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The Science of Wisdom in a Polarized World: Knowns and Unknowns

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ABSTRACT

Interest in wisdom in the cognitive sciences, psychology, and education has been paralleled by conceptual confusions about its nature and assessment. To clarify these issues and promote consensus in the field, wisdom researchers met in Toronto in July of 2019, resolving disputes through discussion. Guided by a survey of scientists who study wisdom-related constructs, we established a common wisdom model, observing that empirical approaches to wisdom converge on the morally-grounded application of metacognition to reasoning and problem-solving. After outlining the function of relevant metacognitive and moral processes, we critically evaluate existing empirical approaches to measurement and offer recommendations for best practices. In the subsequent sections, we use the common wisdom model to selectively review evidence about the role of individual differences for development and manifestation of wisdom, approaches to wisdom development and training, as well as cultural, subcultural, and social-contextual differences. We conclude by discussing wisdom's conceptual overlap with a host of other constructs and outline unresolved conceptual and methodological challenges.

Social critics and political pundits have rung the alarm on the rise of incivility (e.g., Simas, Clifford, & Kirkland, 2020), the proliferation of misinformation (Lazer et al., 2018), the increasing distrust in political institutions (Pew Research Center, 2017) and the lack of ethical considerations in the contemporary information and technology revolution (Obermeyer, Powers, Vogeli, & Mullainathan, 2019). A sizable portion of the world's population (62%) believe the world is getting worse (Roser & Nagdy, 2019). Meta-scientists in social and behavioral sciences call for intellectual humility and open-mindedness to overcome the replication crisis (e.g., Vazire, 2018). At the core of such sentiments is a call for greater wisdom that will be necessary for mastering the growing complexity and uncertainty of an ever-changing world (Glück, Sternberg, & Nusbaum, 2019). Yet, what is wisdom and how does one investigate it empirically? Moreover, how is wisdom distinct from a range of other psychological constructs, such as empathy, humility, openness, or rationality? These questions are at the heart of the current article.

We argue that central to dominant psychometric approaches to investigating wisdom is the study of morally-grounded excellence in social-cognitive processing. By moral grounding we mean a set of inter-related aspirational (or "normative" in the philosophical sense) goals: balance of self- and other-oriented interests, pursuit of truth, and orientation toward shared humanity. By excellence in social-cognitive processing we specifically refer to the application of certain forms of meta-cognition to reasoning and problem-solving in situational domains that have the potential to affect other people. The chief aim of our paper is to provide a rationale and empirical evidence for the preceding assertions.

For millennia, questions about the psychological meaning of wisdom have been at the heart of the philosophical inquiry into the human experience. Indeed, such questions are central to classical philosophical works in the West (e.g., Plato's *Socratic Dialogues* or Aristotle's *Nichomachean Ethics*) and elsewhere (e.g., Confucianism or Buddhism), as well as to religious traditions (Brown, 2000) and literary fiction (e.g., *Epic of Gilgamesh* or Dostoyevsky's *Brothers Karamazov*). Psychological scientists have long been interested in the topic of wisdom. Stanley Hall (Hall, 1904, 1922) argued that wisdom confers valuable societal benefits, a theme picked up in the 20th century by developmental psychologists such as Erikson (1950), Baltes and colleagues (Baltes & Staudinger, 2000), and Carstensen and colleagues (Carstensen & Löckenhoff, 2003). The topic has attracted scholars from a range of disciplines. Personality researchers have focused on the individual characteristics attributed to a

wise person (Helson & Srivastava, 2002; Staudinger, Maciel, Smith, & Baltes, 1998; Wink & Helson, 1997). Cognitive scientists have zeroed in on the processes implicated in wise decisions (Baltes & Smith, 2008; Gigerenzer, 1996). Social psychologists have started to address the role of social contexts in the development and expression of wisdom (Grossmann, 2017b; Staudinger, 1996).

Since the dawn of the 21st century, the scientific discourse on the topic of wisdom has gained momentum (Glück et al., 2013). However, the richness of this emerging field has also led to confusion about the psychological conceptualization of the construct. For instance, authoritative anthologies on wisdom in psychology (Sternberg & Glück, 2019; Sternberg & Jordan, 2005) have provided more construct definitions than chapters in each handbook. We should note that disagreements are frequent for complex psychological constructs (e.g., emotions, cf. Barrett, 2017; Cowen & Keltner, 2019; intelligence, Neisser et al., 1996; Sternberg, 2011), and interdisciplinary constructs rarely begin with agreed-upon definitions. Nevertheless, the plurality of wisdom definitions raises the questions about the theoretical and methodological clarity of the construct.

To address this issue, an international group of wisdom researchers—a Wisdom Task Force—gathered in Toronto, Canada, in the summer of 2019. The group's goal was to provide a systematic evaluation of dominant theoretical and methodological positions on wisdom in empirical psychology, with the purpose of defining a common position on wisdom in psychological science. Toward this aim, the Wisdom Task Force juxtaposed diverging assumptions about the psychological nature of wisdom and explored converging themes in the empirical study of wisdom. The present paper does not aim to address all of the current approaches to wisdom. For example, we do not review approaches to wisdom that focus chiefly on narratives (Glück, Bluck, Baron, & McAdams, 2005), metaphysics (Ashley, 2006) or ethics and ethics-related education (Gregory, 2009). Many of these do not readily avail themselves to empirical inquiry, which is our focus. Instead, in what follows, we focus on a limited and specific set of questions to identify the empirical characteristics that psychologists commonly discuss when evaluating wisdom-related concepts:

- What are the current significant conceptualizations of wisdom? (Section 1)
- What do wisdom measures test, and how well do they test it? (Section 2)
- How and why do individuals differ in wisdom (Section 3)?
- How do individuals develop wisdom? (Section 4)
- Do various cultural groups display different patterns of performance on wisdom tests, and if so, why? (Section 5)
- What significant scientific issues are presently unresolved? (Section 6)

Irrespective of the methodological background of the Wisdom Task Force members, our goal was to describe the state-of-the-art in wisdom research: what has been scientifically established, what is presently in dispute, and what is still unknown. In Section 1, we establish a consensus position across dominant approaches to the psychological science of wisdom. Specifically, we identify the central characteristics scientists attribute to wisdom and discuss theoretical and psychometric reasons for their centrality. We use this consensus position about the central characteristics of wisdom in behavioral, cognitive and social sciences to inform our review of the empirical evidence related to the questions raised in Sections 2–6.

Section 1. What Are the Current Significant Conceptualizations of Wisdom?

Before identifying dominant conceptualizations of wisdom, we begin with a brief review of the philosophical and psychological foundations of contemporary wisdom science. Next, we present results of a mixed-method survey of experts' conceptualizations of wisdom in empirical sciences. Guided by the results of this survey, we identify moral aspirations and certain aspects of meta-cognition as the most common features of the construct across definitions and operationalizations of wisdom. We explore theoretical and psychometric reasons for the centrality of these features across most wisdom definitions. Finally, we conclude this section by discussing how common features of wisdom are distinct from a variety of other individual difference constructs, including mainstream views on intelligence, rationality, emotional intelligence, and perspective-taking.

Challenges of Philosophical Definitions

Wisdom has been a central theme in philosophy and theology for millennia. Although diminished in consideration during the Age of Enlightenment, perhaps given way to the putative cold cognition of reason and intelligence, it reemerged in the 20th century (Grimm, 2015; Macintyre, 1988; Tiberius & Swartwood, 2011). Consequently, the philosophical foundations of wisdom are substantial and culturally diverse (for reviews, see Assmann, 1994; Edmondson & Woerner, 2019; Swartwood & Tiberius, 2019). However, wisdom-related philosophical definitions present some theoretical challenges for empirically oriented psychologists. To understand the conceptualizations of wisdom in empirical science today, we first review some of these challenges.

Philosophical theories on wisdom provide a rich conceptual legacy for empirical investigation. However, this legacy of theorizing also presents the challenge of integrating the variety of philosophical accounts of wisdom for empirical practice. In particular, empirical wisdom researchers have prioritized different philosophical models of wisdom, without specifying a shared theoretical vocabulary or standards to allow for a clear comparison between them (cf. Baltes & Smith, 2008; Li, Wang, Wang, Shi, & Xiong, 2019; Walsh, 2015). This theoretical diversity can lead researchers to use different terms for the same concept, or use the same term for different concepts, resulting in conceptual ambiguity. To overcome these challenges, one may first start by examining points of convergence among various theories of wisdom in philosophy. As one example, an attempt along these lines has identified *seeing through illusion* as a common

denominator for some philosophical theories of wisdom (McKee & Barber, 1999).

Many conceptualizations of wisdom in Western philosophy require an assessment of optimal performance across diagnostic situations involving life challenges (e.g., Darnell, Gulliford, Kristjánsson, & Paris, 2019). But what characteristics afford such optimal performance across a range of situations? A second fundamental challenge in wisdom-related philosophy of ethics concerns the gap between frequently theorized character competencies (e.g., compassion, empathy, humility) and their feeble predictive power for wisdom-related behavior (e.g., Darley & Batson, 1973). To fill this gap, some philosophers have recently suggested to empirically quantify the Aristotelian concept of *phronesis* or practical wisdom (Darnell et al., 2019). Phronesis-related characteristics concern the ability to adjudicate the fit between the type of strategies needed for optimal, moral functioning, and the properties of the situation at hand. Notably, empirical work on relevant processes has remained underspecified, raising the question about psychological processes that can facilitate the morally appropriate strategy-situation fit.

Psychological Foundations

Somewhat independent of the philosophical scholarship, initial psychological theorizing on wisdom concerned adult human development, focusing on the concept of maturity (Clayton, 1975; Clayton & Birren, 1980). In Erikson's (1959) influential theory of psychosocial development, wisdom was associated with the successful resolution of a final psychosocial crisis: the universal need for older adults to construct a sense of ego integrity in response to growing feelings of uncertainty that might characterize the final years of life. Through looking back over their lives, older adults evaluate their life as lived and, ideally, find a sense of acceptance, unity, and self-transcendence (Erikson, Erikson, & Kivnick, 1987). Erikson specifically argued that wisdom is the "virtue" that emerges through the successful resolution of this final psychosocial task and is the hallmark of maturity. The legacy of Erikson's theorizing was evident in the early psychological scholarship on wisdom. First, it induced researchers to think of wisdom as a new virtue exclusive to later age. Second, it framed wisdom as an ideal or optimal end state (vs. process) of development. Third, it implied that wisdom should be considered an aspect of personality. These assumptions clashed with two further earlier psychological meta-theories on wisdom which we review below, contributing to a diversity of perspectives existing today (see Table 1; also Section 2).

Another earlier stream of wisdom-related research has approached the question of maturity in terms of post-formal cognitive operations (or case-based reasoning–an inductive inferential process based on prior experiences; Schank, Kass, & Riesbeck, 1994). A central assumption here is that life is complicated and full of ill-defined challenges that do not lend themselves to clear-cut, formal solutions. Analytical skills and formal logic, often hailed as a final stage of cognitive development (e.g., Inhelder & Piaget, 1958), are not sufficient to work through such challenges, because they require a person to consider all necessary parameters prior to logically deriving a solution. When the situation is ill-defined, knowledge about such parameters is not readily available. Therefore, some developmental researchers decided to expand the focus beyond formal operations in a Piagetian tradition (Ginsburg & Opper, 1988) toward dialectical reasoning (e.g., Basseches, 1984; for review, see Grossmann, 2018). Dialectical reasoning involves recognition of limits of knowledge or intellectual humility, consideration of change and different perspectives on an issue, as well as consideration of ways to integrate diverse viewpoints. The idea of post-formal, dialectical reasoning as a cognitive feature of wisdom is present in several dominant conceptualizations of wisdom today (e.g., Baltes & Smith, 2008; Brienza, Kung, Santos, Bobocel, & Grossmann, 2018; Grossmann, 2017b; Mickler & Staudinger, 2008). Notably, the assumption of post-formal operations developing throughout adulthood is inconsistent with the Eriksonian idea of wisdom being exclusively an ideal *later life* end state. Later theories aimed to integrate Neo-Piagetian and Eriksonian ideas, construing wisdom as an advanced level of psychological maturity *throughout* adulthood, suggesting that such maturity includes prosocial motives and dialogic/dialectic reasoning style (Hy & Loevinger, 2014).

A third major foundation of the current empirical research on wisdom comes from the stream of cognitive science that concerns itself with reasoning about ill-defined or open problems using "think-aloud" methods (Ericsson & Simon, 1984). In contrast to Piagetian ideas about reasoning, which involved theoretical assumptions about the developmental process, the impact of the "think aloud" paradigm was chiefly methodological, allowing researchers to use participants' verbal reports as a proxy for the quality of their reflections (Baltes & Smith, 2008; Glück, 2018; Grossmann, 2017b; but see Nisbett & Wilson, 1977, for examples when such think-aloud protocols may not be useful).

Toward a Clear Conceptualization of Common Characteristics of Wisdom in Psychology: A Common Wisdom Model

Given the challenges of philosophical concepts of wisdom and the heterogeneity of psychological foundations of wisdom, it appears useful to consider whether there is *any* convergence across a wide range of operationalisations of wisdom in social, behavioral and cognitive sciences. Inspired by the earlier work on the common denominators of wisdom in philosophy (McKee & Barber, 1999), we sought to identify and connect common views on wisdom in empirical psychology to lay the foundation for an agreed upon theoretical framework for wisdom research.

In an attempt to identify common themes in wisdom-related psychological science and scholarship, and to help prepare us for the Toronto Wisdom Task Force meeting, we distributed a survey on major mailing lists in social and personality psychology, judgment and decision-making, as well as cognitive and moral sciences. Survey participants included representatives from Asia (China, India, Korea, Japan), the Caribbean, Europe (Finland, France, Hungary,

Table 1. Empirical approaches to measuring wisdom.

