notions of moral reasoning as cognition about values, ethics, and situations in which individual desires and collective good may be at odds (Rest, 1983), and with notions of wisdom as the adaptive integration of cognition, emotion, and motivation (Staudinger & Baltes, 1994).

Are advanced moral reasoners more likely to develop wisdom?

Our third, and exploratory finding, that older adults with principled moral reasoning were among the most wise in this sample, is a rich source for speculation about the development of wisdom. The finding suggests that those with advanced moral reasoning ability acquire more wisdom-related knowledge and judgement with age, whereas those with lower levels of moral reasoning ability do not. What can we make of this? One set of interpretations highlights the role of knowledge structures in knowledge acquisition over the lifespan. Many researchers have suggested that structures can facilitate the acquisition of content, whether structures are viewed as content-free, as in cognitive-structuralist accounts of development (Kohlberg, 1973; Piaget, 1932) or structures are viewed as expert, routinised knowledge (e.g., Chi, Glaser, & Farr, 1991; Ericsson & Smith, 1991). Such structures are a key tool in the individual's intellectual development, in that they provide a means by which experiences may be assimilated or accommodated over time.

Applied specifically to wisdom, abstract, high level ethical principles might provide a relatively complex structure or heuristic (Baltes & Staudinger, 2000) with which to make sense of difficult life situations one encounters. This, in turn, facilitates further acquisition of knowledge about factual and procedural aspects of difficult life situations, as well as the awareness of limits, constraints, and conditions on that knowledge. Advanced moral reasoners have a sophisticated conceptual tool—their capacity to make use of abstract ethical principles—for extracting insight from experience. As they grow older, then, and acquire experiences, they stand to gain more from that experience than those who lack this tool. Knowledge acquisition earlier in life may lead to the formation of ethical principles as behavioural guidelines, with these

principles in turn facilitating further knowledge acquisition in the area of life pragmatics.

There are many alternative accounts, of course. Sophisticated moral reasoning may also require that people transcend their individual beliefs and values in favour of more general principles This ability to transcend one's own perspective may, in turn, facilitate the acquisition and expression of wisdom-related knowledge and judgement over time, from life experiences. Or, alternatively, demonstrating a consistent preference for complex moral arguments on an instrument like the MJT may indicate a similar preference for complex thinking about life experiences, again, leading to the acquisition of greater insight from experience over time. These three accounts, one invoking knowledge structures, one invoking perspective-taking capacity, and a third invoking motivations or preferences for complex thinking, all share a common pathway to facilitating the lifespan acquisition of wisdom: All point to the greater likelihood that a person will gain insight from experience. Our findings do not allow us to distinguish between these (or other) alternative explanations; they raise new questions for future work on the development of wisdom. In addition, they suggest that other kinds of reasoning in adulthood, such as reflective judgement (Kitchener & King, 1990) or integrated thinking (Labouvie-Vief, DeVoe, & Bulka, 1989) might have similar relationships with one another, and/or age.

Are advanced moral reasoners more likely to demonstrate wisdom? Our results suggest that to some extent, they are. Further, the findings imply that this is because people who are creative, and who do not like to juggle competing, equally valued goals but are rather able to set priorities tend to be advanced in moral reasoning, and also to demonstrate high levels of wisdom-related knowledge and judgement. Finally, moral reasoning may be a way of thinking about situations that supports the development of wisdom-related knowledge and judgement, which suggests that advanced moral reasoners may be particularly likely to accumulate wisdom. This paper provides but a first set of pieces in the complicated puzzle of the relationship between moral reasoning and wisdom-related performance. Those pieces, in turn, have pointed to additional parts of the puzzle, in particular, the processes that may link wisdom-related performance and reasoning over adulthood.

Manuscript received July 1999
Revised manuscript received March 2000

References

Alexander, C., & Langer, E.J. (Eds.) (1900). *Beyond formal operations: Alternative endpoints to human development.* New York: Oxford University Press.

Almond, B. (1997). Seeking wisdom. *Philosophy*, *72*.

