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Wisdom, Bias, and Balance: Toward a Process-Sensitive Measurement of Wisdom-Related Cognition

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Philosophers and behavioral scientists refer to wisdom as unbiased reasoning that guides one toward a balance of interests and promotes a good life. However, major instruments developed to test wisdom appear biased, and it is unclear whether they capture balance-related tendencies. We examined whether shifting from global, de-contextualized reports to state-level reports about concrete situations provides a less biased method to assess wise reasoning (e.g., intellectual humility, recognition of uncertainty and change, consideration of the broader context at hand and perspectives of others, integration of these perspectives or compromise), which may be aligned with the notion of balancing interests. Results of a large-scale psychometric investigation (N = 4,463) revealed that the novel *S*ituated *WI*se Reasoning *S*cale (SWIS) is reliable and appears independent of psychological biases (attribution bias, bias blind spot, self-deception, and impression management), whereas global wisdom reports are subject to such biases. Moreover, SWIS scores were positively related to indices of living well (e.g., adaptive emotion regulation, mindfulness), and balancing of cooperative and self-protective interests, goals (influence-vs.-adjustment), and causal inferences about conflict (attribution to the self-vs.-other party). In contrast, global wisdom reports were unrelated or negatively related to balance-related measures. Notably, people showed modest within-person consistency in wise reasoning across situations or over time, suggesting that a single-shot measurement may be insufficient for whole understanding of trait-level wisdom. We discuss theoretical and practical implications for research on wisdom, judgment and decision making, well-being, and prosociality.

Keywords: reasoning, goal conflict, conflict resolution, prosociality, person-situation

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Throughout human history, people from different philosophies, cultures, and religions have considered wisdom as a supreme and valuable concept (Assmann, 1994; Birren & Svensson, 2005). Wisdom has been linked to pragmaticism (Baltes & Smith, 2008), reduced bias (McKee & Barber, 1999), bigger-picture, prosocial orientation (Baltes & Smith, 2008; Staudinger & Glück, 2011; Vervaeke & Ferraro, 2013), and is often used in reference to historical exemplars who have remarkable acumen into matters of social life (e.g., Buddha, Gandhi, or Martin Luther King, Jr.; Weststrate, Ferrari, & Ardelt, 2016).

Contemporary behavioral scientists characterize wisdom through unbiased thought, which is conducive to working through challenging life situations (Baltes & Staudinger, 2000; Grossmann, Na, Varnum, Kitayama, & Nisbett, 2013; McKee & Barber, 1999; Staudinger & Glück, 2011; Sternberg, 1998). Examples of such thought involve intellectual humility, recognition of world in flux and change, and consideration of the bigger picture beyond immediate self-interest (Basseches, 1984; Clayton, 1983; Grossmann, 2017; Staudinger & Glück, 2011). Quantitative information about wisdom-related thought can be useful for a wide range of fields, including decision making, conflict management and negotiation, counseling, living well, and would be beneficial to anyone who wishes to work through a difficult challenge and improve their well-being (Grossmann, Na, Varnum, Kitayama, & Nisbett, 2013). Indeed, contemporary scholars and practitioners have called for wisdom in many challenging social domains, including education, conflict resolution, leadership, and business (Baltes & Smith, 2008; Goold & Campbell, 1998; Haque, 2010; Nonaka & Takeuchi, 2011; Rooney & McKenna, 2008; Staudinger & Glück, 2011; Sternberg, 2010).

Despite broad interest in wisdom, empirical inquiry into this topic has been constrained by methodological limitations and a nonalignment between dominant theoretical propositions about wisdom and their measurement. The methodological limitation chiefly concerns the lack of consensus about how to measure wisdom. Some scholars advocate measuring wisdom-related characteristics via intensive observer-based evaluations of people's narratives (Baltes & Smith, 2008; Baltes & Staudinger, 2000; Bluck & Glück, 2004; Grossmann et al., 2010; König & Glück, 2014; Kunzmann & Baltes, 2003; Mickler & Staudinger, 2008).

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However, such observer-based evaluations require costly narrative analysis techniques and, therefore, remain limited in their ecological application for large-scale investigations. Conversely, other scholars (e.g., Ardelt, 2003; Levenson, Jennings, Aldwin, & Shiraishi, 2005; Park & Peterson, 2008; Webster, 2003) advocate using single-shot self-report questionnaires assessing wisdom-related characteristics that are socially desirable. In these tests, people are instructed to report on their global tendencies to be reflective, to show benevolence toward others, to perspective-take, or to report on other desirable characteristics. This approach, while easier to administer than observer-based methods, does not factor in the dynamic nature of wisdom-related characteristics (Staudinger & Glück, 2011), precluding context-sensitive assessment within individuals and across specific states (Dunlop, 2015; Fleeson & Jayawickreme, 2015; Fleeson & Noftle, 2008b, 2012).

The theory-measurement nonalignment concerns the question of the criterion against which wisdom-related characteristics should be evaluated. Numerous theorists have proposed that wisdom-related thought is critical for balancing various interests and trade-offs in the process of making important life decisions. The notion of balancing various interests is central to Sternberg's balance theory of wisdom (Sternberg, 1998), Baltes and colleagues' notion of managing uncertainties (Baltes & Smith, 2008), Ardelt's multidimensional wisdom theory (Ardelt, 1997), Grossmann's work on person-context interaction in expression of wise thought (Grossmann, 2017, in press), and earlier works by Clayton (1975), and Kitchener and Brenner (1990). Despite the centrality of the notion of balancing interests to the wisdom construct, this link has remained theoretical (e.g., Clayton, 1975; Grossmann, 2017; Sternberg, 1998) or implicit (e.g., Ardelt, 1997; Baltes & Smith, 2008; Kitchener & Brenner, 1990). In particular, there has been little effort to explicitly use balance-related criteria to evaluate the hypothesized effectiveness of wisdom-related cognitive processes. To an extent, this void in empirical research on the relationship between wisdom and balancing-related criterion may be attributed to methodology: Dominant global measures of wisdom conceptualize wisdom-related characteristics as an *outcome* of being balanced without ever testing this quality, and they lack precision in measurement to evaluate the actual *state* of balancing interests.

Building on advances in survey methodology and the psychology of wisdom, we introduce a novel, hybrid method for assessing aspects of thought that philosophers and behavioral scholars have associated with wisdom (henceforth "*wise reasoning*;" Grossmann, 2017). The new method aims to minimize the social desirability biases associated with global self-reports by grounding the assessment in the context of respondents' concrete experiences, versus focusing on global, decontextualized characteristics. To optimize the method, we incorporated the efficiency of self-report scales with the potential for ecological and construct validity that can be achieved with performance assessments and experience sampling (Kahneman, Krueger, Schkade, Schwarz, & Stone, 2004; Schwarz, Kahneman, & Xu, 2009). The new hybrid method enabled us to conduct the first large-scale evaluation of state-level wise reasoning, focusing on social challenges (work-related challenges and interpersonal conflicts) people encounter in their lives. We evaluate the utility of this method (vis-à-vis global wisdom measures) against markers of social–cognitive bias as well as the process of balancing goals and causal judgments.

Defining Wise Reasoning

In lay terms, wisdom can mean many things, ranging from rationality and intellect, to leadership qualities, to knowledge drawn from traumatic life experiences (Grossmann, 2017; Staudinger & Glück, 2011). Notably, philosophers and psychological scientists view general knowledge or intelligence as insufficient for wisdom (Ardelt, 2004; Baltes & Kunzmann, 2004; Baltes & Smith, 2008; Baltes & Staudinger, 2000; Jeste et al., 2010; Kekes, 1983; McKee & Barber, 1999; Sternberg, 1998; Vervaeke & Ferraro, 2013). Rather, psychological scientists interested in wisdom have proposed to examine specific processes involved in understanding and navigating one's social world—aspects of reasoning involved in the context-sensitive processing of knowledge (Baltes & Smith, 2008; Baltes & Staudinger, 1993; Grossmann, 2017; Vervaeke & Ferraro, 2013). As Sternberg (1998, p. 353) pointed out, "information processing in and of itself is not wise or unwise. Its degree of wisdom depends on the fit of a wise solution to its context." Dynamic processing of knowledge is particularly important for flexibly navigating life's uncertainties (Baltes & Kunzmann, 2004; Baltes & Smith, 2008; Baltes & Staudinger, 2000; Grossmann, Na, Varnum, et al., 2013).

The study of cognitions involved in a wise judgment started with Clayton (1975, 1983), who defined wisdom as a tendency to understand and accept paradoxes and contradictions that mark social situations, guided by the principle of dialectical thinking (i.e., the recognition that the world is in flux and, therefore, changes). Clayton (1983) proposed that dialectical thinking can enable individuals to identify relationships and even commonalities between seemingly conflicting interests. Invoking dialecticism allowed Clayton to distinguish between wisdom and domain-general cognitive abilities characterizing rational/analytical thought (e.g., intelligence). Specifically, domain-general abilities draw on symbolic rules and procedures such as propositional logic (Peng & Nisbett, 1999; Piaget, Inhelder, & Piaget, 2013) that are (better) suited for solving *well-structured* problems (e.g., Haugeland, 1989). In contrast, *ill-structured* problems (e.g., those involving value trade-offs, incomplete information for a decision, unclear means or end-goals or problems with missing information about initial- or goal-states, or means to a solution; cf. Jonassen, 1997; Simon, 1973) are more complex and dynamic and, therefore, they are harder to resolve via processes like symbolic and propositional logic. Rather, they require open, nuanced, and dynamic processing of information (Clayton, 1983; Hieronymi, 2013; Sinnott, 1984, 1989). More important, the problems encountered in everyday social life (even the relatively simple ones) can often be characterized as ill-structured (Allaire & Marsiske, 2002; Frensch & Funke, 2014; Mienaltowski, 2011). Later empirical work has built on the claim of relative insufficiency for domain-general abilities for resolving social challenges, demonstrating that abstract cognitive abilities, executive functioning, and rationality are not sufficient for wise reasoning (Grossmann, Na, Varnum, et al., 2013; Grossmann, Sahdra, & Ciarrochi, 2016; Staudinger, Lopez, & Baltes, 1997; Sternberg, 1998).