Measures	Level of analysis	Focus	Method	Measurement type	Moral aspirations?	General research question	Strengths	Weaknesses
Adolescent Wisdom Scale (Perry et al., 2002)	Trait	Person	Self-rated	Self-beliefs	Yes, as kindness, compassion, warmth, concern for environment	How do people vary in their self-beliefs on wisdom?	Ease of use; efficient	SDR
Adult Self-Transcendence Inventory (Levenson et al., 2005)	Trait	Person	Self-rated	Self-beliefs	Yes, one item "compassionate, even toward enemies"	How do people vary in their self-beliefs on transcendence?	Ease of use; efficient	SDR; only few aspects of wisdom included
Foundational Values Scale, self-focus (Jason et al., 2004, 2001)	Trait	Person	Self-rated	Self-beliefs	Yes, as kindness, compassion, warmth, concern for environment	How do people vary in their self-beliefs on wisdom?	Ease of use; efficient	SDR
Foundational Values Scale, other-focus (Jason et al., 2001)	Trait	Person	Self-rated	Perceptions of others' wisdom	Yes, as kindness, compassion, warmth, concern for environment	How do perceptions of other people's wisdom vary?	Ease of use; efficient; other-rated	SDR
Multidimensional Wisdom Scale (Schmit, Muldoon, & Pounders, 2012)	Trait	Person	Self-rated	Self-beliefs	Yes, as "Ethical sensibility"	How do people vary in their self-beliefs on wisdom?	Ease of use; efficient	SDR
Practical Wisdom Scale/Transcendent Wisdom Scale (Wink & Helson, 1997)	Trait	Person	Self- and other-rated	Self-beliefs and narrative coding	No	How do people vary in self-beliefs on wisdom? How do people vary in their application of meta-cognition?	Ease of use; efficient	SDR; low convergent validity across scales
San Diego Wisdom Scale (Thomas et al., 2019)	Trait	Person	Self-rated	Self-beliefs	Yes, as prosocial behaviors	How do people vary in their self-beliefs on wisdom?	Ease of use; efficient	SDR
Self-Assessed Wisdom Scale (Webster, 2003)	Trait	Person	Self-rated	Self-beliefs	No	How do people vary in their self-beliefs on wisdom?	Ease of use; efficient	SDR
Three-Dimensional Wisdom Scale (Ardelt, 2003; Thomas, Bangen, Ardelt, & Jeste, 2017)	Trait	Person	Self-rated	Self-beliefs	Yes, items capturing compassion and sympathy	How do people vary in their self-beliefs on wisdom?	Ease of use; efficient	SDR; many items negatively worded
Wisdom Development Scale (J. A. Greene & Brown, 2017)	Trait	Person	Self-rated	Self-beliefs	Yes, as "altruism"	How do people vary in their self-beliefs on wisdom?	Efficient	SDR; very long
Wise Thinking and Action Questionnaire (WITHAQ; Mouraitou & Efklides, 2012)	Trait	Person	Self-Rated	Self-beliefs	No	How do people vary in their self-beliefs on wisdom?	Ease of use; efficient	SDR; face-validity & comprehension questionable
Berlin Wisdom Paradigm (Smith & Baltes, 1990)	State	Situation	Observer-rated	Narrative coding	No	How do people vary in their wisdom-related knowledge?	Less biased ratings of spontaneous reflections	Labor intensive
Bremen Wisdom Paradigm (Mickler & Staudinger, 2008)	State	Person	Observer-rated	Narrative coding	No	How do people vary in their wisdom-related knowledge about the self?	Less biased ratings of spontaneous reflections	Labor intensive
Wise Reasoning (Grossmann, 2012; Grossmann et al., 2010)	State	Situation	Observer-rated	Narrative coding	Yes, focus on compromise and resolution	How do people vary in their application of meta-cognition?	Less biased ratings of spontaneous reflections	Labor intensive
Situated Wise Reasoning Scale (Brienza et al., 2018)	State	Person and Situation	Self-rated	Self-report of experiences	Yes, focus on compromise and resolution	How do situations and persons interact to produce variation in reasoning?	Ease of use; efficient; Can test effect of situations and persons	No inference of trait for single-shot observation

Note: SDR = socially desirable responding.
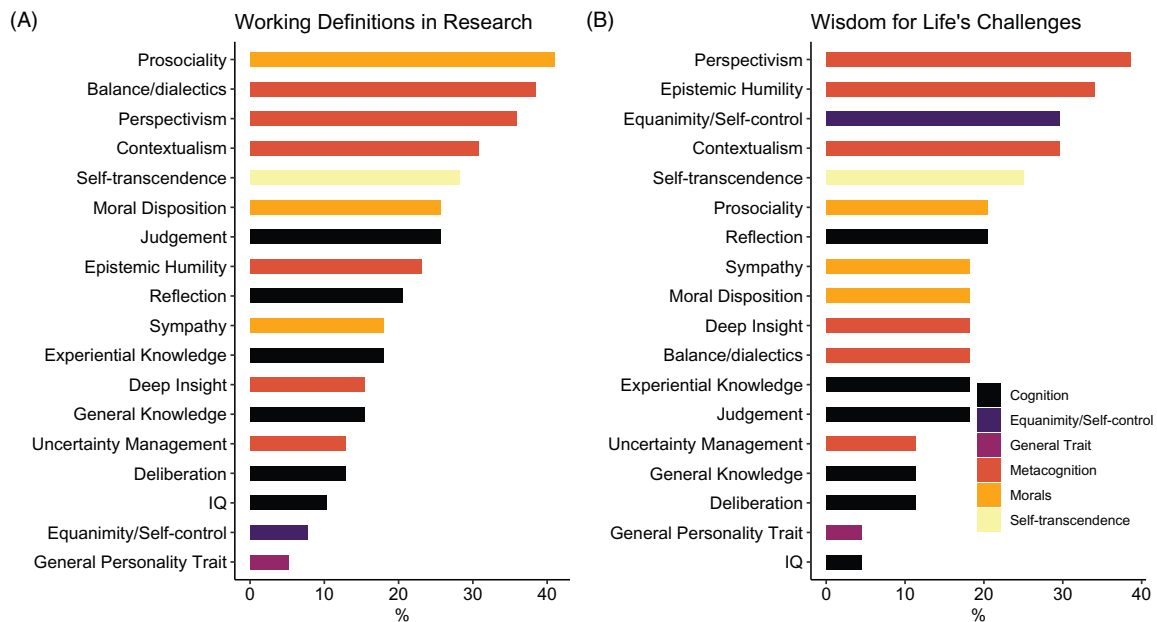
Figure 1. Different psychological characteristics spontaneously mentioned by scientists when describing their working definition of wisdom in empirical research (Panel A) and when describing key characteristics of wisdom for navigating life's challenges (Panel B). Categories are color-coded by sub-types representing cognition, equanimity/self-control, metacognition, moral aspirations, self-transcendence and general individual differences/traits. Bars represent percentages for each category.

Poland, Russia, the UK), the Middle East (Jordan, Iran), North America (Canada, United States), Oceania (Australia and New Zealand), and South America (Paraguay). Our survey included both open- and closed-ended questions that targeted vital issues in the literature. First, in an open-ended format, we asked scholars to describe their working definition of wisdom. Five participants who indicated that they do not work in the area of wisdom research were not included in this analysis. Second, we asked respondents to identify key features of wisdom for navigating life challenges and how these qualities could be developed, if possible. Here, we included all participants who provided comprehensible answers ($N = 44$). Third, we probed the experts' ideas about wisdom's relationship to three specific concepts: the common good orientation, perspective-taking, and emotional intelligence.

Subsequently, two mixed-methods scholars identified specific categories and developed a codebook for the responses (full documentation on Open Science Framework at https://osf.io/c37yh; Grossmann, Weststrate, Kara-Yakoubian, & Dong, 2019). The degree of specificity for each category was determined by the richness of the narratives. In the final step, open-ended responses were quantified by two impartial coders (over 85% agreement on each category), with disagreements resolved via a discussion between the coders and the first author.

### Working Models of Wisdom in Empirical Sciences

Figure 1A indicates how frequently each category appeared among participants in the survey. Most common themes include moral grounding (e.g., prosociality, sympathy), followed by categories concerning cognitions about cognition—i.e., meta-cognition (Nelson, 1996). Scientists characterized moral grounding both in terms of general moral attributes (e.g., prosocial orientation), as well as dominance of specific goals and tendencies (e.g., compassionate attitude, sympathy). Meta-cognitive

categories include consideration of different perspectives, search for balance between different interests, appreciation of broader context on a given issue, and epistemic/intellectual humility. The next most common category in the survey involved the psychological process of self-transcendence, followed by references to abstract qualities such as sound judgment and reflective abilities. We also examined relative percentages of each major category, adjusting for total number of categories mentioned by each participant. On average, participants mentioned less than four categories ($SD = 2.75$). Controlling for the number of categories participants mentioned, 39% concerned meta-cognition, 21% concerned moral grounding, and 7% concerned self-transcendence, whereas less than 3% concerned equanimity/self-control, and intelligence/knowledge.

Key Features of Wisdom for Navigating Life's Challenges

A similar picture emerged when examining reported key features of wisdom for navigating life's challenges, which we analyzed in the same vein as above. As Figure 1B indicates, most common categories concerned meta-cognition (epistemic/intellectual humility, consideration of different perspectives, appreciation of the broader context on a given issue), self-transcendence, and moral grounding.

Three observations can be made at this point. First, despite a conventional narrative about the multifaceted, heterogeneous nature of wisdom in psychology (e.g., Staudinger & Glück, 2011), there is a substantial degree of agreement among wisdom scholars about its central elements. Second, the most common categories involve specific aspects of meta-cognition. Third, some empirical scholars believed equanimity is central to wisdom, even though it was largely absent from empirical operationalizations (we elaborate on this point below).
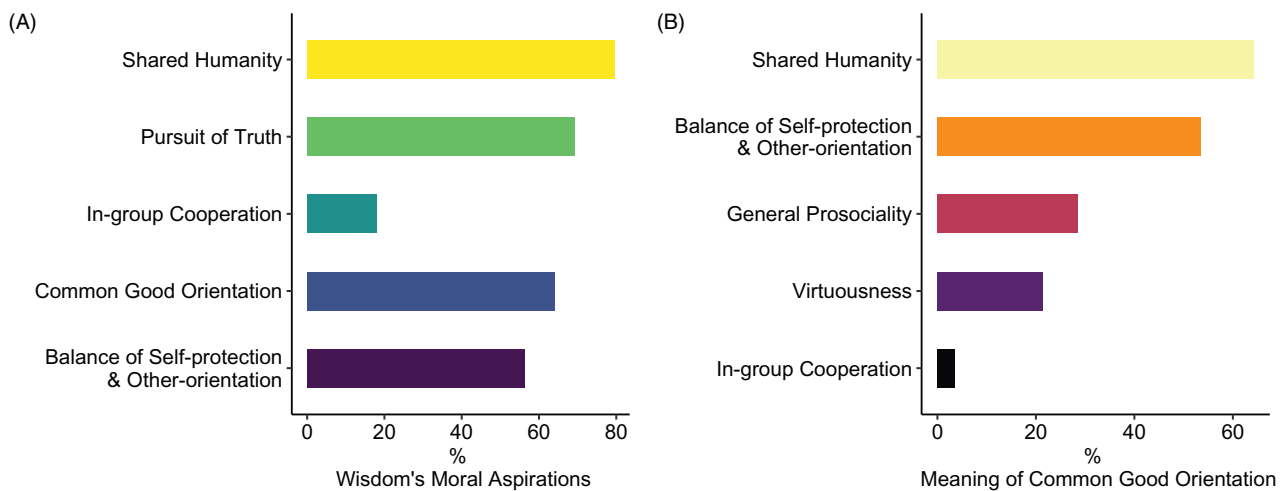
Figure 2. Moral characteristics empirical scientists associate with wisdom (Panel A) and content-analyses of spontaneous descriptions of the meaning of the "Common Good Orientation" among those scientists who selected this category (Panel B). Bar graphs represent percentages.

Wisdom, Moral Grounding and the Common Good Orientation

What kind of moral grounding do scientists associate with wisdom? In a survey, wisdom researchers checked boxes depicted in Figure 2A to indicate what aspects of morality ground wisdom. As Figure 2A indicates, the results revealed that the most common categories concerned "orientation towards shared humanity (i.e., no in-group vs. outgroup distinction)" (80%), followed by "pursuit of truth" (69%), "common good orientation" (64%), and "balance of self-protective and other-oriented interests" (56%). Given frequent references to the *common good orientation* in the psychological wisdom literature, we asked respondents to define it. As Figure 2B indicates, most wisdom researchers consider this term synonymous with the notion of shared humanity and balance of self-protective and other-oriented interests, though some also mention general virtuousness and prosocial inclinations. Very few researchers associated common good with in-group cooperation, and none associated common good with pursuit of truth.

Based on these insights, the members of the Wisdom Task Force have jointly proposed a common wisdom model for empirical sciences, zeroing in on the two most characteristic elements: meta-cognition and moral aspirations,[1] defining the common view of wisdom in empirical sciences as morally-grounded excellence in certain aspects of meta-cognition (see Appendix). Below, we speculate on the reasons for the centrality of these elements and differentiate these central features of wisdom from other cognitive, affective, and personality constructs in psychological research.

The Role of Morally-Grounded Meta-Cognition for Wisdom Research

The Centrality of Moral Aspirations

Various philosophical traditions have long viewed wisdom as central for the study of ethics. For example, the

Aristotelian perspective on practical wisdom treats it as a cardinal/master virtue helping to adjudicate between one's moral habits and their fit for different types of life challenges (Aquinas, 2006; Nussbaum, 1990; Schwartz & Sharpe, 2006; Swartwood & Tiberius, 2019). For millennia, philosophical scholars connected the concept of wisdom to the question of what is morally right or wrong to do. Academic philosophy is not alone. Examination of lay epistemologies about the core fundamentals of sound judgment suggest that in many cultures (ranging from rural Pakistan to China, to the WEIRD populations in North America; Henrich, Heine, & Norenzayan, 2010) people view socially conscious concerns as central to the notion of a wise, sound judgment (Grossmann, Eibach, Koyama, & Sahi, 2020). Given the philosophical traditions and lay epistemological tendencies to prioritize moral concerns, it seems natural that empirical wisdom researchers would prioritize moral grounding of the construct (e.g., Sternberg, 1998; Walsh, 2015; Wang & Zheng, 2014). Wisdom-related moral aspirations (see Figure 2) also reflect some of the core principles that balance the tradeoffs between certain evolutionary preferences (short-term gains, in-group favoritism, selfishness) and common ecological interests toward less selfish, institutionally efficacious behavior (Wilson, Ostrom, & Cox, 2013).

What is less intuitive is the dominance of certain aspects of meta-cognition that overall appear most common across a wide range of empirical operationalizations of wisdom. Why do wisdom measures converge on meta-cognition? To unpack this question, we will start by examining the type of meta-cognition of interest to the majority of wisdom researchers. Next, we will aim to connect these aspects of meta-cognition with their chief ostensible function.