Assmann, A. (1994). Wholesome knowledge: Concepts of wisdom in a historical and cross-cultural perspective. In D.L. Featherman, R.M. Lerner, & M. Perlmutter (Eds.), *Life-span development and behavior* (Vol. 12, pp. 187–224). Hillsdale, New Jersey: Lawrence Erlbaum.

Baltes, P.B., Kliegl, R., & Dittmann-Kohli, F. (1988). On the locus of training gains in research on the plasticity of fluid intelligence in old age. *Journal of Educational Psychology*, *88*, 392–400.

Baltes, P.B., Smith, J., & Staudinger, U.M. (1992). Wisdom and successful aging. In T.B. Sonderegger (Eds.), *Nebraska Symposium on Motivation 1991* (Vol. 39, pp. 123–67). Lincoln, NE: University of Nebraska Press.

Baltes, P.B., & Staudinger, U.M. (2000). Wisdom: A meta-heuristic (pragmatic) to orchestrate mind and virtue towards excellence. *American Psychologist*, *55*, 122–136.

Baltes, P.B. & Staudinger, U.M. (in press). *Wisdom: The orchestration of mind and character.* Boston: Blackwell.

Baltes, P.B., Staudinger, U.M., Maercker, A., & Smith, J. (1995). People nominated as wise. A comparative study of wisdom-related knowledge. *Psychology and Aging*, *10*, 155–166.

Borkenau, P., & Ostendorf, F. (1989). Untersuchungen zum Fünf-Faktoren-Modell der Persönlichkeit und seiner diagnostischen Erfassung [A study of the five-factor model of personality and its assessment]. *Zeitschrift für Differentielle und Diagnostische Psychologie*, *10*, 239–251.

Boyes, M.C. & Walker, L.J. (1988). Implications of cultural diversity for the universality claims of Kohlberg's theory of moral reasoning. *Human Development*, *31*, 44–59.

Chi, M.T.H., Glaser, R., & Farr, M.J. (1991). *Toward a general theory of expertise.* Hillsdale, NJ: Erlbaum.

Clayton, V., & Birren, J.E. (1980). The development of wisdom across the life span: A re-examination of an ancient topic. In P.B. Baltes & O.G. Brim (Eds.), *Life span development and behavior* (Vol. 3, pp. 103–135). New York: Academic Press.

Cohen, J. (1994). The earth is round ($p < .05$). *American Psychologist*, *49*, 997–1003.

Colby, A., & Damon, W. (1992). *Some do care.* New York: Free Press.

Colby, A., & Kohlberg, L. (1987). *The measurement of moral judgment* (Vol. 1). New York: Cambridge University Press.

Colby, A., Kohlberg, L., Gibbs, J., & Lieberman, M. (1983). A longitudinal study of moral development. *Monographs of the Society for Research in Child Development*, *48* (1-suppl. 2, Serial No. 124), 1–96.

Costa, P.T., & McCrae, R.R. (1985). *The NEO Personality Inventory: Manual Form S and Form R.* Odessa FL: Psychological Assessment Resources.

Csikszentmihalyi, M., & Rathunde, K. (1990). The psychology of wisdom: An evolutionary interpretation. In R.J. Sternberg (Ed.), *Wisdom: Its nature, origins, and development* (pp. 25–51). Melbourne, Australia: Cambridge University Press.

Ericsson, A.K., & Simon, H.A. (1984). *Protocol analysis; Verbal reports as data.* Cambridge, MA: MIT Press.

Ericsson, A.K., & Smith, J. (Eds.) (1991). *Toward a general theory of expertise: Prospects and limits.* Cambridge, MA: Cambridge University Press.

Erikson, E.H. (1959). *Identity and the life cycle.* New York: International Universities Press.

Erikson, E.H., Erikson, J.M., & Kivnick, H.Q. (1986). *Vital involvement in old age.* New York: Norton & Company.

Gilligan, C. (1982). *In a different voice: Psychological theory and women's development.* Cambridge, MA: Harvard University Press.

Gough, H.G. (1964). *The California psychological inventory.* Palo Alto, CA: Consulting Psychologists Press.

Holliday, S.G., & Chandler, M.J. (1986). *Wisdom: explorations in human competence.* New York: Karger.

Kekes, J. (1995). *Moral wisdom and good lives.* Ithaca, NY: Cornell University Press.