Building on the earlier work by neo-Piagetian developmental psychologists (Basseches, 1980, 1984; Clayton, 1983; Kitchner, 1983; for a review, see Kallio, 2015), Baltes and colleagues defined wisdom as "excellence in mind and virtue . . . an expert knowledge system [for] dealing with the conduct and understand-

ing of life" (Baltes, 2004; Baltes & Smith, 2008). In their view, "an expert knowledge system" concerns an individual's ability to understand and manage challenging life situations. This ability draws from characteristics of reasoning such as consideration of the relationship between varied contexts of life and how they change over time; the recognition that values and life goals differ between individuals and groups, and acknowledgment of the uncertainties of life, together with ways to manage those uncertainties. Other scholars (Grossmann et al., 2010; Kramer, 2002) have specified aspects of wisdom-related cognition involved in dialectical, self-transcendent reflection on ill-structured problems: intellectual humility, acknowledgment of different points of view, appreciation of the context within which the issue unfolds, sensitivity to the possibility of change in social relations, acknowledgment of the likelihood of multiple outcomes of a conflict, and preference for compromise in resolving opposing viewpoints. Recent reviews suggest that these aspects of reasoning appear across a wide range of definitions of wisdom in behavioral sciences (Bangen, Meeks, & Jeste, 2013; Grossmann & Kung, in press).

Balancing Interests as a Criterion of Wise Reasoning

The notion of balancing interests unites different theoretical models of wisdom in general, and wise reasoning in particular. For instance, Sternberg's (1998) influential balance theory of wisdom has pointed to various intrapersonal, interpersonal, and extrapersonal goals, long- and short-term plans, and goals of adjusting to versus influencing one's environment (Sternberg, 1998, 2003). The centrality of balancing to wisdom goes beyond Sternberg's conceptualization. Indeed, when summarizing the last few decades of psychological wisdom research, Staudinger and Glück (2011) concluded that:

> Wisdom concerns mastering the basic dialectics shaping human existence, such as the dialectic between good and bad, positivity and negativity, dependency and independence, certainty and doubt, control and lack of control, finiteness and eternity, strength and weakness, and selfishness and altruism. (p. 217)

Such dialectics, or trade-offs, are especially pronounced in ill-structured situations, with wise reasoning conceptualized as a process promoting balance between these conflicting interests (Achenbaum & Orwoll, 1991; Grossmann, 2017).

Parallel ideas about the centrality of balancing as an outcome of managing ill-structured complexities of human life have also been discussed in the adult developmental literature on identity development. For instance, Erikson (1984) conceptualized wisdom as a form of personal maturation promoting mastery of uncertainties involved in the later-life crisis of integrity versus despair. Like other psychoanalytic theorists (e.g., Jung, 1965), Erikson suggested that such self-development is oriented toward balancing seemingly opposed desires and transcending the limitations of the egoistic self. Subsequent empirical scholars have expanded on Erikson's ideas when measuring developmental maturation (e.g., Ryff & Heincke, 1983; Ryff & Keyes, 1995) and wisdom-related personality characteristics (e.g., Helson & Wink, 1987; Wink & Helson, 1997).

It appears that despite different theoretical assumptions, various perspectives on wisdom share a great deal in common in their focus on balancing interests (for a review, see Grossmann, 2017). Psychometrically speaking, balancing of interests can be considered as a criterion to evaluate the incremental validity of existing measures of wisdom.[1]

Measuring Wise Reasoning: Extant Views and Challenges

Observer-Based Evaluations of Narratives

To assess wisdom-related cognition, Baltes and colleagues (Baltes & Kunzmann, 2004; Baltes & Smith, 2008; Baltes & Staudinger, 1993, 2000; Kunzmann & Baltes, 2003; Staudinger & Glück, 2011; Staudinger et al., 1997; Staudinger, Smith, & Baltes, 1994) have proposed to examine how people reflect on difficult social situations. In their paradigm, participants are instructed to provide "stream-of-thought" reflections on what should be done in response to hypothetical life situations (e.g., a dilemma between family and job). Subsequently, trained coders perform narrative analyses of participants' responses, scoring responses regarding the application of certain aspects of wisdom-related cognition described above. Similarly, in a paradigm developed by Grossmann and colleagues (Grossmann et al., 2012, 2013; Kross & Grossmann, 2012), participants verbally reflect on interpersonal or intergroup conflict scenarios, responding to a set of prompts (e.g., What do you think will happen next? Why will it happen in that way? What do you think should be done in the situation?). Again, trained coders rate participants' narratives across various aspects of wise reasoning, including intellectual humility, recognition of uncertainty and change, consideration of multiple ways a situation could unfold, appreciation of others' perspectives, consideration of/search for compromise, and acknowledgment of the importance of conflict resolution.

The strengths of observer-based evaluations center around their potential to focus on wisdom-related cognitions in situ—studying how people reason in the context of concrete situations (Grossmann & Kross, 2014; Kross & Grossmann, 2012; Kunzmann & Thomas, 2014; Staudinger & Baltes, 1996)—understanding of which is essential for gaining insights into the dynamic nature of wisdom (Staudinger & Glück, 2011). At the same time, this approach to assessing wise reasoning has several drawbacks. Recording of stream-of-thought reflections is not viable in the context of acute social challenges, limiting the utility of observer-based evaluations for ecological assessment of wise reasoning across a range of situations. Further, it can be impractical because of the costs and high levels of researcher burden when evaluating respondents' narratives (Glück et al., 2013), with a substantial time investment into the training of raters to establish interrater reliability and to score the narratives. Indeed, observer-based evaluations of narratives are typically constrained to small to moderate sample sizes ($N < 150$). Finally, observer-based evaluations of

[1] Theoretically, it is also possible that balance is a central indicator of wisdom *writ large*. Thus, when testing whether the hypothesized wisdom-related characteristics reflect wisdom broadly defined, balance-related indicators represent the critical feature of the nomological network. Irrespective of one's theoretical position (balance as a criterion or as an outcome), a critical empirical step concerns evaluating the relations between a hypothesized wisdom-related characteristic and markers of balance. We aim to test these relations in the present work.

written or transcribed narratives often involve grounding of the coding categories in the nuances of specific scenarios, resulting in distinct coding systems for different situations. For instance, distinct codebooks are available for analyses of intrapersonal reflections (Mickler & Staudinger, 2008), reflections on prescriptive actions regarding interpersonal dilemmas (Baltes & Staudinger, 2000), reflections on interpersonal and intergroup conflicts (Grossmann et al., 2010), and reflections on political election outcomes (Kross & Grossmann, 2012). Though these codebooks overlap in their overarching content—the specific categories are some what idiosyncratic—which presents a challenge for direct comparability across content-analytic methods assessing wisdom. Thus, observer-based evaluations of narratives, while invaluable, have led to relatively underpowered studies, and preclude direct comparability and efficient use by the vast majority of researchers.

Global Self-Report Assessments

Given the methodological difficulties in conducting observer-based evaluations of wisdom, some scholars have proposed to assess wisdom by using global self-report questionnaires (e.g., Ardelt, 2003; Glück et al., 2013; Levenson et al., 2005; Webster, 2003), similar to those used when assessing personality. In these global evaluations, participants respond to items capturing personal wisdom (Glück et al., 2013). Depending on the scale, participants indicate their overall ability to reflect, to see different perspectives, to tolerate ambiguity, to be concerned with amicable conflict resolution, to be accepting of contradictions and irony of life, or ability to (self-) transcend immediate concerns and recognize that the world is in flux (Ardelt, 2003; Glück et al., 2013; Levenson et al., 2005; Webster, 2003).

This global self-report method for assessing wisdom suffers from many drawbacks. First, relying on participants' global, decontextualized self-evaluations, existing self-reports of wisdom do not reveal information about how people navigate specific challenges in their lives, thereby providing no insight into how wisdom may vary as a function of the situation. This is noteworthy, because contemporary standards in research on personality and individual differences suggest that the consideration of situation- (or state-) specific responses is essential for understanding the nature of personality constructs as a whole (e.g., Fleeson & Jayawickreme, 2015; Fleeson & Noftle, 2008b, 2012; Funder, 2009; McLean, Pasupathi, Greenhoot, & Fivush, 2017; Mischel, 2004; Mischel, Shoda, & Mendoza-Denton, 2002). For instance, Fleeson (2001) proposed a density-distribution account of personality—specifically, that traits should be conceived as frequency distributions of their corresponding states. Accumulating over time and across situations, a person's distribution of states indicates the typical frequency with which the individual is at each level of the state. Modern personality psychologists (Fleeson & Noftle, 2008b, 2012; Mischel, 2004; Mischel & Shoda, 1995; Mischel et al., 2002) recommend examining people in concrete situations, preferably several times, to draw inferences about the reliability of general tendencies (i.e., traits).

Second, global self-evaluations require participants to filter through and condense years of experience to derive an overall portrait of the self, resulting in bias toward casting the self in a positive light (Dunning, Heath, & Suls, 2004; Kihlstrom, Eich, Sandbrand, & Tobias, 2000; Wilson & Bar-Anan, 2008). Indeed, when self-assessing highly desirable qualities such as wisdom (Assmann, 1994) in a de-contextualized fashion, participants may be more tempted to respond in a socially desirable fashion by exaggerating, faking, and lying, in part driven by involuntary self-deception (Paulhus & Vazire, 2007; Vazire & Carlson, 2010). Self-biased responding and memory distortions are of particular relevance when measuring wisdom, because the central pillars of wisdom concern intellectual humility and the absence of bias (Glück et al., 2013; Staudinger & Glück, 2011). Ironically, it appears that the global self-report approach to wisdom is most likely to be contaminated by psychological biases (Taylor, Bates, & Webster, 2011; Zacher, McKenna, & Rooney, 2013), the absence of which the scales aim to explore (Glück et al., 2013; Staudinger & Glück, 2011).

Current Research: A State-Level Hybrid Method of Wise Reasoning

In the present article, we introduce a state-level method that integrates the in situ advantages of observer-based evaluations with the convenience of self-report assessments, enabling a high-powered exploration of state-level variability in wise reasoning and its relationship to balancing of interests and desires. To avoid potential biases associated with global self-reports, we build on recent advances in survey methodology, concerning the event-reconstruction of specific experiences (Kahneman et al., 2004; Schwarz et al., 2009).