The Centrality of Meta-Cognition: Propositional Logic vs. Perspectival Insight

To understand the centrality of meta-cognition for wisdom research, we can start by contrasting different aspects of meta-cognition and their functions. Meta-cognition involves both propositional and non-propositional processes.

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[1]Despite overall consensus, Task Force members also showed minor divergence in opinions about specific nuances of moral grounding (see "Points of Divergence" on OSF at https://osf.io/c37yh).

Reasoning, especially when verbalized, often requires propositions—i.e., abstraction-like "generalizations about people and their actions vis-à-vis objects" (Flavell & Wellman, 1975). Propositional (or Boolean) logic requires the statements to be either true or false, representing knowledge in terms of such propositions and their interconnections. Statements such as "It is dark at night" as well as compound statements such as "If you do not do your homework, you will be punished" are examples of propositional logic.

Much of the mid 20th-century empirical research on cognitive development in the Piagetian tradition and moral development in the Kohlbergian tradition has focused on propositional logic, treating it as a hallmark of mature thought. However, cross-cultural (Cole, 1995; Luria, 1931; Valsiner, 1997; Wertsch, 1985) and later 20th century developmental research (e.g., Riegel, 1976) have pointed out that propositional processes are not sufficient to capture the full understanding of cognitive development in adulthood. Moreover, later work has pointed out that abstraction-like generalizations, which are central to propositional logic, can be prone to egocentric bias (e.g., Birch & Bloom, 2007; Karniol, 2003). In turn, egocentric bias may distort one's perception of social reality (Ross & Ward, 1996; Simon, 1993). For instance, one may generate a range of propositional statements in support of one's viewpoints, convincing oneself that one's position is correct (i.e., succumbing to the myside bias; Stanovich, West, & Toplak, 2013) and widely shared among many others (see "false-consensus effect"; Ross, Greene, & House, 1977).

Developmental psychologists (Basseches, 1980; Clayton & Overton, 1976; along with cognitive scientists, e.g., Pinard, 1992) have proposed expanding the focus beyond propositional reasoning. In particular, several scholars have highlighted the complementary utility of meta-cognitive processes that allow people to flexibly shift attention across multiple propositions, affording deeper insight into the issue from different perspectives (Recanati, 2007; Tiberius, 2008; also see Pinard, 1992; Winkielman & Schooler, 2011). Such processes require meta-comprehension—the ability to reflect on the possible (in)sufficiency of one's comprehension of an issue, as well as certain meta-cognitive aspects of problem-solving. To elaborate on the latter aspects of meta-cognition, consider how one would solve a complex problem such as a social dilemma involving different interpersonal interests. The process of working through such a problem not only requires one to quickly and efficiently process information (e.g., IQ, cognitive ability), but also to mentally "step back" to appraise and rework one's plans, asking questions such as "What is my goal?" "Is the current approach working?" "What would be the best ways to approach this issue?"

Turning back to the survey results of empirical wisdom researchers (see Figure 1), it is apparent that non-propositional aspects of meta-cognition (e.g., epistemic humility, consideration of diverse perspectives, balance across different interests, insight) dominate scientific conceptualizations of wisdom. What unites these aspects of meta-cognition is that they afford greater understanding of and balance between potentially divergent interests on the issue at hand.

Here, we will describe them as *perspectival* aspects of meta-cognition or *PMC* (Figure 3; also see Kitchner, 1983; Vervaeke & Ferraro, 2013, for a similar distinction between meta-cognition and epistemic cognition).

Beyond the basic function of affording greater insight into the issue at hand, there are functionalist, ecological, and empirical arguments for the centrality of PMC for empirical conceptualizations of wisdom. We review these arguments below.

Functionalist Arguments

The Aristotelian notion of *phronesis* (Darnell et al., 2019) highlights a unique function of wisdom—understanding which actions fit which situations at hand (Schwartz & Sharpe, 2006). Achieving such fit benefits from seeing through illusions (a common denominator across a range of philosophical perspectives on wisdom; McKee & Barber, 1999), transcending the veil of personal perspective through which we perceive events in front of our eyes. Theoretically, aspects of PMC such as recognizing the limits of one's knowledge, being open-minded to diverse perspectives, and being willing to consider ways to integrate them theoretically function as bias-correcting checkpoints, enriching a person's understanding of the situation at hand. Thereby, PMCs allow one to see through illusions by avoiding self-deception and related egocentric biases such as confirmation bias (Nickerson, 1998) or fundamental attribution error (Ross, 1977) that may arise when facing personal challenges (Plato, 2000; Ross & Ward, 1996).

Importantly, PMC is required to implement wisdom-related moral aspirations. On their own, moral aspirations such as fairness, justice, loyalty, or purity (Graham et al., 2011; Shweder, 1990) are abstract concepts, void of the pragmatic nuances necessary to implement moral concerns in a person's life. Morality on its own appears to have no distinctive cognitive mechanisms (Greene, 2015). Without PMC, the integration of moral concepts into daily decision-making would require a top-down, propositional process, which would be both costly and often implausible. For instance, consider a social conflict involving considerations of both justice and loyalty:

> You are the best man at your brother's wedding. You are bringing the wedding rings. The wedding is taking place in another city and your only chance to get to the wedding on time is to board the next train. Upon arriving at the train station, you notice that your wallet and your cell phone are missing. There is no time to talk to the police and other people at the station refuse your requests to use their phone or lend you money to call your brother. Desperate, you sit down on a bench in the main hall. You notice that the well-off person sitting next to you takes a phone call, stands up and walks around the corner to talk in private. Left on the bench is the man's expensive jacket. You suddenly notice a ticket for your train half sticking out of this jacket. You could easily take this ticket without anybody noticing. It also appears this man could buy a replacement without any problems, as the train is half-empty. What should you do? (Adapted from Miller, Bersoff, & Harwood, 1990)

In situations like this, merely focusing on logical propositions for justice (e.g., "Stealing is an unjust crime") would
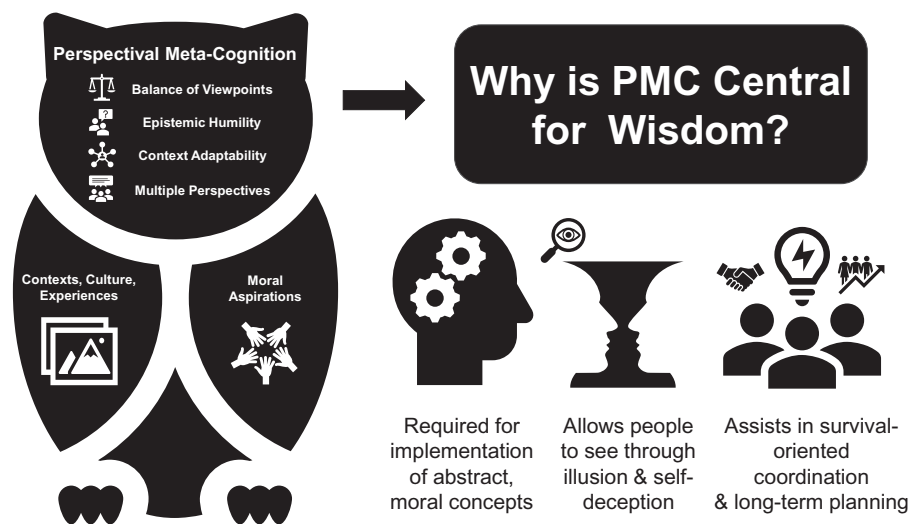
Figure 3. Visual depiction of the common wisdom model, representing the consensus among empirical wisdom scientists. Central to wisdom are aspects of perspectival meta-cognition, which are grounded in moral aspirations and specific socio-cultural contexts and experiences.

ignore the considerations of loyalty and vice versa. Propositional logic would also not allow a person to integrate the critical information concerning how they feel about different decision alternatives, making it a poor substitute for typical ways humans work through such dilemmas (e.g., Haidt, 2001; Shweder, Mahapatra, & Miller, 1987). Integration of relevant abstract moral concepts such as justice or loyalty into human decision-making requires their grounding in specific language, culture, emotions, as well as physiological and introspective experiences (e.g., Shea, 2018). Such grounding requires the person to augment the consideration of moral concepts with PMC, with an eye on the concrete details of the situation the person is facing.

Ecological Arguments

Theories in evolution and ecological psychology suggest that human survival has long depended on the ability to adapt to and navigate one's environment. Theoretical work particularly highlights the evolutionary advantage of prospection (Railton, 2016) and aspects of social cognition that promote shared intentionality (Call, 2009) and allow for efficient coordination of group efforts (Hare, 2017; Moll & Tomasello, 2007). Especially in resource-scarce environments such as when facing a harsh winter, the ability to prospect—e.g., to consider multiple ways for one's family to survive—may have provided an evolutionary advantage. Survival in such environments also depends on in-group cooperation (Hammond & Axelrod, 2006; Requejo & Camacho, 2013; Tomasello, Melis, Tennie, Wyman, & Herrmann, 2012), which requires the ability to consider different viewpoints and to reconcile them with one's own viewpoint (i.e., to mentalize; Narvaez, 2014; Tomasello, 2014). The co-evolution of prospective and mentalizing abilities may have contributed to their centrality among the common aspects of wisdom.

PMC may also be advantageous when working through the social dilemmas humans tend to face in their lives, namely the "conflict between immediate self-interest and longer-term collective interests" (Dawes, 1980; Van Lange, Joireman, Parks, & Van Dijk, 2013). Since the dawn of humankind, the ability to work through social dilemmas has been critical for human survival. Should one contribute to societal well-being and care about future generations, even though it comes at the cost of personal benefit? PMC can help to work through such dilemmas in a balanced (vs. biased) fashion, allowing a person to reflect on multiple issues at stake and consider moral principles relevant to a dilemma (Grossmann & Brienza, 2018). PMC can override the immediate impulse to protect self-interests (Grossmann, Brienza, & Bobocel, 2017), augmenting propositional tendencies by allowing comparison across multiple propositions and moral principles (e.g., family security vs. societal well-being).

In other words, the common wisdom model highlights critical aspects of cognition, which so far have not been adequately captured by other constructs (e.g., IQ, rationality) and may provide unique benefits for individual and relational well-being, helping to work through social dilemmas in a prosocial manner.

Psychometric Arguments

Beyond the speculative conjecture about the role of PMC for ecological adaptations, empirical research from the last two decades has documented that PMC aspects of wisdom tend to go hand-in-hand, often making up a single latent factor. PMC can be further discriminated from established individual difference constructs and appears to be morally grounded, providing convergent validity through positive associations to prosocial attitudes and common-good concerns.

Pertinent to the question of convergence of the PMC characteristics, psychometric models with a single latent factor across these aspects of meta-cognition appear to show superior fit compared to multi-factor models (Brienza et al., 2018). The convergence of the PMC components on a single factor is also evident in daily diary reports on the most significant challenges of the day (Grossmann, Gerlach, & Denissen, 2016). Moreover, randomized control trial studies show that experimental instructions to apply one meta-cognitive strategy (e.g., self-transcendence) can lead to

temporary activation of another strategy (e.g., consideration of different ways a situation may unfold; Grossmann & Kross, 2014; Kross & Grossmann, 2012). In a similar way, instructions to engage in prospection facilitate activation of PMC aspects related to mentalizing (Huynh, Yang, & Grossmann, 2016), providing empirical evidence for the connection between prospection and mentalizing aspects of PMC.

Speaking to the discriminant validity of the PMC, several studies have documented that PMC aspects of wisdom share a unique nomological network that cannot be sufficiently accounted by established measures of personality, intelligence, empathy or other individual difference constructs (Ardelt, 1997; Brienza et al., 2018; Grossmann, Na, Varnum, Kitayama, & Nisbett, 2013; Staudinger, Lopez, & Baltes, 1997; see more discussion on this distinction below). Finally, speaking to the convergent validity of the PMC, empirical evidence suggests that PMC is closely linked to prosocial attitudes and intentions in the context of conflicts between individuals (Brienza et al., 2018) and groups (Brienza, Kung & Chao, in prep). Further, studies on the function of deliberation for prosocial intentions and cooperative behavior indicate that PMC (both as individual difference and when experimentally activated) uniquely promotes cooperation as a function of deliberation (Grossmann et al., 2017). Moreover, accumulating evidence suggests that central aspects of wisdom, especially PMC, have unique benefits for relational and individual well-being, even when controlling for intelligence and Big Five personality traits (Ardelt, 1997; Ardelt & Jeste, 2016; Bergsma & Ardelt, 2012; Grossmann et al., 2013; Peetz & Grossmann, in press; Santos & Grossmann, 2020).

Together, functionalist, ecological, and psychometric arguments point out the adaptive features of perspectival meta-cognition (PMC) for social coordination and individual and group well-being. Moreover, PMC appears to uniquely fulfill the chief mandate of practical wisdom, which involves deeper understanding about how to live well (Tiberius, 2008) and how to work through challenging life matters.