Kitchener, K.S., & King, P.M. (1990). The reflective judgment model: Ten years of research. In M.L. Commons, C. Armon, L. Kohlberg, F.A. Richards, T.A. Grotzer, & J.D. Sinnott (Eds.), *Adult development: Vol. 2. Models and methods in the study of adolescent and adult thought* (pp. 63–78). New York: Praeger.

Kohlberg, L. (1973). Continuities and discontinuities in childhood and adult moral development revisited. In P. Baltes & K.W. Schaie (Eds.), *Lifespan developmental psychology.* New York: Academic Press.

Kuhn, D., Langer, J., Kohlberg, L., & Haan, N.S. (1977). The development of formal operations in logical and moral judgment. *Genetic Psychology Monographs*, *95*, 97–188.

Labouvie-Vief, G. (1990). Wisdom as integrated thought: Historical and developmental perspectives. In R.J. Sternberg (Ed.), *Wisdom: Its nature, origins, and development* (pp. 52–83). New York: Cambridge University Press.

Labouvie-Vief, G., Hakim-Larson, J., & Hobart, C.J. (1987). Age, ego level, and the life-span development of coping and defense processes. *Psychology and Aging*, *2*, 286–293.

Labouvie-Vief, G., DeVoe, M., & Bulka, D. (1989). Speaking about feelings: Conceptions of emotion across the life span. *Psychology and Aging*, *4*, 425–437.

Lind, G. (1978). Wie mißt man moralisches Urteil? Probleme und alternative Möglichkeiten der Messung eines komplexen Konstrukts [How does one measure moral reasoning? Problems and alternative possibilities for measurement of a complex construct]. In G. Portele (Ed.), *Sozialisation und Moral* (pp. 171–201). Weinheim: Beltz.

Lind, G. (1983). Growth and regression in cognitive-moral development of young college students. *Entwicklung der Studiensituation in den 80er Jahren (Arbeitsunterlage 74)*. Konstanz, Germany: Universität Konstanz.

Lind, G. (1985). The theory of moral-cognitive development: A socio-psychological assessment. In G. Lind, H.A. Hartmann, & R. Wakenhut (Eds.), *More development and the social environment* (pp. 55–77). Chicago, IL: Precedent Publishing.

Lind, G. (April, 1995). *The meaning and measurement of moral competence revisited—A dual aspect model.* Invited address, SIG Moral Development and

Education, American Educational Research Association annual meetings, San Francisco.

Lind, G., & Wakenhut, R. (1980). Erfassung von moralischem Urteil mit standardisierten Fragebogen [Measurement of moral reasoning with standardized questionnaires]. *Diagnostica*, *26*, 312–334.

Lindenberger, U., Mayr, U., & Kliegl, R. (1993). Speed and intelligence in old age. *Psychology and Aging*, *8*, 207–220.

Maercker, A., Böhmig-Krumhaar, S.A., & Staudinger, U.M. (1998). Existentielle Konfrontation also Zugang zu weisheitsbezogenum Wissen und Urteilen: Eine Untersuchung von Weischeitsnominierten [Existential confrontation as an inroad to wisdom-related knowledge and judgement: A study of wisdom nominees.] *Zeitschrift für Entwicklungspsychologie und Pädagogische Psychologie*, *30*, 2–12.

Orwoll, L., & Perlmutter, M. (1990). The study of wise persons: Integrating a personality perspective. In R.J. Sternberg (Ed.), *Wisdom: Its nature, origins, and development* (pp. 160–177). New York: Cambridge University Press.

Pascual-Leone, J. (1990). An essay on wisdom: Toward organismic processes that make it possible. In R.J. Sternberg (Ed.), *Wisdom: Its nature, origins, and development* (pp. 244–278). New York: Cambridge University Press.

Pasupathi, M., & Baltes, P.B. (2000). Wisdom. In Kazdin A.E. (Ed.), *Encyclopedia of psychology*. Washington, DC: American Psychological Association.

Pasupathi, M., Staudinger, U.M., & Baltes, P.B. (2000). Seeds of wisdom: Adolescents' knowledge and judgment about difficult life problems. Manuscript submitted for publication. Berlin: Max Planck Institute for Human Development.