Event-Reconstruction Protocol

The chief methodological challenge with self-report assessments concerns difficulty with gaining reliable self-insight when assessing global tendencies, which leads to memory bias and desirability-related distortions in responding (Kahneman et al., 2004; Schwarz et al., 2009). One way to facilitate accurate responding is to provide greater access to episodic memory by illuminating details with the help of recall cues concerning the "what," "where," "when," and "how" of the recalled experience (Robinson & Clore, 2002; Wagenaar, 1986). For instance, describing how the event has unfolded (rather than why it happened) can facilitate concrete reliving and re-experiencing of the episode (Kross & Ayduk, 2011; Trope & Liberman, 2010). Indeed, autobiographic self-reports adopting the event-reconstruction method—instructions to reconstruct the details of a specific episode before answering self-report questions about their experience—can approximate responses observed via ambulatory monitoring (e.g., experience-sampling; Grube, Schroer, Hentzschel, & Hertel, 2008; Kahneman et al., 2004; Schwarz et al., 2009; Stone & Litcher-Kelly, 2006). Notably, the event-reconstruction method appears well-suited for assessing thought-based components of a specific life experience (White & Dolan, 2009). On the basis of these insights, we propose a hybrid method for assessing wisdom-related thought about concrete situations, combining a self-report approach with the recently developed event-reconstruction technique to reinstate the social experiences (Schwarz et al., 2009).

State-Level Method to Assess Wise Reasoning

The new hybrid method cues participants to recall an interpersonal conflict that they experienced. To maximize precision in

recall, we ask participants to recall a recent episode (Schwarz & Oyserman, 2001). Respondents are then guided to reconstruct features of the conflict experience by answering questions about the what, where, when, and how of the situation, including the thoughts and feelings they experienced. This reconstruction process aims to increase accuracy and reduce bias in the recall of the experience. Finally, respondents answer questions designed to assess wise reasoning, tapping into intellectual humility, recognition of a world in flux and change, appreciation of different perspectives, application of an outsider's vantage point, consideration of and search for compromise and conflict resolution.

Research Overview

We conducted a large-scale study exploring the utility of the state-focused method (vis-à-vis global scales) for assessing wisdom-related cognition in an unbiased fashion. Study flow is described in Figure 1. In the first step, we examined the internal reliability of the state-level measure of wise reasoning. In the second step, we examined intraindividual stability (vs. variability) in wise reasoning across several situations encountered by the same person. We also examined its construct validity: we assessed convergence of hybrid method scores with scores obtained from the existing global wisdom scales, observer-based performance scores of wise reasoning, and reasoning about an intergroup conflict. Further, we examined the relative associations between the state-level method (vs. global wisdom scales) and markers of psychological bias. To expand the nomological network (Cronbach & Meehl, 1955) of wise reasoning, we further assessed how wise reasoning is related to markers of adaptive emotion regulation, mindfulness, and prosocial orientation (e.g., agreeableness, communal relationship orientation).

In the third step, we tested the relation between wise reasoning scores and various indicators of balance, including balancing cooperative and self-protective intentions (Kelley & Stahelski, 1970), balancing influence versus adjustment goals (Sternberg, 1998; also see Heckhausen, Wrosch, & Schulz, 2010), balancing various social inferences about the world (Nisbett & Ross, 1980; Gilovich & Ross, 2015), and balancing various conflicts in one's life (Carlson, Kacmar, & Williams, 2000). Finally, we tested the role of demographic and situation-specific contexts for wise reasoning.

General Procedure and Samples

We recruited participants from a diverse demographic background and different conflict situations (i.e., workplace conflicts, conflicts with a friend) to increase the generalizability of the results. Table 1 includes demographic information for each sample included in the current study. Some participants (Samples A–F, and I) were recruited via Amazon Mechanical Turk (MTurk) platform. For MTurk samples (N = 3,195), we restricted recruitment to native English-speaking adults (age of majority >17 years in the United States) to reduce the impact of potential confounds related to life experience, language comprehension, and cultural differences. Our research tested wise reasoning in different social contexts. To examine wise reasoning in the workplace, the first two samples comprised full-time employees from a wide range of occupations (e.g., business, administration, construction, and food services). To examine wise reasoning in nonwork contexts, we instructed subsequent samples to reflect on recent interpersonal conflicts with a friend. In one sample (Sample E), in addition to the state-level measure of wise reasoning, participants completed a version of the state-level measure adapted to assess wise reasoning about an intergroup conflict (the 2014 political revolution in Ukraine) and provided their thoughts about the same conflict via open-text responses. Participants from these six samples were compensated $0.50 for their participation.

To replicate the psychometric structure of state-level wise reasoning beyond MTurk, we also sampled undergraduate students at the University of Waterloo, Canada (Samples G and H; N = 968). A subgroup of these students completed an alternate, global (i.e., decontextualized) version of the wise reasoning scale items, to compare its relative susceptibility to biased responding. Students received course credit for their participation. Finally, to generalize our findings to a broader population, we recruited a nonstudent community sample (Sample J; N = 300) on Prolific Academic (ProA), a recently established United Kingdom based crowdsourc-

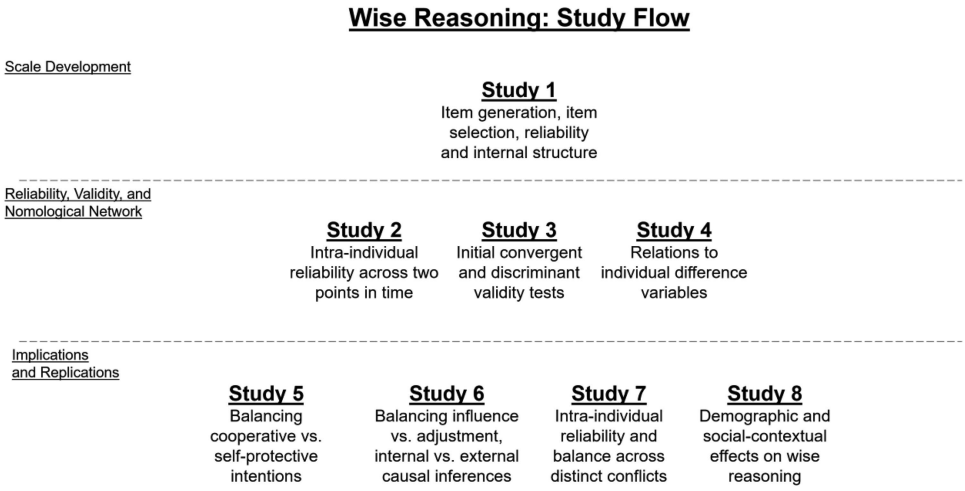

Figure 1. Study flow for the current research.

Table 1
Sample Characteristics

Context	Sample A workplace	Sample B workplace	Sample C interpersonal	Sample D interpersonal	Sample E interpersonal and intergroup	Sample F interpersonal	Sample G interpersonal (students)	Sample H global (students)	Sample I interpersonal or workplace	Sample J workplace and interpersonal
Recruited *N*	653	629	398	773	278	340	532	501	619	300
Valid *N*	404	469	398	730	240	340	467	501	614	300
Age *M* (*SD*)	32.25 (10.26)	32.09 (10.20)	31.51 (10.19)	33.38 (11.73)	29.90 (7.81)	34.35 (12.45)	20.04 (3.51)	20.05 (1.18)	37.82 (13.60)	37.60 (12.51)
Gender (% ♀)	48.26	49.25	58.54	64.93	52.5	55.58	54.81	39.32	56.10	55.30
Ethnicity (%)										
Asian-American	5.69	6.60	5.52	4.10	8.89	5.29			6.40	
African-American	9.65	9.38	8.04	6.98	6.68	7.05			9.20	
White	73.76	72.92	78.39	76.02	74.72	80.00			77.80	
Latino	4.45	7.03	4.77	4.38	6.03	5.88			6.60	
Other	6.43	4.05	3.26	4.52	3.83	1.76			–	
Median income ($)		35,001–50,000	35,001–50,000	35,001–50,000	25,001–35,000	35,001–50,000			50,001–75,000	
Education (%)										
High school		13.60	14.65	12.00	9.95	11.47			12.00	17.00
Some college		31.03	35.22	35.14	34.33	29.12			28.50	18.00
College		44.87	38.05	38.57	39.30	44.12			45.80	51.70
Post-grad		10.50	12.08	14.29	16.42	15.29			13.70	13.30
Med t (survey)	15.36	20.07	11.51	24.67	20.43	7.27	23.26	16.00	17.00	20.00

Note. Valid N = participants who passed screening criteria and completed the study. Percentages by socio-demographic group reflect proportion of Valid N in the respective sample. Because of administrative error, income and education questions were not included in Samples A, G, and H, and ethnicity questions were also not included in samples G and H. Sample J ethnicity and income not included due to cross-country differences in meaning of ethnic group, currency, average population income, and its utility.

ing platform, developed at Oxford University specifically for accommodating researcher needs. ProA matches researchers with a community sample of individuals willing to complete studies for reimbursement. We selected ProA because it retains a more diverse pool of participants of nonstudent adults from Europe as well as North America, shown to be more naïve and conscientious compared with MTurk workers (Peer, Brandimarte, Samat, & Acquisti, 2017). These participants were compensated 2.5£ for 30 min of their time.

Study 1: Scale Development

The purpose of Study 1 was to develop a *S*ituated *WI*se reasoning *S*cale (SWIS). First, we designed a set of 46 items—each assessing one of the pre-existing theoretical aspects of wise reasoning—and conducted principal components analyses and principal axis factoring to trim the scale. Second, we tested the hypothesis that each aspect of wise reasoning would covary with the others, and would relate to a latent wise reasoning construct. Finally, we tested alternative factor structures of wise reasoning.

Ethics Review Board Statement

This study was approved by a University of Waterloo Research Ethics Committee (Title of the study: Test of materials for future study; Protocol #18966). Informed consent was obtained from all participants. This research was carried out following the recommendations of the Human Research Ethics Committee at the University of Waterloo, Canada, with written informed consent following the Declaration of Helsinki.

Method

Wise reasoning assessment.

Event reconstruction. We asked participants to reconstruct a specific, recent life experience before responding to the scale items. Our instructions mirrored existing event-reconstruction methods that facilitate accurate recall (Kahneman et al., 2004; Schwarz et al., 2009). First, participants recalled a difficult situation—a single conflict situation or disagreement instead of a recurring problem—that happened between them and a workmate (Samples A and B) or with a friend (Samples C–G) in the past few months. We selected work conflicts for our initial samples because social conflicts are frequent in the workplace (Andersson & Pearson, 1999; Estes & Wang, 2008). Participants then reflected on what they thought and felt during that difficult situation. To increase the accuracy of recall, participants were guided by questions that helped them reconstruct the context of their experience (e.g., "Where were you at the time?"; supplemental material Table 14).