Distinction of the Common Wisdom Model from Related Constructs

So far, we have established a common wisdom model, suggesting that central to most definitions and operationalizations of wisdom in social, behavioral, and cognitive sciences is the combination of moral aspirations with aspects of PMC. Establishing a common denominator model of wisdom, we can now proceed to differentiate the construct from potentially-related individual difference constructs.
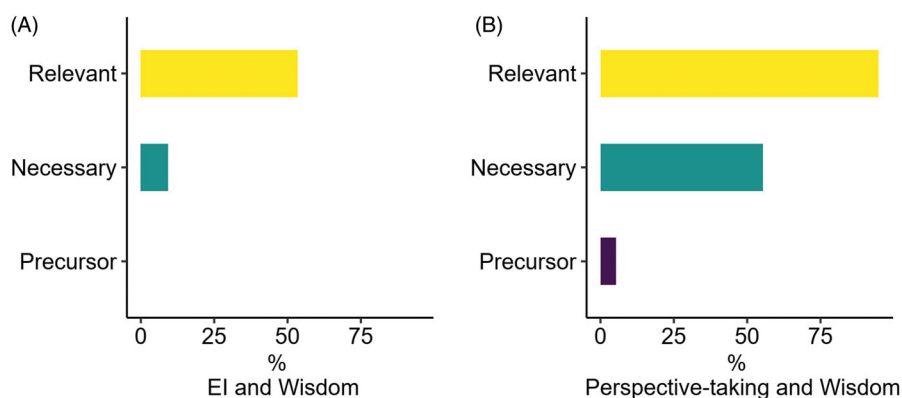
Intelligence

Positions on the nature of intelligence vary (Gardner, 2011; Neisser et al., 1996; Nisbett et al., 2012). However, the mainstream view of intelligence—the Intelligence Quotient (IQ)–focuses on the general ability to reason, plan, think abstractly, and learn quickly from experience (Gottfredson, 1997; Nisbett et al., 2012). This view distinguishes between crystallized intelligence, g(C), which includes knowledge about the world and learned operations that can be used to solve problems (e.g., arithmetic rules), and fluid intelligence, g(F), which concerns solving novel problems with little help from learned knowledge (e.g., identifying patterns/rules among geometric figures on the Raven's Progressive Matrices; Blair, 2006; Horn & McArdle, 2012). Contemporary IQ tasks build on the idea that the hallmark of intelligence involves propositional logic, assessing one's ability to think abstractly and make quick and efficient decisions. In contrast, central aspects of wisdom-related PMC reviewed above involve stepping beyond formal operations and rule-based logic to balance abstract thinking with an understanding of the nuanced meaning of the concrete situation at hand. Though a minimal degree of intelligence is necessary for information processing, knowledge acquisition, and tasks requiring executive control, higher IQ is not enough to facilitate higher wisdom. Indeed, research suggests that IQ performance (e.g., cognitive reflection task; Frederick, 2005; active open-minded cognition; Stanovich & West, 2008) is a weak predictor of performance on tasks assessing aspects of wisdom reviewed above (e.g., Brienza, Pennycook, & Fugelsang, in prep; for other aspects of wisdom-related meta-cognition, see Grossmann et al., 2013; Staudinger et al., 1997). Further, IQ is not consistently related to the moral features mentioned by wisdom researchers (e.g., cooperation; Chen, Chiu, Smith, & Yamada, 2013; Yamagishi, Li, Takagishi, Matsumoto, & Kiyonari, 2014). Therefore, wisdom scholars typically view IQ as a necessary, but not sufficient condition for wisdom.

Rationality

Hallmarks of rationality include goal-orientation, consistency, and the use of evaluation and reflection in decision-making. In game theory, rationality further focuses on rule-based preference maximization and constraint satisfaction, oriented toward solving well-defined problems for which parameters are known (Russell & Norvig, 2016; Stanovich, 2009). Given this definition, rationality shares some family resemblance with certain aspects of wisdom, but also substantial divergence. Rationality is similar to wisdom-related aspects of meta-cognition, as both involve certain goal-orientation, and both are evaluative and reflective. However, in contrast to rationality, wisdom is commonly invoked for working through ill- (rather than well-) defined problems, for which many parameters are unknown. Consequently, whereas rationality is rule-based and abstract, wisdom requires operations that flexibly balance rule-based and pragmatic concerns at hand (Darnell et al., 2019; Grossmann et al., 2017). Empirical evidence supports this dissociation, indicating that typical measures of rationality only weakly, or even negatively, relate to aspects of wisdom reviewed above (Brienza et al., in prep; Brienza et al., 2018; Staudinger, Lopez, & Baltes, 1997).

Figure 4. Scientists' views on the relationship between wisdom and Emotional Intelligence (Panel A)/Perspective-taking (Panel B). Content-analyzed narratives are categorized as broadly relevant, necessary, or a precursor for wisdom. No person viewed EI/Perspective-taking as sufficient for wisdom.

Emotional Intelligence

Some researchers have argued that wisdom and emotional intelligence—i.e., the ability to perceive, understand, express, manage, and use emotions (Mayer & Salovey, 1997)—are conceptually overlapping constructs (e.g., Greaves, Zacher, McKenna, & Rooney, 2014; Zacher, McKenna, & Rooney, 2013). Others have suggested that understanding this association in detail might be a useful venture (Kunzmann & Baltes, 2003). To probe these ideas, we asked participants in our survey of wisdom researchers for their thoughts about this relationship. Interestingly, none of the experts believed that emotional intelligence was sufficient for wisdom and no respondents felt that emotional intelligence was a developmental precursor to wisdom (see Figure 4A). Only a small proportion thought it was a necessary component of wisdom. A slight majority of respondents felt that emotional intelligence was relevant to wisdom. These results suggest that, at most, scholars view emotional intelligence as a correlate of wisdom. Some respondents pointed out that wisdom is a higher-level concept than emotional intelligence, and that certain characteristics of emotional intelligence—in particular, the regulatory aspects—can be subsumed by the construct of wisdom. Other respondents expressed doubt in the construct of emotional intelligence altogether, suggesting that "emotional competencies," rather than emotional intelligence, are integral to wisdom (Kunzmann & Glück, 2018).

Perspective-Taking

Several conceptualizations of wisdom in empirical sciences consider the capacity to recognize and coordinate the differences in people's perspectives to be an important criterion of wisdom (Baltes & Staudinger, 2000; Grossmann et al., 2010; Sternberg, 1998). Indeed, results of the survey of wisdom researchers in Figure 4B revealed that most scholars (90%) view perspective-taking as relevant to the broader construct. At the same time, most researchers did not identify perspective-taking as a precursor to wisdom, suggesting that they thought of it as an integral component of wisdom rather than as an antecedent. Moreover, while over 50% of researchers identified perspective-taking as necessary for wisdom attainment, none deemed it sufficient. In sum, experts in the field think of perspective-taking as an

essential component of wisdom but one that does not entirely capture the construct on its own, i.e., without the integrative process. Importantly, perspective-taking in the empirical wisdom research (see below) tends to be operationalized differently from how it has been operationalized in research on theory of mind, and these two operationalizations have been found to be relatively uncorrelated and to follow different developmental trajectories (Rakoczy, Wandt, Thomas, Nowak, & Kunzmann, 2018).

Section 2. What Do Wisdom Measures Test and How Well Do They Test It?

So far, we have identified the common wisdom model, suggesting that central to the psychometrically oriented operationalizations of wisdom in psychology are moral aspirations (e.g., common good orientation, orientation toward shared humanity) and PMC (e.g., intellectual humility, balance of diverse viewpoints, consideration of diverse perspectives and broader contexts than the issue at hand). Given that there are common notions across perspectives on wisdom that can provide the basis for a model in psychological science, we now turn to evaluating existing approaches to measurement of these qualities. We will start by reviewing three major measurement-related themes (focus on persons and personalities, focus on how a person thinks in challenging situations, and focus on dynamic integration of personality and social context). Next, we will classify most published approaches to empirical wisdom measurement in terms of main focus, level of analysis, level of measurement, strengths and limitations. We will pay particular attention to challenges when measuring psychological characteristics of the common wisdom model. Finally, we will propose several best practices necessary to move the field forward.

Review of Major Empirical Approaches

Major existing operationalizations of wisdom are guided by distinct meta-theoretical assumptions about where wisdom is to be located—in persons, in their knowledge and reasoning, the manifest choices or actions following such reasoning, and/or in contextualized psychological processes.

Though most research acknowledges the importance of conceiving of wisdom in each of these domains, there is some debate about their centrality. Below we review these meta-theoretical assumptions and their methodological implications.

Wisdom as Manifest in Who a Person Is: Emphasis on Persons and Personalities

One perspective suggests that wisdom is embodied as a constellation of personality characteristics (Kramer, 2003; Staudinger, Dörner, & Mickler, 2005), across multiple levels of functioning. Following McAdams and colleagues (McAdams, 2013; McAdams & Olson, 2010), personality can be understood from three different standpoints or levels, each of which layers upon the next to afford an incrementally more detailed understanding of human development. People first enter the world as social actors, with behavioral consistencies that become elaborated over time into general, internal, and comparative personal dispositions we later recognize as personality traits. At this level, wisdom has frequently been associated with the *traits* of openness to experience, intellectual humility, and tolerance of ambiguity (also see Section 3 for a fuller discussion of trait vs. state views on wisdom). By the end of childhood, people have become motivated agents, with *goals and values* that become consolidated through the exploration and commitment to various personal life projects. At this level, wisdom has been associated with deep interests in knowing the truth and with compassionate concerns for others' welfare. By adolescence and emerging adulthood, people have become autobiographical authors, with organized recollections of the past that give rise to a sense of personal identity. At this level, wisdom has been associated with *autobiographical processes*, including reflectivity, the willingness and ability to take different perspectives, and self-transcendence. Following Erikson's earlier ideas (1964), a wise person is thought to represent an ideal endpoint of human development and wisdom is a significant indicator of psychological maturity.

At least three of the most common contemporary measures of wisdom in empirical science fit within the person-centric framework (see Table 1). The Three Dimensional Wisdom Scale (3 D-WS; Ardelt, 2003), the Self-Assessed Wisdom Scale (SAWS; Webster, 2003), and the Adult Self-Transcendence Inventory (ASTI; Levenson, Jennings, Aldwin, & Shiraishi, 2005) each aim to capture general characteristics of wisdom. These are questionnaire-based measures that ask participants to respond to self-report question items or statements about the self on Likert-type scales. As with all such self-report measures, these instruments require accurate self-appraisal and resistance to various kinds of reporting biases and memory issues.

Wisdom as Manifest in How a person Thinks and Acts in a Challenging Situation: Emphasis on Cognition and Meta-Cognition

Another perspective suggests that wisdom reflects what a person knows about life and how a person reasons through life-related problems. In this view, a person is described as wise if they have a specialized body of broad and deep knowledge that facilitates reasoning through difficult life dilemmas. This knowledge might include, for example, insight into human nature, one's experiences and motives, relationships, and lifespan contextualism. Knowledge is not enough on its own—its utility for producing wisdom depends on how it is used in the service of formulating a solution. For example, wise people seek to understand the context in which a problem is embedded, they explore different possibilities for how an event might unfold, and they endeavor to balance multiple interests through searching for compromise. Notably, the wise person's knowledge and reasoning depends on epistemological assumptions about what can be known about a particular issue. For example, wise people understand that values are relative, that certainty is rarely absolute, and that contradiction is inherent to life.

As Table 1 indicates, this perspective is also widespread, and has stimulated the use of performance (vs. self-report questionnaire-based) measures. Baltes and colleagues who use the Berlin Wisdom Paradigm (BWP) conduct in-person interviews to assess people's cognitions (i.e., knowledge or content) about how they would approach specific hypothetical interpersonal dilemmas. In a similar vein, Grossmann and colleagues (e.g., Grossmann & Kross, 2014; Grossmann et al., 2013, 2010) draw on the BWP to assess reasoning about interpersonal or group dilemmas. They focus on the PMC components embedded in the process of reasoning, as well as certain prosocial considerations (conflict resolution and compromise). In both of these performance measures, trained experts score participants on their respective foci. These methods build on the idea that wisdom involves an understanding of human nature and relationships, the pragmatics of navigating life challenges, and/or whether they show evidence of using PMC in their reflections.

Wisdom as Manifest in Where a Person Is Situated: Dynamic Integration of Personality and Social Context

A third, more recent perspective attempts to go beyond individual differences. Rather, it highlights the role of social context in the dynamic interplay of personal dispositions, experiences, and culturally-embedded situational factors such as the language that is used for the expression of wisdom-related characteristics (Table 1). Empirical research from this perspective highlights systematic intra-individual variability in the characteristics highlighted in person- and thinking-based perspectives as a function of situational factors (e.g., Brienza et al., 2018; Grossmann, 2017b; Grossmann et al., 2017; for a review, see Grossmann, Dorfman, & Oakes, 2020). These findings therefore advocate for a deeper consideration of ecological factors as part of the wisdom-enhancing and wisdom-inhibiting systems. Building on Aristotelian idea of practical wisdom (Darnell et al., 2019; Schwartz & Sharpe, 2010), this perspective also emphasizes the importance of fit between a given action and its situational utility for producing wisdom (Grossmann, Dorfman, et al., 2020).

The situation-centric perspective is relatively recent and can be related to other situation-centric views of reasoning such as the Construal Level Theory, in which the level of processing entailed by a specific situation changes with psychological distance from the situation (Liberman, Trope, & Stephan, 2007). To understand how individual differences, reasoning, and various contexts interact to produce elements of wisdom requires a state-level measure that is adaptable to different situations. Brienza and Grossmann (Brienza et al., 2018) designed the Situated Wise Reasoning Scale (SWiS) to accommodate the idea that wisdom is dynamic (e.g., a person's reasoning differs across time and situations), and context-dependent (i.e., situations afford or constrain reasoning), and to test how people flexibly adjust their reasoning to the situation. This measure asks people to reflect on a situation (e.g., interpersonal, workplace, or societal conflict) and respond to Likert-type question items regarding the extent to which they used PMC in their reflection.

Challenges of Measuring Wisdom

Each of the reviewed measures has their unique strengths and challenges. The person-centered methods (3D-WS; SAWS; ASTI) are efficient. However, because they ask people to rate themselves on socially desirable global characteristics (e.g., "Before criticizing somebody, I try to imagine how I would feel if I were in their place") they are susceptible to memory distortion and biased responding—both of which are antithetical to the idea of wisdom as seeing through illusion and biases (Assmann, 1994). Social desirability is particularly pronounced for moral aspirations central to wisdom because most people wish to perceive themselves, and to be perceived as, better than they actually are (e.g., Brown, 1986; Kruger & Dunning, 1999). Moreover, general self-assessments of PMC are challenging because of self-insight bias (Vazire & Carlson, 2011): It is challenging to assess one's personal tendency to be intellectually humble, empathetic, or open-minded. Higher self-reports of general tendencies to engage in PMC may under circumstances lead to ignorant or narcissistic claims of being the wisest (most humble, empathetic, or open-minded) person in the room.

The thinking-centric methods are less susceptible to biased responding because trained observers score them. However, such methods require much more time and effort to administer, code, and score responses. Because participants must also rely on their verbal abilities to respond, thinking-centric methods might end up producing spurious associations between wisdom and domain-general cognitive ability. Moreover, some of the thinking-centric methods (e.g., BWP and Bremen Wisdom Paradigm) fail to capture aspects of wisdom concerning moral aspirations (Ardelt, 2004; Glück, 2018). Further, the predictive ability of such methods may be limited to downstream wisdom-related behaviors within the same context and not to novel contexts or domains. Likewise, a main weakness of the SWiS method is that one-time assessments are relatively less informative of one's general tendencies and require aggregation across multiple measurement points to infer trait-level PMC.