Pedhazur, E.J. (1982). *Multiple regression in behavioral research: Explanation and prediction* (2nd ed.). New York: Holt, Rhinehart & Winston.

Piaget, J. (1932). *The moral judgment of the child*. New York: Free Press.

Pratt, M.W., Diessner, R., Pratt, A., Hunsberger, B., & Pancer, S.M. (1996). Moral and social reasoning and perspective taking in later life: A longitudinal study. *Psychology and Aging*, *11*, 66–73.

Pratt, M., Pancer, S.M., Hunsberger, B., & Manchester, J. (1990). Reasoning about the self and relationships in maturity: An integrative complexity analysis of individual differences. *Journal of Personality and Social Psychology*, *59*, 575–581.

Raven, J.C. (1971). *Advanced progressive matrices APM*. London: Lewis & Co.

Rest, J.R. (1983). Morality. In J.H. Flavell, E.M. Markman, & P.H. Mussen (Eds.), *Handbook of child development* (pp. 556–629). New York: Wiley.

Rest, J.R. (1994). Background: Theory and research. In J.R. Rest & D. Narváez (Eds.), *Moral development in the professions* (pp. 1–26). Hillsdale, NJ: Erlbaum.

Rest, J.R., & Narváez, D. (1994). *Moral development in the professions* (pp. 1–26). Hillsdale, NJ: Erlbaum.

Rest, J.R., Thoma, S.J., Narváez, D., & Bebaue, M.J. (1997b). Alchemy and beyond: Indexing the Defining Issues Test. *Journal of Educational Psychology*, *89*, 498–507.

Rest, J. (1986). *Moral development: Advances in research and theory*. New York: Praeger.

Rest, J., Thoma, S., & Edwards, L. (1997a). Designing and validating a measure of moral judgment: Stage preference and stage consistency approaches. *Journal of Educational Psychology*, *89*, 5–28.

Rest, J., Turiel, E., & Kohlberg, L. (1969). Level of moral development as a determinant of preference and comprehension of moral judgments made by others. *Journal of Personality*, *37*, 225–252.

Selman, R.L. (1971). The relation of role taking to the development of moral judgment in children. *Child Development*, *42*, 79–91.

Smith, J., & Baltes, P.B. (1990). Wisdom-related knowledge: Age/cohort differences in response to life-planning problems. *Developmental Psychology*, *26*, 494–505.

Smith, J., Staudinger, U.M., & Baltes, P.B. (1994). Occupational settings facilitating wisdom-related knowledge: The sample case of clinical psychologists. *Journal of Consulting and Clinical Psychology*, *62*, 989–999.

Staudinger, U.M. (1999). Older and wiser? Integrating results on the relationship between age and wisdom-related performance. *International Journal of Behavioral Development*, *23*, 641–664.

Staudinger, U.M., & Baltes, P.B. (1994). The psychology of wisdom. In R.J. Sternberg (Ed.), *Encyclopedia of intelligence* (pp. 1143–1152). New York: Macmillan.

Staudinger, U.M., & Baltes, P.B. (1996). Interactive minds: A facilitative setting for wisdom-related performance? *Journal of Personality and Social Psychology*, *71*, 746–762.

Staudinger, U.M., Lopez, D.F., & Baltes, P.B. (1997). The psychometric location of wisdom-related performance. *Personality and Social Psychology Bulletin*, *23*, 1200–1214.

Staudinger, U.M., Maciel, A.G., Smith, J., & Baltes, P.B. (1998). What predicts wisdom-related performance? A first look at personality, intelligence, and facilitative experiential contexts. *European Journal of Personality*, *12*, 1–17.

Staudinger, U.M., Maciel, A.G., Sowarka, D., Smith, J., & Baltes, P.B. (2000). *Characteristics of a wise person: interrelating implicit and explicit theories of wisdom*. Unpublished manuscript, Max Planck Institute for Human Development.

Staudinger, U.M., & Pasupathi, M. (2000). Life-span perspectives on self, personality, and social cognition. In F.I.M. Craik & T.A. Salthouse (Eds.), *The handbook of aging and cognition*, (2nd ed., pp. 633–688). Hillsdale, NJ: Erlbaum.