Situated WIse Reasoning Scale (SWIS). After the event reconstruction task (and after being reminded of anonymity and confidentiality, to minimize social desirability influence; Paulhus & Vazire, 2007; Podsakoff, MacKenzie, & Podsakoff, 2012), participants reported the extent to which they used different reasoning strategies during the event. In the item selection phase, these strategies represented a set of 46 items (9 reverse coded) concerning wise reasoning (Baltes & Smith, 2008; Basseches, 1980, 1984; Grossmann et al., 2010, 2013; Grossmann & Kross,

2014; Kross & Grossmann, 2012; Kramer, 1990; Labouvie-Vief, 1982; Riegel, 1973; Staudinger & Glück, 2011; Sternberg & Jordan, 2005). To generate items, we built on prior work (Grossmann, 2017; also see Bangen, Meeks, & Jeste, 2013) characterizing wise reasoning through a set of interrelated facets that provide a base for a single, second-order factor: (a) *intellectual humility/recognition of the limits of one's knowledge* (e.g., "Looked for any extraordinary circumstances before forming my opinion"; 10 items), (b) *consideration of change* (e.g., "Looked for different solutions as the situation evolved"; 8 items), (c) *consideration of multiple ways a situation may unfold* (e.g., "Believed the situation could lead to a number of different outcomes"; 6 items), (d) *recognition of others' perspectives* (e.g., "Made an effort to take the other person's perspective"; 6 items), (e) *consideration of/search for compromise* (e.g., "Tried my best to find a way to accommodate both of us"; 6 items), (f) *recognition of importance of conflict resolution* (e.g., "Tried to anticipate how the conflict might be resolved"; 5 items), and (g) *application of an outsider's viewpoint* (e.g., "Tried to see the conflict from the point of view of an uninvolved person"; 5 items). A complete list of original items is presented in Table 1 in the supplementary online materials. Participants answered the following question, "While this situation was unfolding, I did the following . . ." by rating items on a 5-point scale (1 = *not at all*, 3 = *somewhat*, 5 = *very much*).

Sample A completed the original set of 46 items. Sample B completed the reduced set of wise reasoning items and 7 new items that seemed plausible in a conflict situation yet were theoretically unrelated to wisdom-related cognition (see supplementary material Table 10), to test whether their inclusion altered the responses to original items. Samples C–G, I, and J completed the final 21 items (see Appendix). Depending on the sample, participants also completed a battery of other measures, described fully in subsequent studies. To minimize responder burden, each participant completed only a subset of the measures, such that the total completion time would not extend over 30 min.

Results

Item reduction. We aimed to select 2–4 items for each aspect of wise reasoning. Together, these aspects would capture the hypothesized single, second-order latent wise reasoning construct. To this end, we analyzed Sample A responses. Our plan for item-selection integrated theoretical and empirical insights. First, we designed a set of items capturing the most frequently mentioned cognitive aspects of wisdom (e.g., Bangen et al., 2013; Grossmann et al., 2010). To maximize the coverage and utility of the SWIS, our goal was to select the items that apply to most situations. In the subsequent empirical step, we selected items based on factor analytic methods, to reveal the items that covaried best with each other and the first- and second-order wise reasoning constructs. This empirical step was imposed to avoid researcher bias (e.g., tendency to select subpar items, based on personal speculation). At the same time, we remained mindful of theory and therefore eliminated items if they adhered together empirically, for nontheoretical reasons (e.g., negatively worded items). Thus, through this combination of a priori theorizing and empirical procedures, we were able to retain the items that reflect the most common ecologically sensitive expression of wise thought, though not every unique and possible way wise reasoning could be expressed.

The complete analytic protocol, including each step of the item reduction procedure, is presented in the online supplement (Tables 2–6). First, we conducted a preliminary principal component analysis on all items, using eigenvalues >1 and Promax rotation, to determine the presence of any problematic items or conceptually unrelated components (e.g., results of psychometric artifacts rather than aspects of wise reasoning) (Jolliffe, 2002). This process revealed eight components, two of which identified reverse coded items, and not any particular aspect of wise reasoning. The presence of components that consisted solely of reverse-coded items suggested that participants responded similarly to these items because of their negative wording. Therefore, we removed reverse-coded items from further analyses.

Next, we conducted iterated principal axis factoring analyses, to determine the 2–4 items that best represented just one of seven aspects (Child, 2006; Floyd & Widaman, 1995; Furr & Bacharach, 2014) of wise reasoning. Our a priori prediction was that each aspect of wise reasoning would covary and load onto a single, second-order latent factor. Thus, we imposed a 7-factor solution and utilized Promax rotation to allow the factors to correlate. At each iteration, we removed items that did not load strongly onto a single factor (i.e., coefficients <.4; e.g., Cohen, Wolf, Panter, & Insko, 2011), or that cross-loaded substantially on more than one factor (<.2 difference between loadings on different factors). We repeated this process until only the highest-ranking 2–4 items in each of the seven wise reasoning factors remained (i.e., to allow approximately equal weighting per aspect or factor). The item-reduction process resulted in 27 items explaining 62.02% of the total variance (supplementary material Table 6).

To further reduce the initial set of items to approximately equal item-weighting between aspects of wise reasoning (i.e., 2–4 items per aspect), we conducted structural equation modeling, using AMOS 22.0.0 for SPSS. We used standard criteria to assess the 7-factor model, including standardized root mean square residual (RMSR) <.10, root mean square error of approximation (RMSEA) <.08, comparative fit index (CFI) >.95, and probability of close fit (PCLOSE) >.05 (Hu & Bentler, 1999; Meyers, Gamst, & Guarino, 2006). According to these guidelines, results of the confirmatory factor analysis (CFA) suggested that the initial 7-factor model could be improved (i.e., PCLOSE <.01). We eliminated items that did not fall in the factor expected by the theoretical model of wise reasoning, or that exhibited the greatest frequency of standardized residual covariance >.4. This process resulted in items 4, 6, 8, 14, 24, and 42 being removed from the model. We also covaried individual-item error terms with high modification indices (Kenny, 2016). The 21-item model indicated good fit, RMSR = .046, RMSEA = .036, CFI = .983, and PCLOSE = .997. Item loadings for the final 21 items in Sample A are presented in Table 2.

Replicating the internal structure of wise reasoning in follow-up samples. In Sample B we included seven distractor items (supplementary material Table 10), designed to be high in face validity but without theoretical relation to wisdom, and interspersed them with the reduced set of 21 wise reasoning items. We tested whether including such items would disrupt the original dimension loadings found in our initial model. Using principal

Table 2
Principle Axis Factoring on Final 21 Wise Reasoning Items (Sample A)

	Factor						
Item number	1	2	3	4	5	6	7
1	.59						
2	.41				.35		
3	.90						
4	.68						
5		.94					
6		.84					
7			.85				
8			.94				
9				.81			
10				.88			
11				.51	.23		
12				.38			
13					.64		
14					.77		
15					.82		
16						.69	
17						.92	
18							.84
19							.81
20							.90
21							.84

component analysis on the responses from Sample B, we found that each of the distractor items either (a) clustered only with other distractor items, or (b) cross-loaded sufficiently onto multiple components to warrant discarding them from the analysis (supplementary material Table 11). More importantly, in subsequently principal component analysis with distractor items removed, factor structure found in Sample A was maintained in Sample B (supplementary material Table 12). More important, results of a follow-up CFA indicated that responses from Sample B converged well with those from Sample A. Specifically, we tested the identical 7-factor model as revealed from item-reduction in Sample A, finding a good model fit, RMSR = .045, RMSEA = .037, CFI = .978, and PCLOSE = .998.

Next, we present a large-scale CFA on responses from Samples C–F, as they were independent of the responses used for item-reduction and selection and initial confirmatory tests (Samples A and B). First, we tested the 7-to-1 factor model (i.e., seven first-order factors, one second-order factor) and found a good fit to the data. Next, we tested whether alternative models also exhibited good or better fit (supplementary material Figures 4–9). To this end, we systematically combined factors that had most conceptual overlap (e.g., multiple outcomes and change, compromise and resolution), to form the 5-to-1 and 6-to-1 factor models; these models were tested because they are similar to the initial 7-to-1 factor model, but with increased parsimony. We also examined a single-factor model, in which all items would load onto a single-order factor of wise reasoning. We tested this model on the notion that all aspects of wise reasoning together represented a unitary reasoning style. Furthermore, we included a two-factor model of social and cognitive wisdom, consistent with some prior theorizing (e.g., Meeks & Jeste, 2009; Takahashi & Bordia, 2000). In the latter model, intellectual humility, change, multiple outcomes, and outsider's vantage point comprised the cognitive factor and recognition of others' perspectives and search for a compromise and conflict resolution comprised the social factor.

All models exhibited acceptable fit. Because the different models are not nested and include structural differences in parameters (e.g., different latent factors), we examined the Akaike Information Criterion (AIC) measure of model fit. This index allows for comparison between the *relative* fit of different models (Kline, 1998), where lower AIC values represent better fit. As seen in Table 3, according to AIC, the 5-factor model exhibited the best relative fit and was therefore accepted as our present model of wise reasoning in interpersonal conflicts. Figure 2 shows the final model, in which a single *world in flux/change* dimension subsumes the dimensions of *change* and *multiple outcomes*, and in which a single *search for compromise/resolution* dimension subsumes the dimensions of *compromise* and *importance of resolution*. Factor loadings are presented in Table 4.

In the present study, we focus on wise reasoning as a single, second-order index. Our method to calculate scores ensures that each theoretical aspect of wise reasoning receives appropriate weighting based on data-reduction. Specifically, we compute wise reasoning scores by calculating the average of items from each of the five aspects of wise reasoning and conducting a principal component analysis on all five indexes, saving the resulting single

Table 3
Model Fit Indices for 1-, 2–5-, 6-, and 7-Factor Models of Wise Reasoning

Model	AIC	CMIN/DF	CFI	RMSR	RMSEA	PCLOSE
Single-factor model	1144.13	6.704	.972	.052	.047	.974
2-Factor model	1334.85	7.165	.965	.061	.049	.822
5-Factor model	1087.21	6.617	.969	.057	.046	.990
6 Factor model (v. A)	1334.85	7.165	.965	.061	.049	.822
6 Factor model (v. B)	1325.96	7.143	.966	.060	.048	.835
7 Factor model	1409.90	7.072	.966	.061	.048	.876

Note. We assessed model fit with Akaike Information Criterion (AIC), chi-square tests (CMIN/DF), comparative fit index (CFI), standardized root-mean-square residual (RMSR), root-mean-square error of approximation (RMSEA), and probability of close fit (PCLOSE). Model 6 (version A) combined multiple outcomes and change dimension items into a single factor. Model 6 (version B) combined compromise and resolution dimension items into a single factor. Model 5 combined multiple outcomes or change dimension items, and compromise or resolution items into two respective factors.