Best Practices for Measuring Wisdom

The optimal choice of measure for assessing common aspects of wisdom depends on the research question (see Table 1). Is one interested in general tendencies or situation-specific expression of the construct? Is one interested in self-views or overt performance? Does one want to make predictions about future performance? Person-centric measures are useful for assessing general tendencies, but they are inappropriate for predicting performance. On the other hand, situation-centric measures can speak to performance in a given situation, but they do not provide insights about how a person views their wisdom in general. Given substantial cross-context variability in common aspects of wisdom (see Section 3 below), generalizations about a person's average wisdom cannot be achieved through single-shot observations on person-centric measures. Such understanding requires several observations across a range of situations and experiences. The Wisdom Task Force further recommends the use of multi-situation instruments in the laboratory, as well as diary and experience-sampling methods, to obtain a fuller picture concerning people's potential for wisdom and the extent to which individual differences in wisdom are grounded in biological, experiential, and socio-cultural factors (Grossmann, 2017a).

Section 3. How and Why Do Individuals Differ in Wisdom?

Establishing the common wisdom model has allowed us to systematically classify most peer-reviewed empirical measures for wisdom to date. The centrality of perspectival meta-cognition (PMC) and moral aspirations for the common wisdom model in psychology also has implications for understanding the relative contributions of individual differences and situations for producing variation in wisdom. In this section, we first discuss the relationship of traits and states broadly (including the reliabilist, situationist, and density distribution approaches to epistemic and moral virtues), which have direct relevance to the construct of wisdom. Next, we consider potential sources of individual differences in wisdom, including the role of dispositions and experiential factors (e.g., the role of adversity). Finally, we turn our attention to the role of situational factors for the expression of wisdom.

To avoid possible confusion, we would like to preface this section: Though some wisdom researchers believe that fully-formed wisdom is quite rare (Baltes & Smith, 2008), the common view position on wisdom among the Wisdom Task Force members is that people differ in central aspects of wisdom on a continuum that reflects more or less ability to manifest wisdom. In other words, the common wisdom model we outline here suggests that wisdom is a dimensional construct rather than an all-or-none quality.

State vs. Trait Wisdom

Philosophical claims about wisdom and other virtues typically involve the assumption of cross-situational reliability

(Alfano, 2012; Doris, 2002; Miller, 2017). For empirical psychology, the reliability assumption suggests the idea of a cross-situationally stable disposition or a *trait*. A trait assumption is common to many psychological constructs, including mainstream views on intelligence (e.g., Neisser et al., 1996; Nisbett et al., 2012) and personality (Funder, 2008). In this view, people have a certain "amount" of wisdom that differs from other people and generalizes across different situations. In contradistinction, psychological constructs can also be conceptualized as *states*—specific expression of a given characteristic, independent of the question about its cross-situational stability. Many psychological constructs, especially in social and experimental psychology, can be conceptualized as states (e.g., excitement; fatigue; insight). The state view takes the perspective that different situations can afford or constrain wisdom across different people. Moreover, given that people's reasoning about social situations is dependent on situation-specific knowledge and expertise, there may be domain-based differences in the manifestation of wise reasoning (e.g., the mathematician who has problems balancing a check book, or the wise oncologist who may not be a wise parent).

Dominant measures of psychology aim to capture either traits (person-centric measures in Table 1) or states (situation-centric measures in Table 1). Notably, from an epistemological standpoint, traits can only be inferred through measurement of specific observations—captured in self-views, reported reasoning tendencies, or third-party observations of behavior. In other words, none of the operationalizations of wisdom measure *trait* wisdom per se. This insight becomes particularly salient when considering the core aspects of wisdom in detail. Though moral aspirations can have a reliable base, the salience of such aspirations may vary dramatically across situations (e.g., Bateson & Darley). Even more so, PMC is a priori a state-level construct and shows dramatic variability across daily life situations (Grossmann, Gerlach, et al., 2016; Santos, Huynh, & Grossmann, 2017). Indeed, some studies show that stable personality measures leave large unique variance unaccounted for in predicting PMC-related scores (Staudinger et al., 1997).

Nevertheless, the observation of significant cross-situational variability in core aspects of wisdom does not necessarily present a problem for psychological constructs, as long as one remains mindful of the inferences that different measures of wisdom aim to provide (see "best practices" in Section 2). Indeed, the degree of variability in PMC is not much larger than what is typically observed for established aspects of personality, with test-retest studies suggesting small-moderate degree of stability over time (Brienza et al., 2018; Grossmann & Kung, 2018).

One can further improve such reliability by performing an intra-individual aggregation of responses across multiple measurement points (e.g., Grossmann et al., 2016). Overall, the observation of both cross-situational variability across measurement points and test-retest stability over longer timeframes suggest that central aspects of wisdom in fact have a reliable trait component, but this trait component may be challenging to assess through single-shot measurements. As with other psychological constructs wisdom appears to have both trait and state components—features of both the person, how they think and reason, and the situation itself can interact to afford or constrain wisdom. Indeed, one study revealed that both state and trait components of wisdom showed unique predictive variance (Brienza et al., 2018, Study 7).

As argued by proponents of density-distribution models for understanding individual differences in personality (e.g., Fleeson, 2001; Fleeson & Jayawickreme, 2015), trait wisdom may be represented through data-intensive longitudinal observations of states. The density-distribution model also has implications for reliabilist claims about wisdom in philosophy. Specifically, reliabilist claims may be satisfied as long as people remain consistent across comparable situations (i.e., if the person shows a systematic pattern of response in the face of comparable situational contingencies; Fleeson, 2001; Mischel & Shoda, 1995; Mischel, Shoda, & Mendoza-Denton, 2002).

Sources of Individual Differences

Dispositional Factors

Individual differences in wisdom result, in part, from underlying personality traits and processes that support (or thwart) the development of wisdom through life experience. For instance, the MORE Life Experience Model (Glück & Bluck, 2013; Glück, Bluck, & Weststrate, 2019) argues that five "psychological resources" dynamically interact to promote growth in wisdom through the successful navigation of fundamental life challenges. These personal resources include: Managing life's uncertainty and uncontrollability, Openness, Reflectivity, Emotional Sensitivity, and Emotion Regulation. In Webster's H.E.R.O.(E.) model (Webster, Weststrate, Ferrari, Munroe, & Pierce, 2018), openness to experience is argued to play a role in determining the likelihood that a person will encounter wisdom-fostering events over the course of their life. In support of both models, studies have consistently documented low to moderate positive associations between common aspects of wisdom and openness to experience (Brienza et al., 2018; Glück et al., 2013; Staudinger et al., 1997).

At the level of personality processes, exploratory self- and life-reflection is viewed as necessary for constructing wisdom from life experience (Weststrate, Ferrari, Fournier, & McLean, 2018). Research has shown that the depth of an individual's reflective processing, as demonstrated in narratives of difficult life events, predicts both self-report and performance measures of wisdom (Webster et al., 2018; Weststrate et al., 2018; Weststrate & Glück, 2017). Such reflective processing is generally considered to be a stable aspect of personality, particularly within the context of specific event types, such as difficult life experiences (McLean, Pasupathi, Greenhoot, & Fivush, 2017).

The relationship between wisdom and mainstream measures of intelligence appears complex. Whereas low positive correlations have been found between PMC and crystallized

intelligence, researchers have varyingly found positive, negative, curvilinear, and nonsignificant associations between wisdom and fluid intelligence (Glück et al., 2013; Grossmann et al., 2013; Mickler & Staudinger, 2008). There is growing consensus that the relationship between wisdom and intelligence is best understood from a threshold perspective. That is, a certain amount of intelligence is necessary for wisdom, but beyond that, intelligence provides little added value.

Experiential Factors

Folk beliefs attribute the development of wisdom to accumulation of life experience. Similarly, some researchers have argued that wisdom might represent an ideal form of growth through adversity (Aldwin & Levenson, 2004; Ardelt, 2005 Ferrari & Munroe, in press; Joseph & Linley, 2005; Plews-Ogan, Ardelt, & Owens, 2018; Tedeschi & Calhoun, 2004; Williams, Mangelsdorf1, Kontra, Nusbaum, & Hoeckner, 2016). The general logic of this argument follows this storyline: (a) adverse life events disrupt people's core beliefs and shatter their assumptions about the world; (b) through accommodative (not assimilative) processing, people revise their self-concepts and worldviews to more accurately reflect reality (Joseph & Linley, 2005); and (c) in optimal circumstances, new schemas emerge, representing growth in wisdom.

Corresponding empirical evidence concerning the role of adverse experiences for the development of common aspects of wisdom has painted a more complex picture than anticipated from folk beliefs and initial theoretical arguments. Mickler and Staudinger (Mickler & Staudinger, 2008) found that, across one's lifespan, experiencing a moderate number of life events that caused self-reflection is a stronger predictor of wisdom than experiencing too many or too few such events. Moreover, most of the research on growth after experiencing traumatic adverse experiences (Tedeschi & Calhoun, 2004) has relied on retrospective reports on samples of people who are willing to talk about their past experiences, limiting inferences about the *prospective* role of challenging life experiences for development of wisdom (Blackie & Jayawickreme, 2015). Recent studies that employed prospective longitudinal designs have further revealed that the role of adverse experiences for development of wisdom-related characteristics over a course of a year depends on the processing of adverse experiences: Whereas taking an observer perspective on the experience propels growth in wisdom, immersing oneself into the adverse experiences appears to limit one's expression of wisdom over time (Dorfman, Moscovitch, Chopik, & Grossmann, 2020).

Overall, the emerging picture seems to be that while adversity might be especially likely to stimulate wisdom-fostering processes, it is not necessarily the case, and that a moderate number of positive or negative life challenges might be the optimal experiential context for wisdom development. While promising, this area remains significantly under-researched and calls for further longitudinal studies that can circumvent the limitations of past retrospective studies.

The Power of the Situation for Wisdom

In contrast to the inconclusive role of experiential factors for wisdom, the role of situational factors appears systematic and robust. In particular, the degree to which a person focuses on the social context as opposed to the self appears to play a central role for expression of characteristics depicted in the common wisdom model (Figure 3). For instance, reflecting on a scenario in which someone transgressed on a close friend is more wisdom-fostering than reflecting on a scenario in which someone transgressed against you (Grossmann & Kross, 2014). Similarly, being placed in the position of providing advice to others, as opposed to deliberating on one's problems or talking about it with another person, tends to heighten PMC (Huynh, Santos, Tse, & Grossmann, 2017). Together, these studies suggest that expression of wisdom is heightened when people focus on other people's problems rather than their own. Moreover, these results suggest that people's capacity for wisdom is often higher than suggested by observations of wisdom in their own lives (Grossmann, 2017a), inhibited by egocentrism common to personal-life situations. This insight has been supported by empirical evidence showing that mental strategies reducing self-focus boost wisdom performance (Grossmann & Kross, 2014; Kross & Grossmann, 2012).

Section 4. How Do Individuals Develop Wisdom?

Upon establishing and differentiating the common wisdom model in Section 1, evaluating the strength and challenges of existing measures of the common wisdom model in Section 2, and evaluating the role of dispositional, experiential and situational factors in Section 3, we will now turn to a question of great relevance to educators, counselors, and gerontologists alike—how do individuals develop wisdom? Here, we first start by unpacking the frequently invoked folk belief that wisdom comes with age, reviewing relevant evidence. Next, we will shift our focus to educational attempts to foster psychological characteristics of the common wisdom model. We will also return to the survey of scientists employed in Section 1 to establish the common wisdom model, to contrast common beliefs about the development of wisdom among scientists with rather weak empirical evidence from actual studies. We will conclude by discussing emerging training-based attempts to focus specific aspects of PMC and moral aspirations of the common wisdom model.

Wisdom and Aging

Some earlier theories attributed wisdom-related psychological characteristics to later adulthood (e.g., Erikson, 1950; Hall, 1922), consistent with the folk adage that "with age comes wisdom." It is noteworthy that the lay theories linking wisdom with older age are likely based on a very different conception of older age than today: As recently as the 19th century, the average life expectancy in many parts of the Western world covered around 30-40 years of age, with even lower estimates for other time periods of human

history (e.g., Galor & Moav, 2005). Even half a century ago, the average life expectancy in North America was at least a decade shorter (Prentice, 2008). Changes in life expectancy over the past hold even when accounting for child mortality (Roser, 2019): Improved living conditions suggest that what was considered later adulthood in the 19th and early 20th century (e.g., age 60) may be closer to what is considered late middle-age today. The notion of wisdom in the folk adage is also not necessarily representative of the scientific consensus reviewed above: Typical folk conceptions and archetypes often conflate wisdom with life experience (Gordon & Jordan, 2017). Moreover, though lay people generally expect the attainment of wisdom to be associated with old age (e.g., Clayton & Birren, 1980; Knight & Parr, 1999), these expectations have been found to be age-dependent. For instance, older individuals are more pessimistic about the potential for age and age-related experiences to bring about wisdom (e.g., Clayton & Birren, 1980; Holliday & Chandler, 1986). Individuals are also more likely to rate targets from their own age groups as wise (Denney, Dew, & Kroupa, 1995; Knight & Parr, 1999).

The notion that wisdom increases in older age is only one of several possible theoretical positions. As others have pointed out (e.g., Sternberg, 2005) one may also assume that wisdom declines in older age if it follows the same route as domain-general cognitive abilities. Given that declines in domain-general cognitive abilities begin in young adulthood and become particularly pronounced in the sixth and seventh decade of life (Salthouse, 2009), one could then speculate that wisdom is greatest in middle adulthood (Labouvie-Vief, 2003; Webster, Westerhof, & Bohlmeijer, 2014), assuming a modest degree of cognitive decline with an accumulation of a wide variety of life experiences. Finally, wisdom may also be lowest among the middle-aged adults, who are typically exposed to a larger number of mental stressors than younger and older adults, including both taking care of the emerging adults that still live in one's home as well as one's frail parents (Boyczuk & Fletcher, 2016). Such mental stressors may in turn inhibit one's ability to engage in central aspects of wisdom reviewed earlier.

Empirical research on the core components of wisdom—understood here as uniting moral aspirations and PMC—has also called into question the proverbial association between wisdom and age. Relevant evidence appears inconclusive. Some studies have reported close-to-zero correlations between wisdom and age across the lifespan (e.g., Cheraghi, Kadivar, Ardelt, Asgari, & Farzad, 2015; Grossmann & Kross, 2014; Grossmann, Oakes, & Santos, 2019; Levenson et al., 2005), whereas others have reported small-to-moderate negative correlations (e.g., Monika Ardelt & Jeste, 2016; Bang & Montgomery, 2013; Glück et al., 2013; Mansfield, McLean, & Lilgendahl, 2010), while still other studies have reported moderate-to-large correlations (e.g., Grossmann et al., 2010; Kunzmann & Baltes, 2003).