Staudinger, U.M., Smith, J., & Baltes, P.B. (1992). Wisdom-related knowledge in a life review task: Age differences and the role of professional specialization. *Psychology and Aging*, *7*, 271–281.

Staudinger, U.M., Smith, J., & Baltes, P.B. (1994). *Manual for the assessment of wisdom-related knowledge and judgment* (Technical Report). Berlin, Germany: Max Planck Institute for Human Development and Education.

Sternberg, R.J. (1986). Implicit theories of intelligence, creativity, and wisdom. *Journal of Personality and Social Psychology*, *49*, 607–627.

Sternberg, R.J. (1988) Mental self-government: A theory of intellectual styles and their development. *Human Development*, *31*, 197–224.

Sternberg, R.J. (1994). Thinking styles: Theory and assessment at the interface between intelligence and personality. In R.J. Sternberg & P. Ruzgis (Eds.), *Personality and intelligence* (pp. 169–187). New York: Cambridge University Press.

Sternberg, R.J. (1998). A balance theory of wisdom. *Review of General Psychology*, *2*, 347–365.

Stewart, L., & Pascual-Leone, J. (1992). Mental capacity constraints and the development of moral reasoning. *Journal of Experimental Child Psychology*, *54*, 251–287.

Swanson, H.L., & Hill, G. (1993). Metacognitive aspects of moral reasoning and behavior. *Adolescence*, *28*, 711–735.

Torrance, E.P. (1974). *The Torrance tests of creative thinking: Technical norms manual*. Bensenville, IL: Scholastic Testing Services.

Turiel, E. (1998). The development of morality. In Damon, W., & Eisenberg, N. (Eds.), *Handbook of child psychology (5th ed.)*, (Vol. 3, pp. 863–932). New York: Wiley & Sons.

Walker, L.J. & Pitts, R.C. (1998). Naturalistic conceptions of moral maturity. *Developmental Psychology*, *34*, 403–419.

Wechsler, D. (1982). *Handanweisung zum Hamburg-Wechsler-Intelligenztest für Erwachsene (HAWIE)*. Bern, Switzerland: Huber.

Weinert, A.B., Streufert, C., & Hall, W.B. (1982). *Deutscher CPI (Standard Form 480)*. Bern, Switzerland: Huber.

Wygant, S.A. (1997). Moral reasoning about real-life dilemmas: Paradox in research using the Defining Issues Test. *Personality and Social Psychology Bulletin*, *23*, 1022–1033.

Appendix A

Moral reasoning task

The Moral Judgment Test (Lind, 1983, 1985) presents participants with two ethical dilemmas faced by hypothetical characters. The characters select a particular action. Participants first decide whether they agree with the action taken, and then rate the acceptability of several reasons justifying or condemning this action. There are 12 reasons per dilemma, six pro, and six con, with two statements representing each of Kohlberg's moral reasoning stages (one pro and one con). Reasons at stages 5 and 6 in Kohlberg's scheme represent principled moral reasoning. Below are some example reasons, ordered in terms of their Kohlbergian stage, for a dilemma in which a terminally ill patient asks a doctor to give her an overdose of painkillers. The doctor complies, and participants must evaluate the acceptability of a set of arguments for or against the doctor's action, including the following arguments (translated from the German):

1. because he probably put himself into a very difficult situation. Others have already been punished for similar actions. (con)
2. because the woman would have died anyway, and it was not so difficult for him to give her a bigger dose of pain reliever. (pro)
3. because probably most of his colleagues would have behaved similarly, given a similar situation. (pro)
4. because he did not break any laws, because the woman couldn't be saved and he reduced the amount of time that she would have to suffer. (pro)
5. because people must be able to fully trust a doctor to be completely oriented towards preserving life, even when they themselves might want to die because of terrible pain. (con)
6. because protecting the life of a person is the highest moral imperative. As long as there are no clear criteria to distinguish euthanasia from murder we can't allow anyone to interfere with the lives' of others in this way. (con)