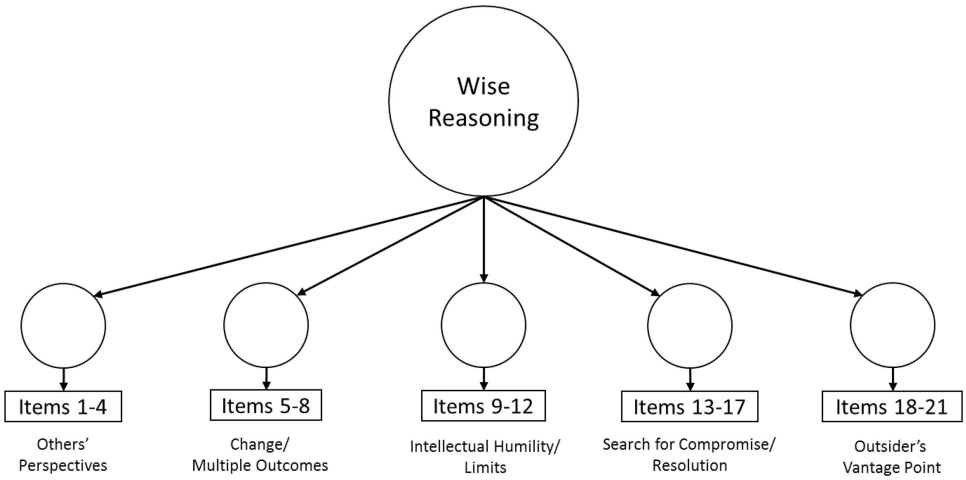

Figure 2. Final five-factor model of the Situated WIse Reasoning Scale.

component as a new index of wise reasoning.[2] Additionally, in several studies we present exploratory tests on individual aspects of wise reasoning.

Interindividual variability. We examined the distribution of wise reasoning across different samples.[3] We found that, in each case, wise reasoning scores exhibited no skewness or kurtosis (both $< |1|$). As seen in Figure 3, we observed a rather symmetric distribution of responses across all samples, indicating substantial interindividual variability and no skewness across both workplace conflicts and conflicts with friends. Consistent with prior research (Grossmann, Gerlach, & Denissen, 2016), people report greater wise reasoning in reflections on interpersonal situations involving a friend compared with work-related disagreements, $t(1549.30)^4 = 5.89$, $p < .001$.

Study 1 Summary

Overall, the SWIS showed a high internal consistency of items and good model fit. Notably, we observed no apparent skewness in the distribution of the wise reasoning scores, meaning that at least with respect to work-related and recent interpersonal conflicts with friends, expression of wise reasoning appears to be normally distributed, which provides initial evidence that the measure avoids biased responding (e.g., no floor or ceiling effects because of social desirability biases). Additionally, we observed substantial cross-situational variability, with greater reports of wisdom in reflections on conflicts involving a friend versus a workmate or a boss.

Study 2: Intra-Individual Stability Versus Variability

Building on the emerging scholarship in personality research on the importance of measuring intraindividual differences, Study 2 aimed to explore intraindividual variability in wise reasoning across multiple sampling points, to estimate trait-level stability and variability in the construct (e.g., Fleeson & Jayawickreme, 2015). In this study, trait-level individual differences are conceptualized as an average across multiple sampling points. Of particular importance here, recent diary work has indicated that the intraindividual variability in wise reasoning is comparable in magnitude to the variability of established personality constructs (Grossmann et al., 2016). This work also suggested that some aspects of wise reasoning (i.e., "self-transcendence") may be more stable across situations than others (i.e., perspective taking). In light of these previous findings, we examined the intraindividual variability in each of the five aspects of wise reasoning utilizing the hybrid method.

We recruited participants ($n = 293$) from the prior studies to fill out a follow-up wise reasoning survey at least 2 years upon completion of the initial survey. We expected that wise reasoning scores would exhibit significant convergence across points in time. However, on the notion that wise reasoning is context-dependent (Grossmann, in press), we expected the relations between wise reasoning at Time 1 and Time 2 would be small-to-medium in magnitude.

Method

Participants, procedure, and measures. Participants were drawn from Samples A–F, instructed to complete the wise reasoning measure, and several additional indices (see Study 6). Sample characteristics are presented in supplementary material Table 13.

Results

We explored the intraindividual stability of wise reasoning and each of its five aspects. We did so by estimating correlations,

[2] Results from all main analyses in this study were replicated when calculating wise reasoning scores by averaging items (Cronbach's $\alpha > .90$ in all samples). Separate PCA scores were computed for Sample A and Sample B individually because they were included in larger scales with other items used for scale creation.

[3] Because different PCA scores were computed in Samples A and B compared with the other samples, we examined average scores of means across items on each of the five aspects of wise reasoning to compare the distribution of wise reasoning across samples.

[4] All degrees of freedom in linear regression analyses are based on Welch-version of the *t* tests, correcting for potential unequal variances.

Table 4
Loadings From a Principal Component Analysis (PCA) of the Five Components of Wise Reasoning on a Second-Order Component

Dimension	Workplace[a]	Interpersonal online[b]	Intergroup[c]	Interpersonal student[d]	North America (conflict 1/conflict 2)[e]	United Kingdom/Europe/other (conflict 1/conflict 2)[e]
Others' perspectives	.81	.82	.82	.75	.81/.82	.83/.81
Change or multiple outcomes	.76	.72	.75	.77	.78/.77	.78/.84
Intellectual humility	.80	.81	.79	.77	.86/.74	.82/.85
Search for compromise or resolution	.84	.82	.86	.80	.76/.84	.84/.87
Outsider's vantage point	.70	.60	.73	.64	.61/.47	.65/.54

Note. Standardized coefficients are presented; a single component solution was used to obtain dimension loadings.
[a] (Samples A and B). [b] (Samples C–F). [c] (Sample E). [d] (Sample G). [e] (Sample J).

based on the variance explained between Wave 1 and Wave 2 data points. Similar to past research (Grossmann et al., 2016), we found moderate positive associations between Wave 1 and Wave 2, r_{SWIS} (n = 290) = .48, $r_{Perspectives}$ (n = 290) = .56, $r_{Multiple\ Outcomes}$ (n = 290) = .48, r_{Limits} (n = 290) = .56, $r_{Compromise/Resolution}$ (n = 290) = .47, $r_{Outsider's\ Viewpoint}$ (n = 290) = .66. We also estimated intraindividual correlations for global wisdom scores, across Wave 1 and Wave 2. Here, we found positive associations between waves, r_{SAWS} (n = 37) = .53, $r_{3D\text{-}WS}$ (n = 41) = .42, and r_{ASTI} (n = 40) = .54, comparable with those observed with SWIS. Notably, the latter estimates are based on underpowered subsamples and should be interpreted with caution.

Study 2 Summary

Study 2 showed initial evidence for the intraindividual stability in wise reasoning. Conceptualizing trait-level individual differences as an average across multiple sampling points, we found positive associations between Wave 1 and Wave 2 wise reasoning and each of its five aspects. The results indicated a somewhat greater association between different measurement points in wise reasoning as compared to that observed in prior work (Grossmann et al., 2016), likely because of a larger number of items and greater internal reliability of the present instrument, compared with the one used in prior research. Given that Wave 1 and Wave 2 assessments were separated by at least 2 years, these findings present a conservative test of the variation-convergence of wise reasoning across different points in time.

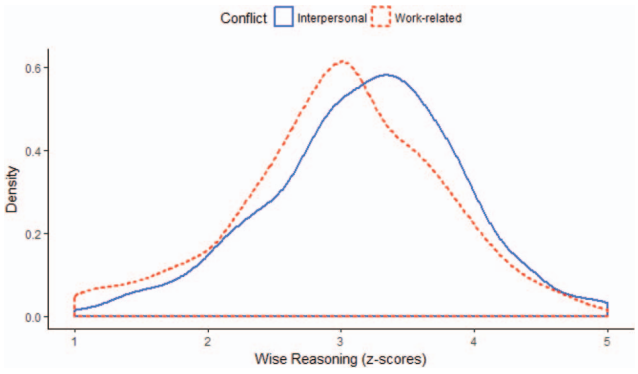

Figure 3. Distribution of wise reasoning across individuals reflecting on interpersonal conflicts involving a friend or in the workplace. See the online article for the color version of this figure.

Study 3: Initial Validity Tests

In Study 3, we report the initial validity tests, specifically aiming to establish preliminary convergent and discriminant validity of the SWIS. First, we established the convergent validity of the state-level measure by comparing state-level wise reasoning scores to scores obtained from global, decontextualized measures and observer-ratings of wise reasoning. We compared people's wise reasoning scores to scores on existing global measures of wisdom: Self-Assessed Wisdom Scale (Webster, 2003), Three-Dimensional Wisdom Scale (Ardelt, 2003), and Adult Self-Transcendence Inventory (Levenson et al., 2005). Further, we explored participants' expression of wise reasoning when reflecting on their challenges and when reflecting on a societal conflict that was heightened at the time (March 20–24, 2014)—the Crimean referendum in Ukraine. Additionally, we examined whether state-level wise reasoning about the societal conflict would correspond to participants' wise reasoning scores as rated by outside observers (Grossmann et al., 2010, 2013). To examine this question, we asked participants to respond to several questions about the societal conflict in Crimea, and their responses were later assessed by trained coders for expression of wise reasoning and compared with the scale responses.

Next, we established discriminant validity by comparing the relations between SWIS scores and measures of bias, in juxtaposition with global wisdom measures. Specifically, we examined whether the SWIS would be less susceptible to biased responding as compared with global self-report measures of wisdom (Glück et al., 2013; Taylor et al., 2011). To distinguish the new measure from extant measures of wisdom, we assessed Sample D participants for biased responding (i.e., impression management and self-deception; Paulhus, 1984, 1988), and compared these responses to scores on wise reasoning and global wisdom measures. Further, because at the conceptual level wisdom promotes unbiased thinking and judgment, we included measures of sociocognitive bias, namely bias blind spot (i.e., the tendency to attribute greater psychological bias to others than to the self; Pronin, 2008) and dispositional and situational bias in attributions of others' behavior (Grossmann & Varnum, 2011; Kitayama, Ishii, Imada, Takemura, & Ramaswamy, 2006). Finally, to control for the possibility that the bias-related differences between global and

state-level measures are because of different item content, we created a global, decontextualized version of the SWIS, adapting items from the state-level measure to refer to general tendencies, testing its relation with biased responding.