A forthcoming meta-analysis found the correlation between expert conceptualizations of wisdom and age to be small but still significantly greater than zero (Dong,

Weststrate, & Fournier, in preparation). Although the size of the correlation was found to vary as a function of which wisdom measure was used, the effect sizes did not vary systematically as a function of the approach to measurement (e.g., self-report vs. performance measures). Some evidence further suggests that the association between wisdom and age might be curvilinear, though the patterns of relationship appear inconclusive. Some cross-sectional research found a U-shaped distribution, with both younger and older adults reporting superior PMC performance in comparison to middle-aged adults (Brienza et al., 2018). Other work using trait-style questionnaires found inversed U-shaped distribution of common wisdom model characteristics across ages (e.g., Ardelt, Pridgen, & Nutter-Pridgen, 2018; Thomas et al., 2017).

Notably, virtually all studies on the topic of wisdom and aging so far have been cross-sectional, thus conflating cultural, socioeconomic and other cohort-specific effects with the evidence of particular shifts in wisdom across adulthood. As a consequence, inconsistencies in findings are expected. Comprehensive longitudinal studies following best practices for measurement of moral aspirations and PMC are necessary to systematically evaluate the development of wisdom across the lifespan.

### Development Through Teaching and Training

In many countries around the world (e.g., Bhutan, Malaysia, but also the USA and Canada), one of the chief goals of education involves developing moral sensitivity and critical thinking—integral to the moral and metacognitive core components of wisdom. Claims about wisdom development through teaching can be found in various historical texts (Ferrari & Kim, 2019; Plato, 2012; Whitehead, 1929), but they often reflect a different understanding of wisdom, aimed at different psychological processes than those central to the science of wisdom today (see Figure 1).

For instance, Ancient Greek Sophists aimed to develop rhetoric skills and rationality, whereas the Socratic approach aimed to develop meta-cognitive habits allowing one to examine experiences, values and knowledge, often through a dialog that encouraged and modeled self-transcendence (Edmondson & Woerner, 2019). In what follows we will chiefly focus on the question of teaching and trainability of the characteristics in the common wisdom model discussed above—moral aspirations and PMC.

In the survey of wisdom researchers, we included a question about scientists' views on whether and how wisdom may develop. Specifically, we asked "Can a person develop these qualities? If so, how?" Almost all scientists viewed wisdom as malleable (96%). Moreover, as Figure 5 indicates, most scholars attributed wisdom development to both direct and indirect learning. Scientists considered the main sources of such indirect learning to be through life experiences, but also through direct targeted interventions promoting mindfulness, training and deliberate practice (e.g., in critical thinking or dialogical thinking), which can extend to therapeutic contexts (Hanna & Ottens, 1995; Lieberei & Linden, 2011).

More specifically, modern approaches to formal wisdom education in K-12 settings often seek to foster PMC by expanding
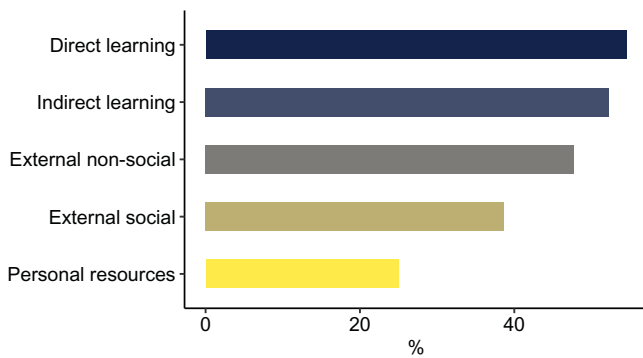
Figure 5. Scientists' views on the development of wisdom, as evident in content-analyses of written responses to the question "Can person develop these qualities? If so, how?" External non-social resources included learning from life experiences, education, mindfulness and spiritual practice and targeted interventions. External social resources included social learning and behavioral observations of wisdom exemplars and seeking advice from others and mentors. Personal resources referred to personal characteristics (e.g., openness to experience, patience), as well as inborn, innate or nature-given capacities.

on existing programs in character education and Social Emotional Learning (e.g., ProjectWisdom.com) or positive education (Parks & Schueller, 2014), sometimes cast as transformative education that requires "living schools" (O'Brien & Howard, 2016). These programs already emphasize moral aspirations, and wisdom education usually aims to increase students' sensitivity or depth of self-understanding in an effort to improve the clarity and sensitive application of these aspirations.

However, though theorizing on teaching for wisdom is abundant (e.g., Maxwell, 2019; Sternberg, 2001, see Ferrari & Potworowski, 2009, for review), the effectiveness of teaching-based interventions for growth in moral aspirations or PMC has not been confirmed empirically. It is noteworthy that none of the approaches have been subjected to rigorous randomized-control trial tests of effectiveness for students' moral aspirations or PMC, and only a few (e.g., Project Wisdom or P4C) have been given *any* empirical assessments, suggesting some improvement of students' critical thinking and sense of community (e.g., Naji & Hashim, 2017).

A notable exception is a recent attempt to examine the effects of different curricula in introductory philosophy courses in college for growth in student-reported characteristics depicted in the common wisdom model (see Figure 3) on a trait-style questionnaire (Bruya & Ardelt, 2018). Training curricula involved either a self-cultivation journal focusing on students' character strengths, or a self-reflection journal focusing on understanding values and beliefs of exemplars presented in the taught texts for students' personal lives. Compared to students taught with a standard university philosophy class lacking in self-reflective components, students in the self-reflection journal group (but not self-cultivation journal group) reported growth in aspects of the common wisdom model. Though this work requires replication on larger samples, it provides some initial empirical evidence for the effectiveness of wisdom education.

Training the Components of Wisdom

Basic empirical research on the *trainability* of moral aspirations and PMC are relatively more prevalent. Such training can involve diary journaling, mindfulness training, or meditation training (Pascual-Leone, 2000). However, evidence about the trainability of central wisdom characteristics in much of this work appears inconclusive.

For example, theoretical work on mindfulness often implies shifts in PMC (e.g., Bernstein et al., 2015). However, most of the mindfulness training studies either examine downstream effects for mental health and well-being (Khoury et al., 2013; Zoogman, Goldberg, Hoyt, & Miller, 2015), without testing relevant meta-cognitive processes, or they focus on aspects of meta-cognition that are distinct from the psychological wisdom construct (e.g., executive functioning; Tang, Yang, Leve, & Harold, 2012). Initial empirical work targeting effects of mindfulness training on PMC directly has yielded mixed results. One study that employed mindfulness training (in combination with didactic teaching about wisdom exemplars) over the course of an 18-week college leadership course observed no significant pre-post change in PMC-related characteristics (Sharma & Dewangan, 2017). Other work suggests positive effects of mindfulness-based training on PMC-related characteristics (Bieling et al., 2012; Boulware, Huskey, Mangelsdorf, & Nusbaum, 2019; Fissler et al., 2016), whereas yet other work suggests that inducing mindfulness (vs. inducing mind-wandering) can heighten PMC components such as cognitive empathy, but only among individuals low in conscientiousness and extraversion (Winning & Boag, 2015). Kabat-Zinn (2017), a leading advocate of mindfulness based interventions claims it is too early to tell the extent of their clinical effectiveness.

More directly relevant to developing wisdom, recent intervention attempts aimed to clarify the role of the core component of mindfulness training called decentering (Bernstein et al., 2015) or self-distancing (Kross & Ayduk, 2017). Self-distancing aims to shift attention from a habitual insider perspective on one's subjective experience to an outsider view onto the same experience and has been recently effectively instated through illeist, third-person writing exercises (Grossmann & Kross, 2014; Grossmann et al., 2019; Kross et al., 2014; Orvell, Ayduk, Moser, Gelman, & Kross, 2019, for a review). A recent set of high-powered ($N = 555$) longitudinal interventions (Grossmann et al., 2020) tested the utility of illeist writing exercises during diary-reflection for the trainability of central wisdom-related characteristics in everyday life: intellectual humility, open-mindedness about how situations could unfold, consideration of alternate viewpoints and attempts to integrate diverse viewpoints. In a month-long experiment, adopting an illeist vs. first-person perspective when writing about most significant daily experiences resulted in substantial growth in the expression of PMC when content-analyzing writing samples about social challenges people reported after vs. before the intervention. A follow-up study replicated the illeist reflection effect on wise reasoning (vs. first-person- and no-pronoun-controls) in a weeklong intervention, again showing differences in the magnitude of PMC growth in participants' writing samples about social challenges. Overall, evidence so far suggests that training wisdom via mindfulness and journalist techniques is possible (also see

Ardelt, 2020), calling for further evidence-based work on wisdom training across a range of social settings.

Section 5. Do Various Cultural Groups Display Different Patterns of Performance on Wisdom Tests, and If So What Might Explain Those Differences?

The review of dispositional, situational, and experiential factors for wisdom (Section 3) as well as its development (Section 4) are intimately linked with the consideration of the larger cultural context people are socialized in. Therefore, in Section 5 we broaden our focus to the role of cultural contexts for wisdom. We start off by reviewing the differences in the folk concept of wisdom, and how the common wisdom model helps to overcome the conceptual challenges of divergence in meaning of the folk concept. Focusing of the aspects of the common wisdom model, we subsequently review the broad national differences in wisdom and provide a theoretical analysis of factors that may contribute to these differences in wisdom-related performance on tasks measuring aspects of the common wisdom model. Next, we will review subcultural differences, using social class and gender as examples.

Folk Concept of Wisdom

Though terms translatable as "wisdom" are present in many societies, their folk meaning can take different forms across cultures (Ferrari & Alhosseini, 2019). Culture-bound exemplars of wisdom may emphasize different moral virtues (e.g., fairness vs. loyalty; Miller et al., 1990), may attribute wisdom to different styles of leadership (e.g., paternalistic leader vs. a participative leader; House, Hanges, Javidan, Dorfman, & Gupta, 2004), or may vary in their emphasis on abstract knowledge vs. socio-emotional experiences (Takahashi & Bordia, 2000). The folk concept of wisdom is nuanced (Grossmann & Kung, 2018) and is subject to cultural change (Varnum & Grossmann, 2017).

The common wisdom model outlined above helps to overcome the culture-bound conceptual challenges by zeroing in on the central components across empirical definitions of wisdom in different labs around the world: moral aspirations and PMC. Notably, theoretical analysis suggests that PMC is central to the conceptualization of wisdom across several cultural traditions (Oakes, Brienza, Elnakouri, & Grossmann, 2019). Similarly, moral aspirations is one of the key features of wisdom exemplars both in the Eastern and Western conceptualizations (Walsh, 2014; Weststrate, Ferrari, & Ardelt, 2016; Zagzebski, 2017). Moreover, focus on integration of moral aspirations and PMC is central to several indigenous perspectives on wisdom in Asia (Wang & Zheng, 2014) and the Middle East (Kord-Noghabi, Karami, Beiranvand, & Nazari, 2018). To avoid conceptual confusion, in what follows we review emerging evidence on cultural differences in performance on common aspects of wisdom and discuss possible ways to explain these differences.

National Comparisons

Cross-cultural studies on meta-cognitive performance on tasks reflecting the common wisdom model are sparse and typically involve direct cross-national comparisons (acknowledging substantial variability within each respective culture). Existing evidence paints a consistent picture of modest differences between Japanese and US samples. The differences appear more pronounced among younger adults than older adults, and when using observer-ratings as compared to self-reports of states (see Table 1). In one of the first cross-cultural performance studies, age- and social-class-heterogeneous samples of Americans from the Midwest and Japanese from the Tokyo Metropolitan area (Grossmann et al., 2012) read newspaper articles describing a series of social conflicts (Grossmann et al., 2010). Participants reflected aloud on the future development of the issues described in the article, with their written responses content-analyzed by independent coders for PMC and moral aspirational aspects of wisdom. Results indicated that younger and middle-aged Japanese showed greater wisdom in their narratives than their American counterparts. These results were attenuated for older adults, in part due to older cohorts of Americans showing greater wisdom than younger cohorts, but no such cohort effects in Japan. Similar cross-cultural differences, albeit of a weaker magnitude, appear when comparing American (Brienza et al., 2018) and Chinese (Hu, Grossman, Sharpinskyi, Ferrari, & Zhang, 2019) performance on the SWiS scale (see Table 1), with the strongest cultural difference on the intellectual humility components of the PMC.

What can account for the national differences between East Asian and American samples? Some cultural groups such as Chinese or Japanese tend to focus more on the social context than do some other cultural groups, such as European Americans, who tend to focus on the individual when reflecting on similar experiences (Cohen, Hoshino-Browne, & Leung, 2007). Greater focus on the social context may help persons in East Asian countries achieve the overarching goals of relatedness and social connection (e.g., the concept of ren [humaneness/benevolence] in the Confucian tradition; Confucius, 2000, v. XII.22), which are more important among these cultural groups (Friedman, Chi, & Liu, 2006; Holloway, 1988; Ohbuchi & Atsumi, 2010; Triandis, 1989). Evidence exist that such importance is transmitted early on, with elementary school textbooks in Japan emphasizing the value of interpersonal considerations more than textbooks in the US (Imada, 2012). Consistent with these social orientation differences, East Asians favor less direct ways to resolve social conflict (e.g., avoidance strategies, third-party mediation) than Americans, who in turn favor more direct conflict resolution strategies (Leung, 1988; Morris et al., 1998; Ohbuchi & Takahashi, 1994). Such indirect ways to manage social conflicts may require greater attunement and integration of non-verbal, contextual cues, benefitting from heightened PMC to this end. Cultural differences in preferred conflict resolution strategies, together with differences in the culturally-prescribed and transmitted values of social connection and relational interdependence (Markus & Kitayama, 1991), may explain the observed

differences in PMC and moral aspirations oriented toward benevolence and prosociality.

Sub-Cultural Class Differences

Researchers have also began to examine the role of sub-cultural factors such as social class for the common wisdom model. Within the US, higher individual social class was associated with significantly lower performance on PMC, even when controlling for age, social desirability, and emotional intelligence (Brienza & Grossmann, 2017). Notably, this effect was localized to reflections on interpersonal conflicts and absent for reflections on societal conflicts. This sub-cultural difference in wisdom about interpersonal conflicts can be explained in terms of ecological affordances in different class environments, suggesting that they reflect an ecological adaptation of lower class individuals to their resource-poor ecology (Frankenhuis, Panchanathan, & Nettle, 2016; Pepper & Nettle, 2017). Successful navigation of resource-poor environment benefits from interdependence and greater social vigilance, especially in domains relevant to well-being. Therefore, one may expect class-related PMC differences in reflections on interpersonal affairs, but not in reflections on political affairs in a far removed country. In support of this theoretical argument, prior research has indicated that lower class individuals are more interdependent (Grossmann & Varnum, 2011; Stephens, Fryberg, & Markus, 2011; Stephens, Markus, & Phillips, 2014) and more sensitive to social cues than higher class individuals (Dietze & Knowles, 2016; Grossmann & Varnum, 2011; Kraus, Piff, & Keltner, 2011). It should be noted at this point that the sub-cultural differences observed so far are small, subject to cultural change, and require further testing to determine the conditions promoting adaptation to different class ecologies.