Appendix B

Commonality analysis

Commonality analysis is computed by calculating the variance accounted for by all predictors and individually by combinations of predictors, and then using this information to compute the amount of variance that is unique to each predictor, or shared among various combinations of predictors. In the text we presented these results with a strong focus on moral reasoning as a predictor of wisdom. In this appendix we present the regression results used to compute commonality analyses, and a brief overview of how the regression results were used to compute commonality analyses for those readers unfamiliar with this technique. Regression analyses are conducted to determine: (1) the total variance accounted for by all predictors; (2) the variance accounted for by each group of predictors entered singly; (3) the variance entered by each possible pairwise combination of predictors; and (4) the variance accounted for by each three-way combination of predictors. The results of these regressions are presented in Table B1.

The final step in conducting the commonality analysis is to compute the variance that is unique to each predictor group, shared between combinations of predictors, or shared among all groups of predictors. For example, to compute the variance uniquely accounted for by moral reasoning, we subtract the variance accounted for by personality, intelligence, and interface measures in Table B1, which includes all unique and shared variance involving these measures (34%) from the total variance accounted for by all predictors (34%). This yields 0. To estimate the amount of variance shared by personality and moral reasoning, we subtract the variance unique to personality (2%), unique to moral reasoning (0%), and the total shared and unique variance accounted for by intelligence and interface measures (32%). Again, this yields a value of 0. Finally, to estimate the variance shared by three predictors (e.g., personality, moral reasoning, and the interface measures), we subtract the variance unique to all three predictors (1%, 1%, and 12%, respectively), the variance uniquely shared among combinations of pairs of predictors (personality and interface, personality and moral reasoning, and interface and moral reasoning, or 2%, 0%, and 2%, respectively), and the total variance accounted for by intelligence alone and in combination with other predictors (10%). This yields a value of 1%.

Table B1

Regression models used in computing commonality analyses

Regression models	ΔR^2	UR^2	F	$p <$
Total variance (8 measures in all) Significant individual predictors: creativity, vocabulary, external style, oligarchic style ($ts > 3.0$, $ps < .05$).	.32		12.1	.001
Single predictor sets				
Personality (openness to experience)	.10	.01	22.7	.001
Intelligence only (vocabulary, analogical reasoning)	.13	.02	16.4	.001
Interface only (creativity, external, judicial, oligarchic thinking styles)	.27	.12	19.4	.001
Moral reasoning only	.08	.01	19.9	.01
Variance shared between pairs of predictor sets				
Personality and intelligence (3 measures) Significant individual predictors: vocabulary, openness to experience	.17	.01	14.6	.001
Personality and interface (5 measures) Significant individual predictors: creativity, openness to experience, oligarchic thinking style	.28	.02	16.8	.001
Personality and moral reasoning (2 measures)	.15	.00	18.6	.001
Intelligence and interface (6 measures) Significant individual predictors: creativity, oligarchic style, judicial style, external style, vocabulary	.30	.03	15.2	.001
Intelligence and moral reasoning (3 measures) Significant individual predictors: moral reasoning, vocabulary	.17	.00	14.2	.001
Interface and moral reasoning (5 measures) Significant individual predictors: creativity, judicial style, oligarchic style	.28	.02	16.3	.001
Variance shared between three predictor sets				
Personality, intelligence, interface (7 measures) Significant individual predictors: creativity, external style, oligarchic style vocabulary	.31	.02	13.5	.001
Personality, interface, moral reasoning (6 measures) Significant individual predictors: creativity, oligarchic style, openness to experience	.29	.01	14.5	.001
Personality, intelligence, moral reasoning (4 measures) Significant individual predictors: moral reasoning, openness to experience, vocabulary	.20	.00	13.1	.001
Intelligence, interface, and moral reasoning (7 measures) Significant individual predictors: oligarchic style, judicial style, external style, creativity, vocabulary	.31	.02	13.4	.001

Note: R^2 reflects the total variance accounted for by a set of predictors; the individual predictors identified had regression coefficients significant at the $p < .05$ level, in the context of that predictor set (i.e., not including other predictors). Where no individual predictors are listed, coefficients for *all* predictors in the equation were significant at $p < .05$. UR^2 reflects the unique variance accounted for by a predictor set.