We expected small-to-moderate relations between scores from SWIS and global wisdom scales. Further, to the extent that the hybrid method captures variance of wisdom-related cognition more accurately, we expected that its scores would be less prone to (i.e., less related to) psychological bias compared with scores obtained from the global wisdom scales.

Method

Samples. Participants in Study 3 were drawn from Samples D, E, and H. In Samples D and E, participants completed the state-level wise reasoning measure and a subset of the validation measures (see Table 5).

Table 5
Descriptives and Reliability of Nomological Network Measures

Constructs	Sample (*n*)	Items	*M*	*SD*	Reliability (α/κ)
Global self-assessment of wisdom					
SAWS	D (238)	40	4.58	.61	.91
3DWS	D (240)	39	3.28	.47	.87
ASTI	D (240)	10	3.67	.69	.80
Global wise reasoning	H (501)	13	4.36	.68	.89
Intergroup wise reasoning (z-scores)	E (240)	21	—	—	.93
Observer-rated wise reasoning	E (202)	3	.07	1.08	.71–.79$^{\kappa}$
Bias-related indicators					
Socially desirable responding					
Self-deception	D (730)	20	.12	.11	.71
	H (497)	5	.19	.26	.75
Impression management	D (698)	20	.12	.11	.76
	H (497)	3[a]	.09	.19	.66
Bias blindspot	D (705)	1	1.42	1.81	—
Biased (vs. balanced) attributions	D (708)	8	−.57	.33	.60
Individual differences					
Big-Five personality					
Openness	B1 (220)	8	3.72	.64	.82
Conscientiousness	B1 (220)	8	3.88	.69	.85
Extraversion	B1 (220)	8	3.14	.91	.83
Agreeableness	B1 (220)	8	3.8	.70	.83
Neuroticism	B1 (220)	8	2.63	.83	.85
Intellect		24			
Seek	B2 (220)	12	5.39	1.06	.95
Conquer	B2 (217)	12	5.00	1.15	.96
Attributional complexity	B1 (218)	28	4.69	.87	.92
Perspective taking	A (404)	7	3.41	.73	.80
Emotional intelligence		12			
Self-emotions appraisal	D (702)	4	5.21	1.20	.90
Others-emotions appraisal	D (701)	4	5.2	1.10	.89
Use of emotion	D (701)	4	5.22	1.26	.88
Regulation of emotion	D (701)	4	4.83	1.38	.90
Mindfulness		39			
Nonreactivity	B2 (223)	7	3.27	.75	.87
Observing and attending	B2 (223)	8	3.54	.75	.87
Acting with awareness	B2 (223)	8	3.30	.88	.92
Describing with words	B2 (221)	8	3.39	.75	.85
Nonjudging of experience	B2 (220)	8	3.04	.96	.93
Communal relationship orientation	A (404)	14	2.52	.79	.88
Emotion regulation		10			
Reappraisal	B2 (216)	6	4.88	1.22	.93
Suppression	B2 (216)	4	4.29	1.38	.85
Ruminative response		10			
Reflection	D (701)	5	2.59	.68	.77
Brooding	D (701)	5	2.54	.77	.82
Social relations growth mindset					
Interpersonal relations are changeable	G (466)	3	4.75	1.07	.79
Social conflicts are changeable	G (466)	3	5.28	.92	.85

Note. *n* = number of observations. Sample B participants responded to one half of the individual differences measures (i.e., B1 or B2). No reliability is reported for bias blindspot, which is a single score. κ = Cohen's kappa scores for coded dimensions; SAWS = Self-Assessed Wisdom Scale; TDWS = Three-Dimensional Wisdom Scale; ASTI = Adult Self-Transcendence Inventory.
[a] Two impression management items were dropped because of poor reliability (α = .44).

Sample H participants completed the alternative, global (i.e., decontextualized) measure of wise reasoning. Reliability indices and descriptive information for each measure are presented in Table 5.

Measures.

Convergent validity. For tests of convergent validity, we included three global measures of wisdom. We also included an adapted SWIS that focused on intergroup conflicts, and individuals' scores of observer-rated wise reasoning performance in terms of text responses to the same intergroup conflict.

Self-Assessed Wisdom Scale (SAWS). The SAWS (Webster, 2003) is a 40-item measure assessing multiple wisdom dimensions: Experience (e.g., "I have overcome many painful events in my life"), emotional regulation (e.g., "I am "tuned" into my own emotions"), reminiscence/reflection (e.g., Recalling my earlier days helps me gain insight into important life matters"), Humor (e.g., "Now I find that I can really appreciate life's little ironies"), and Openness (e.g., "I like being around persons whose views are strongly different from mine"). Statements are assessed on 6-point scales (1 = *strongly disagree* to 6 = *strongly agree*). Scores are determined by summing all items to form a total wisdom score.

Three-Dimensional Wisdom Scale (3D-WS). The 3D-WS (Ardelt, 2003) is a 39-item measure that assesses wisdom as a composite of cognitive (e.g., "I always try to look at all sides of a problem"), reflective (e.g., "When I look back on what's happened to me, I feel cheated"), and affective dimensions (e.g., "I either get very angry or depressed if things go wrong"). Statements are assessed on 5-point scales (1 = *strongly agree* to 5 = *strongly disagree* or 1 = *definitely true of myself* to 5 = *not true of myself*). Scores are determined by computing the mean of each of the three dimensions and taking the mean of these three-dimensional scores.

Adult Self-Transcendence Inventory (ASTI). The ASTI (Levenson et al., 2005) assesses wisdom as the development of self-transcendence, using 10 items. This scale asks participants to rate themselves as they are now, compared with 5 years ago (e.g., "I am more likely to engage in quiet contemplation"). Statements are assessed on 4-point scales (1 = *disagree strongly* to 4 = *agree strongly*). Scores are determined by summing items.

Observer-rated wise reasoning performance. To evaluate the accuracy of self-reports in the new state-level method, Sample E (N = 240) participants provided written reflections on a recent societal conflict, which were rated by independent observers (as in Grossmann et al., 2010). Participants were surveyed following the Crimea referendum in Eastern Europe (March 20–24, 2014). We compiled a summary of the ongoing sociopolitical conflict in the Ukraine (see supplementary material Table 15 for exact wording). After reading the summary, participants were asked to provide their thoughts about the conflict, guided by three questions in the following order: "How do you think the situation in Ukraine might unfold?", "Why do you think the issue in Ukraine might unfold in the way you just wrote?", and "What do you think should be done in the situation in Ukraine?" (Grossmann et al., 2010, 2013).

Following established procedures, two trained, hypothesis-blind raters content-analyzed participants' narrative reflections on five aspects of wisdom-related thought: recognition of the limits of one's own knowledge, recognition of uncertainty and change, recognition of others' perspectives, consideration of/search for compromise, and importance of conflict resolution (Grossmann et al., 2010; Grossmann & Kross, 2014; Grossmann et al., 2013; Kross & Grossmann, 2012). In line with how observer ratings were conducted in prior scholarship (Grossmann et al., 2010), compromise and resolution were coded separately. Recognition of multiple ways a situation may unfold and recognition of change, previously coded as two separate components (Grossmann et al., 2010, 2012; 2013), were collapsed into one dimension of recognition of uncertainty and change, as done in subsequent research (Grossmann et al., 2016; Kross & Grossmann, 2012). Further, given that participants were not involved in the conflict (i.e., default third person perspective), we did not code responses for the application of an outsider's viewpoint. Raters used a scale from 0 (*not at all*) to 2 (*a great deal*). Interrater reliabilities for each aspect were in the medium-high range (see Table 5). Following prior research (Grossmann et al., 2010), the aspects of wisdom-related thought were subjected to a principal component analysis, which yielded a single component solution, with the resulting score used as a metric of observer-rated scores of wise reasoning.

Wise reasoning about an intergroup conflict. Upon reading the Ukraine conflict summary and writing down their thoughts about the conflict, participants completed the set of 21 wise reasoning items. Instructions asked participants to indicate the extent to which they engaged in wise reasoning as they were thinking and writing down their open-text responses about the intergroup conflict, with all other aspects being identical to the measure for interpersonal conflicts (supplementary material Table 16). Similar to the internal reliability of the interpersonal wise reasoning instrument, reliability of the adapted measure of wise reasoning about intergroup conflicts was very high.

Global wise reasoning scale. We adapted two items from each of the initial seven dimensions of the wise reasoning measure to refer to global self-ratings (e.g., "I keep an eye out for ways things might change over time"). Statements were assessed on 6-point scales (1 = *strongly disagree* to 6 = *strongly agree*). Principal component analysis, using Promax rotation and eigenvalues >1, on all 14 items indicated that one item (item 7), initially designed to be a reverse-coded item, did not covary well with the other items; further, scale reliability analysis indicated that for this item the corrected item-total r = .17). Therefore, we discarded this item, which resulted in a highly reliable 13-item scale (supplementary material Table 17).

Discriminant validity. To distinguish the SWIS at the psychometric level, we tested its relation to measures of biased responding, in juxtaposition with extant self-report measures of wisdom. To distinguish wise reasoning from bias at the conceptual level, we tested its relations with social–cognitive biases—bias blind spot and attribution bias—again in juxtaposition with global wisdom scores.

Biased responding. We used the 20-item Self-Deception and 20-item Impression Management subscales of the BIDR (Paulhus, 1984, 1988). Self-Deception assesses overconfidence in oneself (e.g., "I never regret my decisions"), and Impression Management assesses the tendency to overreport desirable and underreport undesirable behavior (e.g., "I never cover up my mistakes"). Statements were assessed on 7-point scales (1 = *strongly disagree* to 7 = *strongly agree*). A score of 1 is assigned for each item for which the participant scores an extreme score (i.e., 6 or 7), and a score of 0 for each item that is scored otherwise. Following

Paulhus (1984, 1988), item scores for each subscale were summed, resulting in a total range from 0 (low desirable responding) to 20 (high desirable responding). Sample D participants completed the full 20-item self-deceptive positivity and impression management items. Sample H participants completed a brief version of this measure, including five impression management items and five self-deception items. To form the measures used in Sample H, we selected items based on scale reliability tests for each subscale on Sample D responses (i.e., we took the five highest loading items from each dimension).