Sub-Cultural Gender Differences

Folk beliefs about gender suggest that women are more likely to be empathetic or consider others' viewpoint than men. In many contemporary societies, women also tend to have less public power than men and therefore less social visibility, raising the question about gender differences in wisdom. Relevant empirical evidence is mixed and mostly inconclusive. Some evidence suggests that on some performance and self-report measures of PMC women tend to score somewhat higher than men, though this effect is much weaker than larger cultural or social class differences and depends on the measure (Kitayama , Karasawa, Grossmann, Na, Varnum, & Nisbett, 2019). Some evidence further suggests that gender effects depend on the social situation: In situations in which men tend to have a work-related conflict with a female coworker, they tend to reason more wisely than in situations in which the conflict is with the coworker of the same gender; this effect is less pronounced for women (Brienza et al., 2018). Finally, meta-analytic estimates suggest that gender does not impact the relationship of wisdom and other individual differences or well-being (Dong et al., in preparation). Further empirical evidence is needed to unpack the role of gender for wisdom in different situational and cultural contexts, and to investigate the role of nontraditional genders.

Together, emerging evidence suggests evidence of cross-cultural and sub-cultural differences in performance on wisdom-related tests. This difference appears to reflect adaptations to specific cultural norms, socialization and conflict resolution practices, and demands of local ecology, calling for a culturally grounded understanding of wisdom-related performance.

Section 6. What Significant Scientific Issues Are Presently Unresolved?

Despite the emerging consensus among empirically oriented wisdom scientists that central to wisdom is morally-grounded PMC, numerous critical issues within the wisdom science community and related disciplines remain unresolved. Therefore, in this final section, we reflect on the wisdom-related research to date and pose critical questions about conceptual ambiguity of character strengths, humility, and open-mindedness constructs vis-à-vis wisdom. We start by discussing the similarities and differences between the broad range of constructs within the theme of character strengths and how they may relate to the aspects of the common wisdom model. Next, we turn to the constructs of intellectual humility and open-mindedness and discuss overlap with the common wisdom model. Beyond concrete individual differences, we also consider how the empirical construct of wisdom can benefit the broad discussion on (meta-) consciousness and artificial intelligence. Subsequently, we consider several methodological and theoretical challenges for future wisdom research, including the domain-specificity of the aspects of the common wisdom model, psychological mechanisms affording the expression of PMC and moral aspirations, and methodological jingle-jangle challenges in the naming of PMC and moral aspects of the construct. We conclude by discussing the role of emotions and emotion regulation, and discuss several challenges educators and counseling practitioners may face when aiming to teach wisdom.

Character Strengths as Wisdom in Disguise?

The last several decades have not only seen the emergence of the psychometric base to the wisdom construct, but also a proliferation of potentially related constructs. Psychological scientists so far have not considered the conceptual and psychometric relationship of such constructs to wisdom. Below we provide two examples. This list is not exhaustive and questions below may be applied broadly.

Intellectual Humility

Several constructs have recently emerged under the umbrella rubric of character strengths and virtues (e.g., Bleidorn & Denissen, 2015; Fleeson, Furr, Jayawickreme, Meindl, & Helzer, 2014; Peterson & Seligman, 2004), which include a range of characteristics such as courage, gratitude (e.g.,

DeSteno, Li, Dickens, & Lerner, 2014; McCullough, Kilpatrick, Emmons, & Larson, 2001), compassion (Goetz, Keltner, & Simon-Thomas, 2010) and forgiveness (McCullough, 2000). Some of these constructs have their roots in the virtue theory and Christian theology, and have become popular within the positive psychology movement (Seligman & Csikszentmihalyi, 2014). One character strength that has received a great deal of attention concerns (intellectual) humility (e.g., Leary et al., 2017; Stellar et al., 2018; Van Tongeren, Davis, Hook, & Witvliet, 2019), defined as the "ability to accurately acknowledge one's limitations and abilities and (b) an interpersonal stance that is other-oriented rather than self-focused" (Van Tongeren et al., 2019). Intellectual humility was the focus of Socrates' definition of wisdom and the overlap of this conceptual definition with the common wisdom model is striking, raising the question about the distinctiveness of humility from wisdom, and the discriminant validity of the extant measures. Indeed, several of the most common measures aiming to capture the common wisdom model (Table 1) include intellectual humility as a central facet. Moreover, features of humility and wisdom are listed among the 28 measurable character strengths (Peterson & Seligman, 2004). Undoubtedly, intellectual humility is an important concept in a time of ever increasing political polarization (Haidt & Lukianoff, 2018; Leary et al., 2017). The question that remains open concerns its uniqueness beyond the PMC components it shares with the common wisdom model advanced in the present target article. If it is just a facet of the same broader construct, researchers studying humility and wisdom may benefit from insights from respective fields, including concerns with measurement levels and usability of the self-report scales (see Section 3). After all, most humility instruments so far appear to involve abstract self-ratings, even though the process they arguably aim to capture concern is meta-cognitive and thereby is not easily amendable to abstract self-beliefs (Brienza et al., 2018; Grossmann, Dorfman, et al., 2020). Abstract self-beliefs may be self-deceiving or used for purposes of impression management (Dunning, Heath, & Suls, 2004; Kihlstrom, Eich, Sandbrand, & Tobias, 2000; T. D. Wilson & Bar-Anan, 2008), raising questions whether a person claiming that they are "much more humble than you would understand" accurately expresses their humility.

Open-Mindedness

A related characteristic that has experienced a resurgence in scientific interest concerns open-mindedness. The construct itself is not new and can be traced to theories by Carl Rogers and others (e.g., Rogers, 1954). Indeed, the initial intent of the openness factor of the OCEAN model of personality has included open-mindedness (for review, John, Naumann, & Soto, 2008, esp. Table 4.2). However, whereas openness/open-mindedness in personality research has been conceptually defined as a description of "the breadth, depth, originality, and complexity of an individual's mental and experiential life" (John et al., 2008), there appears to be no unified definition of open-mindedness neither as a character strength nor as a thinking disposition. Some scholars define

and proceed to measure it as intellectual flexibility and openness to diverse viewpoints in the process of making a decision (Fujita, Gollwitzer, & Oettingen, 2007; Price, Ottati, Wilson, & Kim, 2015). Others define it almost identically to the definition of humility above, as "an intellectual quality displayed by someone who recognizes that her belief could be wrong, so her mind is subject to change" (Spiegel, 2012). And yet others define open-minded thinking as "the disposition to weigh new evidence against a favored belief heavily (or lightly), the disposition to spend a great deal of time (or very little) on a problem before giving up, or the disposition to weigh heavily the opinions of others in forming one's own" (Baron, 1985, p. 15; also see Stanovich & West, 1997). The conceptual confusion concerning open-mindedness is particularly evident in the puzzling observations that open-minded thinking appears to be *positively* related to *political polarization* about climate change (Kahan & Corbin, 2016): If the definition of open-mindedness involves openness to diverse viewpoints and a potential of one being wrong, one ought to expect *less* polarization among more open-minded individuals! Similar to the concept of humility, this conceptual confusion raises questions about the meaning of the term, as well as the overlap with the definition of wisdom as a morally-grounded PMC. Researchers on open-mindedness may benefit from the present discussion of the common wisdom model, which may provide a roadmap for conceptual and methodological clarification of the open-mindedness construct, as well.

Overall, bodies of research on character strength and thinking dispositions have not sufficiently clarified the relationship to psychological characteristics of wisdom. Is wisdom one of many virtues linked to creativity, open-mindedness, perspective, and innovation, and distinct from humility, prudence, or justice (Peterson & Seligman, 2004)? Both the common wisdom model advanced here and the relevant psychometric evidence are inconsistent with this perspective: The common wisdom model involves psychological characteristics of humility, prudence, as well as moral aspirations concerning justice and fairness. An alternative possibility advanced in Aristotelian and Thomistic virtue ethics is that wisdom (or prudence) represents a cardinal meta-virtue allowing one to discern which actions to pursue in concrete circumstances one may be experiencing (e.g., Darnell et al., 2019; Schwartz & Sharpe, 2006). In relationship to thinking dispositions or character strengths, wisdom may be represented as a tool allowing one to figure out which of the character traits are more relevant in a given situation. This perspective is consistent with the common wisdom framework advanced here, with perspectival meta-cognition oriented toward discerning the fit between one's dispositions, one's goals, and the features of a given situation. However, this "cardinal virtue" perspective requires measurement of the fit between one's tendencies and the situational demands across multiple diagnostic situations, to estimate whether PMC indeed allows one to flexibly switch between different behaviors to optimally fit the context of a new situation. No psychometric instruments for the assessment of character strengths (e.g., Fleeson, Furr,

Jayawickreme, Meindl, & Helzer, 2014), thinking dispositions (e.g., Baron, 2019; Perkins, Jay, & Tishman, 1993; Stanovich & West, 2002) or wisdom (Staudinger & Glück, 2011) have so far even attempted to assess relevant characteristics within such "strategy-situation fit" framework.

Toward a Psychological and Cognitive Science of Wisdom

Beyond individual differences in character strengths and thinking dispositions, the common wisdom model as morally-grounded PMC also has implications for research on consciousness and artificial intelligence. We review possible connections and a range of unanswered questions below.

Consciousness

Within the body of research on consciousness, some researchers have suggested three different levels of awareness (e.g., Pinard, 1992; Schooler, 2002), including unconscious processes, basic conscious processes, and meta-conscious processes. At the implicit or enacted level of consciousness, experience is embedded in the actions one is experiencing. At the explicit level of consciousness, the person engages in conscious processing of the phenomena. At the third, meta-conscious level, the person deliberately and consciously takes charge of their cognitive functioning (Damasio, 1999; Pinard, 1992; Proust, 2013; Winkielman & Schooler, 2011)—i.e., one becomes aware of the content of one's conscious processes in ways that become increasingly transparent. The concept of meta-consciousness shares a great deal in common with the meta-cognitive components central to the empirical conceptualizations of wisdom (see Figure 1). Both require a perspectival appreciation of one's conscious experience (e.g., experience of the inadequacy of one's explanations of a given concept). Moreover, theoretical and empirical work on meta-consciousness suggests that the processes triggering meta-consciousness (Winkielman & Schooler, 2011) may be relevant for boosting wisdom as well. At the same time, the lack of moral grounding for the concept of meta-consciousness, compared to its centrality to the common wisdom model, raises the questions about the limits of the conceptual overlap. Is meta-consciousness a necessary, but not sufficient aspect of wisdom? If meta-consciousness is necessary for wisdom, can wisdom ever become habitual or automatic? Are the individuals prone to mind-wandering more or less likely to think wisely? Answers to these questions can help better understand the concept of wisdom from a cognitive science perspective, including the role of implicit, automatic, and physiological processes.

Artificial Intelligence

Artificial intelligence (AI) research typically aims to develop "rational," intelligent agents, a quality attributed to devices that adaptively react to the environment and take actions that maximize their chances of successfully achieving their goals (Russell & Norvig, 2016). Notably, AI is often attributed to those qualities that machine devices have not yet mastered—an observation often described as the Tesler's Theorem (Hofstadter, 1980, p. 601) or the AI effect (McCorduck, 2004). Given the steady AI advances in the domains of speech comprehension, language translations, and human-superior performance on strategic games such as chess or Go, a question arises: Will AI at some point be able to acquire wisdom? The development of "wise" AI systems is of special relevance in the time of ethical debates concerning the use of AI and machine-learning approaches to human-machine interactions, autonomous cars, political advertising, and criminal court decisions. For some time, AI researchers have recognized the hierarchy of Data, Information, Knowledge, and Wisdom (DIKW), in which data represent measurements or symbols, information is the application of data to answer questions, knowledge depends on the context of question and answer, and wisdom depends on values. Indeed, there is a growing recognition that values need to be incorporated into the development of AI (Conn, 2017). On the surface, advances in AI-based knowledge representation, expert systems, and planning suggest that some aspects of human wisdom may be approximated via the AI. At the same time, the ideal of a goal-oriented, rational agent central to the AI research (Russell & Norvig, 2016) can be idiosyncratic to the common characteristics of a wise person: Under many circumstances, a wise person may choose a socially conscious, *reasonable* option, rather than preference-maximizing *rational* option (Rawls, 1971; Toulmin, 2001). This characterization of a wise person is not idiosyncratic, as it is shared among laypeople across a range of contemporary societies (Grossmann, Eibach, et al., 2020). Whether AI researchers can go beyond the maxim of goal-oriented optimization and to simulate psychological characteristics of wisdom in the context of ill-defined problems remains an open question. How will AI be able to integrate the influx of multi-model streams of information with moral aspirations as suggested by Asimov's zeroth law or robotics (1986)? Without doubt, "wise" AI requires discerning where, when, and to what degree to apply different rules for processing information, but it also requires optimization toward resolution of certain tradeoffs (e.g., tradeoffs between general and context-specific strategies). Perhaps a first step in testing the viability of a "wise" AI will be contingent on the development of systems capable to effectively simulate PMC common to psychological wisdom in the context of complex, social issues.

Domains and Psychological Mechanisms Underlying the Common Wisdom Model

We began by proposing a common wisdom model to advance psychological research on wisdom, zeroing in on the most frequently assessed characteristics of wisdom in empirical sciences. We further outlined several arguments why these characteristics may be central to contemporary wisdom research. The common wisdom model allows us to bring the diverse research from the emerging wisdom science under one single common denominator. Despite this pragmatic benefit, several aspects of the model require further empirical and conceptual scholarship. First, we have not yet made clear if moral grounding sets the value

commitments by which PMC evaluates proposed outcomes, nor have we specified much of a process model for this. Second, we have not specified a domain of applicability of the model. So far, most of the empirical research we drew on concerned peoples' personal choices (e.g., Baltes & Smith, 2008; Grossmann, Gerlach, et al., 2016), juxtaposing them with advice-like situations (Grossmann & Kross, 2014; Staudinger & Baltes, 1996). Future work is needed to systematically explore the applicability of the model across domains of personal and vicarious experiences, mentorship and advice-giving, as well as the domain of institutional policies. Finally, the exact role of wisdom-enhancing decentering (Bernstein et al., 2015) and self-distancing strategies (Kross & Ayduk, 2017) for the PMC components of the common wisdom model remain underspecified. Evidence so far suggests that the effect of ego-decentering does appear to occur because of the reduced affective arousal (Grossmann et al., 2019), raising the question about possible cognitive and motivational mechanisms.