Bias blind spot. Using a paradigm developed by Pronin et al. (2002), participants read a description of the "self-serving bias" and were asked about their own susceptibility to this bias (i.e., "To what extent do you believe that you show this effect or tendency?") and about the susceptibility of the average American to this bias (i.e., "To what extent do you believe the average American shows this effect or tendency?"), on 9-point scales (1 = *not at all* to 9 = *strongly*). Presentation order was counterbalanced. Scores were computed by calculating a difference score between participants' ratings of their susceptibility versus others' susceptibility to the self-serving bias. Higher scores represent greater bias blind spot.

Biased (vs. balanced) attributions. Participants read four vignettes that depict an individual who performed either a desirable or an undesirable action under some extenuating context (supplementary material Table 18; Grossmann & Varnum, 2011; Kitayama, Ishii, Imada, Takemura, & Ramaswamy, 2006). After reading each vignette, participants answered two questions indicating (a) the extent to which features of the individual, such as his or her character, attitude, or temperament, influenced the individuals' behavior (dispositional attribution); and (b) the extent to which features of the environment that surround the individual, such as atmosphere, social norms, or other contextual factors, influenced the individuals' behavior (situational attribution; 1 = *strongly disagree*, 6 = *strongly agree*). Vignette and question presentation order were counterbalanced. For each vignette, a "biased attribution" score was assigned a score of 1 if participants reported only dispositional or situational factors as influential to the individuals' behavior; otherwise, we assigned a score of 0. We calculated a composite index of biased attribution by averaging the scores from the four vignettes.

Results

Convergent validity.

Global wisdom measures. Findings from Study 2 are presented in Table 6. We first examined the relationships between scores on the wise reasoning (interpersonal conflicts) measure and the three global measures of wisdom. We observed a small-to-medium positive association between SWIS scores and indices of global self-assessed wisdom, $.19 \leq rs \leq .39$, suggesting that the SWIS is related to but distinct from existing global measures of wisdom.

Wise reasoning performance. We also found that self-reported wise reasoning about the intergroup conflict was positively associated with observer-rated wise reasoning performance about the intergroup conflict, $B = .19$, $t(200) = 2.67$, $p = .008$. This association is comparable in magnitude to the degree of convergence of self- and observer-ratings on other established individual difference constructs (Meyer et al., 2001). Moreover, participants reporting higher state-level wisdom in interpersonal conflicts were also more likely to report higher state-level wisdom in the domain of intergroup conflict, $r = .44$, $p < .001$. The convergence across methods of assessments and domains is noteworthy and suggests that people's wise reasoning strategies may generalize across domains.

Discriminant validity.

Biased responding. Next, we tested whether the state-level and global measures of wisdom predict biased responding. Replicating past findings (Glück et al., 2013; Taylor et al., 2011), global wisdom measures were associated with biased responding, self-deception: $.17 \leq rs \leq .36$, $ps < .001$, impression management: $.22 \leq rs \leq .40$. In contrast, SWIS scores were negligibly related to biased responding, $-.05 \leq rs \leq .07$, establishing evidence that the state-level measure of wise reasoning is largely independent of biased responding. Similar to established global measures of wisdom, the global measure of wise reasoning (comprised of de-

Table 6
Pearson's Correlation Between Wise Reasoning (and Its Five Aspects), Global Measures of Wisdom, and Bias-Related Indicators

Constructs	SWIS	Perspective	Change	Humility	Compromise	Outsider viewpoint	SAWS	3D-WS	ASTI	Global wise reasoning
Global self-rated wisdom										
SAWS	.39***	.26***	.30***	.35***	.36***	.28***				
3D-WS	.21***	.17**	.14*	.15**	.26***	.01				
ASTI	.19**	.22***	.17***	.03	.16**	.13*				
Observer-rated wisdom[a]	.19**	.18*	.27**	.11	.29**	.05				
Bias-related indicators										
Social desirability										
Self-deception	−.05	−.03	.02	−.07*	−.01	−.09*	.17**	.36***	.23***	.17***
Impression management	.07*	−.03	.05	.04	.13***	.02	.22***	.40***	.24***	.30***
Bias blindspot	<.01	.03	−.01	−.05	.02	−.01	.25***	.18**	.19**	—
Biased (vs. balanced) attributions	−.11**	−.09*	−.08*	−.04	−.11**	−.10**	−.13*	−.04	−.02	—

Note. SWIS = Situated WIse Reasoning Scale; SAWS = Self-Assessed Wisdom Scale; 3D-WS = Three-Dimensional Wisdom Scale; ASTI = Adult Self-Transcendence Inventory. The sample with the Global Measure of Wise Reasoning did not have items for bias blindspot and biased attributions.
[a] Unstandardized estimates from a linear regression with wise reasoning (and its five aspects) predicting observer-rated wisdom are reported.
* $p \leq .05$. ** $p \leq .01$. *** $p \leq .001$.

contextualized items similar to those in the state-level measure) was subject to self-deception, $r = .17$, $p < .001$, and impression management, $r = .30$, $p < .001$. The latter finding suggests that it is not the idiosyncratic nature of the items, but rather the focus on concrete situations and use of event reconstruction that contributes to less bias in the SWIS.

Social biases. Finally, we compared the relationships between each of the SWIS and three global measures of wisdom with social biases. As Table 6 indicates, global scores of wisdom were associated with a greater bias blind spot, $.18 \leq rs \leq .25$, whereas state-level scores of wise reasoning were not, $r < .01$. Furthermore, participants scoring higher on the SWIS were less likely to make biased (vs. balanced) attributions, $r = -.11$, $p = .003$, as were participants scoring higher on one global wisdom scale, SAWS: $r = -.13$, $p = .04$, with other global scales showing no significant relationship to attributional judgments, $rs < |.05|$.

To investigate further, we compared the relations between the SWIS versus the SAWS to biased attributions. The size of the association between state-level wise reasoning and biased attribution was comparable when controlling for SAWS, $r = -.12$, $p = .08$ (note that the relation between wise reasoning and biased attributions controlling [vs. not controlling] for SAWS scores size remains the same but the p value increases because of smaller subsample containing both SAWS and wise reasoning data). In contrast, the reverse was not true—the relationship between SAWS and biased attribution was no longer significant when controlling for SWIS, $r = -.08$, $p = .24$. Also, state-level wise reasoning was associated with less biased attributions, even when controlling for individual differences included in Sample D, all of which speaks to the incremental validity of the SWIS over existing global self-report wisdom measures.[5] Supplementary analyses of the relationships between each aspect of state-level wise reasoning and the outcomes from Study 3 are also presented in Table 6, and show that the relationship between wise reasoning and the outcomes was not exclusive to one particular aspect but is rather present across each aspect of wise reasoning.

Study 3 Summary

Altogether, Study 3 showed that SWIS scores showed good convergent validity, with consistent relations with extant global wisdom scores and observer-rated wisdom scores, as well as wise reasoning about intergroup conflicts. Further, Study 2 also showed that the SWIS showed excellent discriminant validity. In contrast to extant global wisdom measures, the new state-level measure was independent of biased responding and social–cognitive biases.

Study 4: Extending the Nomological Network of State-Level Wise Reasoning

According to psychological theorizing on wisdom (Baltes & Smith, 2008; Erikson, 1984; Grossmann et al., 2013; Kekes, 1995; Ryff & Heincke, 1983; Ryff & Keyes, 1995; Staudinger & Glück, 2011; Sternberg, 1998; Tiberius, 2008; Weststrate & Glück, in press), the wise individual ought to be balanced in thinking, judgment, and action, skilled at emotion regulation and intelligence, and oriented to collective well-being (vs. being predominantly self-serving).

Does wise reasoning relate to such tendencies? The purpose of Study 4 was to address this question by extending the nomological network (Cronbach & Meehl, 1955) of the SWIS. We hypothesized that state-level wise reasoning would be positively associated with such constructs (Baltes & Staudinger, 2000; Kunzmann & Baltes, 2003; Tiberius, 2008), without fully overlapping with them (Grossmann et al., 2013; Staudinger & Glück, 2011; Staudinger et al., 1997). Mindfulness, openness, emotional intelligence, and attributional complexity have been shown to lead to positive social–cognitive outcomes (Fletcher, Danilovics, Fernandez, Peterson, & Reeder, 1986; Goldstein & Gigerenzer, 2002; Kabat-Zinn, 2000; Law, Wong, & Song, 2004; Wong & Law, 2002; see Table 6) that are also associated with wisdom (Baltes & Smith, 2008; Dambrun & Ricard, 2011; Garland, Farb, Goldin, & Fredrickson, 2015; Grossmann et al., 2013; Staudinger & Glück, 2011; Sternberg, 1998). Therefore, we selected these measures as part of our nomological network assessment. Most psychological perspectives suggest that wisdom involves recognition and management of uncertainties in life (Baltes & Smith, 2008; Basseches, 1980, 1984; Grossmann et al., 2010; Staudinger & Glück, 2011; for a review, see Grossmann, 2017), hence also we expected our wise reasoning scores to be associated with changeable (or incremental) beliefs about conflicts and social life in general. Measures such as emotion suppression, neuroticism, and rumination were selected because of the large body of research indicating that they lead to negative outcomes (Gross & John, 2003; Treynor, Gonzalez, & Nolen-Hoeksema, 2003). Therefore, we expected negative or null relationships between these constructs and wise reasoning. Finally, based on the notion that wisdom-related qualities are associated with an orientation to others' concerns, we included measures of social orientation, such as communal relationship orientation, dispositional perspective-taking, agreeableness, and attending to others' emotions, expecting that wise reasoning would relate to a greater orientation toward collective well-being. We had no a priori expectation for the relationship between wise reasoning, extraversion, and conscientiousness, but assessed these along with the other Big Five constructs.

Method

Participants. Participants in Samples A, B, D, and G completed the SWIS and a subset of individual difference measures.

Measures. Table 5 indicates general information regarding each measure (sample inclusion and number of items) and descriptive statistics.