Outstanding Jingle-Jangle Fallacies in Wisdom Research

Because of the long intellectual tradition of wisdom scholarship in philosophy, the psychological literature on wisdom faces a number of jingle and jangle problems (Pedhazur & Schmelkin, 2013)—that is, researchers use the same labels to refer to different phenomena (jingle fallacy) as well as different labels to describe the same underlying phenomenon (jangle fallacy). The existence of jingle-jangle fallacies makes sense when one considers that wisdom researchers are largely interdisciplinary, and an organized community of research has only recently coalesced. Left in silos for decades long, researchers have adopted idiosyncratic language. Though the common wisdom model helps to address the higher-level psychological characteristics empirical wisdom researchers tend to study, at a lower level a range of ambiguities still remain. Below, we provide several examples of such ambiguities.

Jingle (same label, different meaning): A range of conceptualizations of wisdom emphasize "reflection" (e.g., Ardelt, 2003; Webster, 2003), but refer to different psychological processes. Some conceptualizations (e.g., Ardelt, 2003) define "reflection" as encompassing perspective-taking and the absence of subjectivity and projections. Others (e.g., Webster, 2003) focus on behavioral reflection on events with the goal of deriving insight from them. Another example concerns the use of "perspective-taking" to describe some of the wisdom-related characteristics. Perspective-taking can mean many things, including an objective perspective on one's own issues (Kross & Ayduk, 2017; Libby, Shaeffer, Eibach, & Slemmer, 2007), an attempt to consider others' interests, or even accuracy in understanding other people's thought and intentions (cf. theory-of-mind; Wellman, 1990). Given recent observations concerning lack of empirical convergence across various measures of perspective-taking and theory of mind (Warnell & Redcay, 2019), specificity in characterization of perspective-taking within the common wisdom model appears paramount.

Jangle (different label, same meaning): Surveying the recent Handbook of Wisdom (Sternberg & Glück, 2019), many conceptualizations include labels such as *concern for others*, *common good orientation*, *compassion*, *positive caring emotions*, *empathy*, *motivation to nurture well-being of others*. Despite apparent similarity in the content of the theme, no attempt has been made yet to identify the degree of overlap between these labels, raising the question whether they reflect the same construct. Returning to the perspective-taking example, some scholars use the labels *(cognitive) empathy, rational compassion,* or *openness to diverse viewpoints* instead of perspective-taking, without delineating the extent to which these processes overlap. Future work may benefit from building on the common wisdom model, with an eye toward a uniform terminology, complemented by rigorous psychometric analyses to avoid proliferation of jingle and jangle fallacies in empirical wisdom science and related fields.

The Role of Emotions for Wisdom

Some folk beliefs suggest that wisdom requires adaptive emotion regulation. Prior to differentiating wisdom from emotion regulation, it is worth pointing out that the role of emotion regulation/equanimity for wisdom is not well understood: Some scholars believe emotion regulatory processes to be important for wisdom (Ardelt & Ferrari, 2014; Bangen, Meeks, & Jeste, 2013), yet working definitions of wisdom rarely include emotion- and self-regulatory characteristics (see Figure 1). Part of the confusion may stem from theorizing that emotion regulation/equanimity is a constitutive element (Webster, 2007) rather than a developmental precursor (Glück, 2020). The former position finds little empirical support, with recent evidence suggesting that prevalence of the central components of wisdom does not necessarily require downregulated negative affect (Grossmann et al., 2019). Indeed, emotions can both be a source of information (Barrett & Campos, 1987; Kashdan, Barrett, & McKnight, 2015; Kunzmann & Glück, 2018) and can also lead to biases in judgments and decision-making (Lerner, Li, Valdesolo, & Kassam, 2015). In a similar vein, it remains unclear whether emotion regulation serves as a developmental precursor to wisdom. On the one hand, by reflecting on challenging life experiences and learning from them, it is possible that emotion regulation *facilitates* acquisition of the central characteristics of wisdom, allowing the person to explore their own (negative) emotions openly and non-defensively (Glück & Bluck, 2013; Glück, Bluck, et al., 2019; Weststrate & Glück, 2017). On the other hand, adaptive emotion regulation does not guarantee that one will engage in the self-reflection that may be critical for developing the wisdom-related characteristics discussed above. In fact, the most adaptive forms of emotion regulation might entail efforts to maintain previous levels of positive affect in the wake of adversity by shutting down self-reflective processes that could jeopardize happiness, but otherwise promote growth (Staudinger & Kunzmann, 2005). Given these considerations, the Toronto Wisdom Task Force concluded that

emotion regulation is not sufficient for wisdom, although in many cases good emotion regulation skills may be necessary to develop wisdom.

The confusion about the role of emotion regulation for wisdom may stem from the confusion about the concept of emotion regulation itself (Gross, 2015; Lazarus & Folkman, 1984). Are researchers referring to the process of experiencing emotions in a particular way, coping with emotional experiences, or even selection or avoidance of specific events that may lead to emotional outcomes or their absence? Without paying greater attention to the specific temporal point in the regulatory process, it may be challenging to find a common ground when discussing the role of emotional processes. Additionally, a popular tendency to equate adaptive emotion regulation with the cognitive reappraisal strategy (e.g., Gross & John, 2003; McRae, Ciesielski, & Gross, 2012) raises the question about the conceptual overlap of emotion regulation with the central characteristics in the common wisdom model. Cognitive reappraisal is defined as a strategy that aims to change the affective impact of a stimulus by changing the way one thinks about the stimulus (Gross, 2015; Gross & Thompson, 2007). To achieve this goal, cognitive reappraisal deploys meta-cognitive processes central to the psychological wisdom construct such as decentering. As a consequence, the prevalence of higher cognitive reappraisal tendencies among individuals reporting greater PMC (e.g., Grossmann et al., 2016) may be a trivial matter of conceptual confusion rather than an empirical finding in its own right. At the same time, the possible conceptual overlap of cognitive reappraisal and the PMC aspects of wisdom suggest that it may be possible to build on the existing neurophysiological insights about cognitive reappraisal for understanding the physiological underpinnings of wisdom (Meeks & Jeste, 2009). For instance, meta-analytic evidence suggests that cognitive reappraisal involves cognitive control regions and the lateral temporal cortex, but not the vmPFC, and that it attenuates activity in the amygdala but not the other brain regions (Buhle et al., 2014).

Though questions about the role of emotions for wisdom often take the form of up- versus down-regulation of affect, in challenging social situations people typically report experiencing a wide range of emotions (Fitness & Warburton, 2009). From a functionalist perspective (Barrett & Campos, 1987; Keltner & Gross, 1999) richer emotional experience provides more nuanced information about the situation at hand. Notably, recognition of emotional richness in the experience (Grossmann & Ellsworth, 2017; Grossmann, Huynh, & Ellsworth, 2016; Quoidbach et al., 2014) likely depends on the meta-cognitive integration of affective, physiological, social, and cognitive information streams. Relatively little wisdom research has examined how richness in representation of one's emotions relates to the common wisdom model, with existing research supporting this proposed link between emotional richness and expression of wisdom-related PMC in reflections on interpersonal and political conflicts (Grossmann et al., 2019). This research highlights the utility of going beyond mere categorization of emotional experiences in terms of their valence or arousal and consideration of emotional granularity or complexity (Barrett; Grossmann et al., 2016).

Unanswered Questions About Teaching for Wisdom

As reviewed in prior sections, many educational initiatives claim to promote wisdom in schools—and some alternative schools specifically claim to cultivate wisdom (e.g., Waldorf schools; Living Wisdom schools). However, such claims are mostly speculative and based on prevalent cultural-historical ideas about wisdom, without the evidence necessary for effective curricula development (e.g., randomized control trials). The centrality of morally-grounded meta-cognition for empirical concept of wisdom suggests that educators can benefit from building on strategies and techniques fostering development of PMC in the context of character education that aims to refine students' moral aspirations. Such an undertaking can be challenged by limited evidence of the effectiveness of much character education (Berkowitz & Bier, 2004) and limited transfer effects (Barnett & Ceci, 2002) from intervention programs aiming to improve cognition (Melby-Lervåg, Redick, & Hulme, 2016): Even though students may learn how to apply certain cognitive strategies in domains close to teaching examples, there is little evidence for the subsequent transfer of skills to the new domains that students may encounter in their lives. One possibility for fostering "far transfer" more effectively is by providing a wider range of examples from the students' lived experiences, thereby allowing for effective shifts in meta-cognitive dispositions (e.g., Grossmann et al., 2020; Mascolo & Fischer, 2015).

Other unanswered questions about wisdom-focused education concern the aspects of meta-cognition most suitable for educational interventions and the role of socio-cultural considerations when developing wisdom-oriented curricula. Is meta-awareness easier to train than epistemic humility, consideration of different perspectives/empathy, or balanced/dialectical thought? And what sort of educational environment (real or simulated) is the best way to do so? Currently, it is not sufficiently clear whether epistemic or social cognitive aspects of wisdom-related PMC are easier to train, and whether personal reflection (e.g., through journaling or mindfulness meditation) or social classroom dialog (e.g., about moral dilemmas) will be the best way to do so.

Moreover, there are questions about the role of the socio-cultural context for wisdom education. The role of cultural context is especially relevant in light of the didactic approaches of presenting students with "wisdom exemplars" (Grossmann, 2017a). In particular, it may be important to adapt wisdom education to culturally salient frames of reference. Exemplars' morality and wisdom are often contingent on the cultural-historical context: Individuals presented as exemplars of wisdom in one cultural context may be viewed as exemplars of hubris or even folly in another (Grossmann, 2017a). It is possible that effective teaching for wisdom through exemplars requires the nurturing of meta-cognitive skills akin to PMC. As an example, students may be tasked to evaluate the historical or situational reasons for

interpretation of certain exemplary actions are "wise," and other actions are "foolish." Or, students may examine situations in which wisdom exemplars failed to show wisdom, and reflect on how various motivations, interests, or cognitive abilities and norms may have influenced persons' actions.

Finally, some behavioral scientists have recently proposed that successful education in the domain of judgment and decision-making may require the engineering of real or virtual social environments in a way to foster optimal decisions (e.g., Thaler & Sunstein, 2009), raising the questions of "nudging" for wisdom. Preliminary insights about the role of social contexts for expression of the common wisdom characteristics (for review, Grossmann, 2017a) suggest that social context interventions for wisdom may be effective: Individuals appear to express greater wisdom in social contexts involving close others as compared to situations involving strangers (Grossmann et al., 2016); wisdom is also relatively heightened when considering problems involving others as compared to personal situations (Grossmann & Kross, 2014). Similarly, application of mental strategies fostering meta-cognition such as decentering (Bernstein et al., 2015; Kross & Ayduk, 2017) appear to foster wisdom (Kross & Grossmann, 2012). Successful implementation of these insights into fully-fledged social context interventions will require substantial, larger-scale efforts involving multiple stake-holders in academia and practice. Further work is also needed to evaluate the relative success of such interventions compared to conscious boosts (Hertwig & Grüne-Yanoff, 2017), or deliberate training programs oriented toward shifting underlying meta-cognitive dispositions.

Summary and Conclusion

For laypersons and some scientists, wisdom can mean many things (Grossmann & Kung, 2018; Sternberg & Glück, 2019). Conceptualizations of wisdom often appear idiosyncratic, reflecting culture-bound attitudes toward abilities (Dweck, Chiu, & Hong, 1995; Rattan, Savani, Naidu, & Dweck, 2012), favored leadership styles (House et al., 2004), or culturally-relevant moral characteristics (e.g., Graham, Haidt, & Nosek, 2009; Miller et al., 1990). These considerations notwithstanding, empirically oriented wisdom scientists around the world converge of a set of morally-grounded aspects of meta-cognition as a common psychological signature of wisdom. Building on the commonalities across many construct operationalizations in empirical sciences, the Wisdom Task Force has proposed the common wisdom model, defining wisdom's psychological characteristics as morally-grounded excellence in social-cognitive processing. The task force established that by excellence in social-cognitive processing empirical scientists typically refer to PMC—i.e., features of meta-comprehension and meta-reasoning that apply to problem-solving in domains that have consequences for other people. By moral grounding, empirical wisdom scholars typically refer to a set of inter-related aspirational goals: balance of self- and other-oriented interests, pursuit of truth (vs. dishonesty), and orientation toward shared humanity. Future generations of psychological scientists can build on these insights, establishing a common language for a psychometrically sound construct operationalization across multiple levels of analysis (e.g., state vs. trait), and with an eye toward possible ways to nurture wisdom in challenging times.

Data availability

All data and statistical analyses that support the findings of this study are publicly available on Open Science Framework website with identifier https://osf.io/c37yh/.

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Appendix

Commonly agreed-upon definition of wisdom in empirical research

According to the most recent gathering of major stakeholders in the empirical science of wisdom (Toronto Wisdom Task Force, 2019), scholars converge on the idea that wisdom chiefly concerns morally-grounded excellence in social-cognitive processing. By moral grounding we mean a set of inter-related aspirational goals: balance of self- and other-oriented interests, pursuit of truth (vs. dishonesty), and orientation toward shared humanity. By excellence in social-cognitive processing we specifically refer to the application of certain forms of meta-cognition to reasoning and problem-solving in situational domains that have the potential to affect other people:

- context-adaptability (e.g., practical or pragmatic reasoning, optimization of behavior to achieve certain outcomes),
- perspectivism (e.g., consideration of diverse perspectives, foresight and long-term thinking),
- dialectical and reflective thinking (e.g., balancing and integration of viewpoints, entertaining opposites),
- epistemic humility (e.g., unbiased/accurate thinking, seeing through illusions, understanding one's limitations)

We acknowledge that wisdom-related processes can be operationally captured across multiple levels of analysis: (i) as manifestations in response to specific issues at hand; (ii) as dispositional tendencies; (iii) as autobiographical reflections on past experiences; (iv) as represented in cultural-historical narratives. A comprehensive understanding of wisdom and how it manifests benefits from the examination of contextual and biological factors enabling and facilitating aforementioned processes.