Big Five personality traits. We used John, Naumann, and Soto's (2008) Big Five Inventory to assess personality. Participants indicated the extent to which they agreed with 44 statements about themselves, assessing openness to experience (e.g., "Is curious about many different things"), Conscientiousness (e.g., "Does a thorough job"), Extraversion (e.g., "Has an assertive personality"), Agreeableness (e.g., "Is helpful and unselfish with

[5] We also tested the relationship between state-focused wise reasoning scores and individual attribution scores (situational vs. dispositional) for each vignette. Wise reasoning scores interacted with attribution score on vignette 1 (see Appendix E for vignette items), $B = 0.23$, $t(1409) = 3.16$, $p = .002$, and on vignette 3, $B = 0.14$, $t(1410) = 1.93$, $p = .05$, such that people with higher wise reasoning scores tended to endorse situational attributions more than people with lower wise reasoning scores ($r_{\text{vignette1}} = .14$, $p_{\text{vignette1}} < .001$, $r_{\text{vignette3}} = .10$, $p_{\text{vignette3}} < .006$). This effect did not reach significance for vignette 2 or vignette 4.

others"), and Neuroticism (e.g., "Can be moody") on 5-point scales (1 = *disagree strongly*, 5 = *agree strongly*). Scores were calculated by averaging the items.

Intellect. We used Mussel's (2013) 24-item scale assessing two motivational dimensions of intellect: *seek* and *conquer*. The seek dimension includes 12 items referring to openness and positivity toward situations that are intellectually challenging (e.g., "I would like to learn new ways of doing things"). The conquer dimension includes 12 items assessing how one is motivated to resolve situational incongruities and master intellectual challenges, once they arise (e.g., "I am able to think about things in a lengthy, focused way"). All statements were assessed on 7-point scales (1 = *strongly disagree*, 7 = *strongly agree*). Scores were calculated by averaging respective items.

Attributional complexity. Fletcher and colleagues' (1986) measure of attributional complexity assesses the degree to which individuals are motivated to uncover more or less in-depth information about social events. Participants were asked to rate the extent to which they agreed with 28 statements (e.g., "I think very little about the different ways that people influence one another") on 7-point scales (1 = *disagree strongly*, 7 = *agree strongly*). Scores were calculated by averaging the items.

Perspective taking. We used the perspective taking dimension of Davis' (1983) Empathy Questionnaire. Participants rated the degree to which nine statements describe them (e.g., "I try to look at everybody's side of an agreement before I make a decision") on a 5-point Likert-type scale (1 = *does not describe me well*, 5 = *describes me very well*).

Emotional intelligence. We used Wong and Law's (2002) 16-item Emotional Intelligence Scale measuring four dimensions of emotional intelligence: self-emotions appraisal (e.g., "I really understand what I feel"), others-emotions appraisal (e.g., "I have good understanding of the emotions of people around me"), use of emotion (e.g., "I would always encourage myself to try my best"), and regulation of emotion (e.g., "I can always calm down quickly when I am very angry"). All statements were assessed on 7-point scales (1 = *totally disagree* to 7 = *totally agree*). Scores were calculated by averaging the items for each dimension.

Mindfulness. We used Baer and colleagues' (2006) 39-item Five Factor Mindfulness Questionnaire, which measures nonreactivity to inner experience (e.g., "In difficult situations, I can pause without immediately reacting"), observing/attending (e.g., "I pay attention to how my emotions affect my thoughts and behavior"), acting with awareness (e.g., "I find myself doing things without paying attention"), describing/labeling with words (e.g., "I'm good at finding the words to describe my feelings"), and nonjudging of experience (e.g., "I criticize myself for having irrational or inappropriate emotions"). Participants responded to statements on 5-point scales (1 = *never or very rarely true*, 5 = *very often or always true*). Scores were calculated by averaging respective items.

Communal relationship orientation. Clark, Oullette, Powell, and Milberg's (1987) scale was used. Participants responded to how characteristic of them each of 10 statements is (e.g., "I'm not especially sensitive to other people's feelings"), on a 5-point scale (1 = *extremely characteristic of me*, 5 = *extremely uncharacteristic of me*). Communal relationship orientation scores were calculated by recoding (such that higher values mean greater communal orientation) and averaging the items.

Emotion regulation. Gross and John's (Gross & John, 2003) 10-item Emotion Regulation Questionnaire assesses two dimensions of emotional regulation. The first dimension, *reappraisal*, includes six statements assessing the extent to which individuals control their emotions by changing the way they think about situations (e.g., "When I want to feel more positive emotion, I change the way I'm thinking about the situation"). The second dimension, *suppression*, includes four statements assessing how individuals withhold expressing their emotions as a way of dealing with them (e.g., "I control my emotions by not expressing them"). All statements were assessed on 7-point scales (1 = *strongly disagree*, 7 = *strongly agree*). Scores were calculated by averaging the items.

Rumination. We used Nolen-Hoeksema and Morrow's (1991) 10-item Ruminative Responses Scale that assesses two dimensions of rumination: reflection (e.g., "Go someplace alone to think about your feelings") and brooding (e.g., "Think: What am I doing to deserve this?"). Each dimension was assessed with 5 items on 4-point scales (1 = *almost never* to 4 = *almost always*). Scores were calculated by averaging respective items.

Growth mindset about social relations. We measured peoples' growth (i.e., incremental) versus fixed (i.e., entity) mindset of social relations. We asked participants the extent to which they agree with three statements regarding a growth mindset of *interpersonal relations* (e.g., "People can always change their own interpersonal ability"; Hui, Bond, & Molden, 2012). We adapted extant items to create the second measure that used three statements to measure a growth mindset of *social conflict* (e.g., "The degree of conflict between people can change over time"). Participants replied to these statements on 7-point scales (1 = *strongly disagree*, 7 = *strongly agree*). Scores were calculated by averaging the items.

Results

Results are presented in Table 7. State-level wise reasoning was significantly associated with open-minded beliefs and cognitive styles, including growth mindset about social relations, intellect, attributional complexity, and openness. SWIS scores were further associated with greater social orientation, as measured by perspective-taking, agreeableness, extraversion, and communal relationship orientation. Finally, SWIS scores were related to individual differences related to aspects of emotion regulation, three subscales of mindfulness (nonreactivity, observing and attending, describing with words), and self-reported emotional intelligence (self- and others-emotions appraisal, use of emotions, and regulation of emotions). Although maladaptive brooding was positively correlated to SWIS scores, brooding normally shares variance with adaptive reflection (Treynor et al., 2003). When controlling for reflection, the relationship of SWIS to brooding became negligible, $r = .06$, $p = .10$. In contrast, SWIS still showed a small-moderate positive association to reflection scores when controlling for brooding, $r = .23$, $p < .001$. These results suggest that wise reasoning is more closely related to adaptive reflection rather than maladaptive brooding. Associations with other individual differences did not reach statistical significance. In each sample, all individual differences together accounted for less than 25% of the variance in wise reasoning, indicating that wise reasoning is not

Table 7
Pearson's Correlations Between Wise Reasoning (and Its Five Aspects) and Individual Difference Measures

Constructs	SWIS Index	Component of Wise Reasoning				
		Perspective	Change	Humility	Compromise	Outsider
Big-Five personality						
Openness	.19**	.08	.20**	.15*	.16*	.13†
Conscientiousness	.02	−.07	.08	.05	.12†	−.13†
Extraversion	.24***	.14*	.21***	.19***	.14*	.22***
Agreeableness	.12†	.04	.21***	<.01	.19**	<.01
Neuroticism	−.10	−.09	−.10	−.12†	−.11	.05
Intellect						
Seek	.23***	.17**	.23***	.13*	.20**	.16*
Conquer	.24***	.22***	.22***	.16*	.16*	.20**
Attributional complexity	.22***	.10	.16*	.21***	.18**	.18**
Perspective taking	.48***	.39***	.38***	.31***	.48***	.37***
Emotional intelligence						
Self-emotions appraisal	.10**	.07†	.12**	.05	.11**	<.01
Others-emotions appraisal	.21***	.19***	.13***	.09*	.23***	.13***
Use of emotion	.11**	.04	.11**	.05	.13***	.07†
Regulation of emotion	.12***	.11**	.09*	.08*	.11**	.07†
Mindfulness						
Nonreactivity	.19**	.17**	.16*	.16*	.18**	.07
Observing and attending	.42***	.38***	.36***	.32***	.34***	.27***
Acting with awareness	−.12†	−.13†	−.03	−.09	−.04	−.20**
Describing with words	.17**	.14*	.21***	.11	.11	.08
Nonjudging of experience	−.11	−.10	−.11	−.07	.01	−.18**
Communal relationship orientation	.24***	.20***	.22***	.18***	.23***	.14**
Emotion regulation						
Reappraisal	.23***	.20**	.24***	.17*	.21***	.10
Suppression	.05	.11	.02	.11	.02	−.06
Ruminative response						
Reflection	.26***	.21***	.15***	.21***	.19***	.22***
Brooding	.13***	.08*	.07*	.12**	.07†	.19***
Social relations growth mindset						
Interpersonal relationship are changeable	.16***	.11*	.15***	.19***	.11*	.03
Social conflicts are changeable	.15***	.08†	.20***	.16***	.11*	<.01

Note. SWIS = Situated WIse Reasoning Scale.
† $p \leq .08$. * $p \leq .05$. ** $p \leq .01$. *** $p \leq .001$.

fully accounted for by existing individual difference measures.[6] Some prior research has investigated perspective-taking, and its positive relations to important psychological and social outcomes (e.g., prosociality; Underwood & Moore, 1982). Therefore, we additionally explored the relations between each aspect of wise reasoning and individual differences, finding similar results across each aspect (see Table 7). Finally, we conducted tests of the incremental validity of wise reasoning, controlling for the variance explained by perspective taking aspect of wise reasoning. Here, we found that the pattern of results was similar, albeit with a slightly smaller magnitude of association in a few cases (see SOM for full results).

Study 4 Summary

Taken together, Study 4 findings confirm theory arguing that wisdom is related to adaptive psycho-social functioning (cf. Wink & Staudinger, 2015), dovetailing with burgeoning bodies of research on interpersonal relations (Van Lange et al., 2013), and well-being (Diener, Kanazawa, Suh, & Oishi, 2015; Diener & Tay, 2014; Fredrickson, 2006a; Gross, 1998). Higher SWIS scores were related to balanced thinking and attention, adaptive emotional functioning, and a more social orientation.

Study 5: Cooperative Balancing of Self- Versus Other-Focused Intentions

In Study 5, we further probed the relationship between wise reasoning and social orientation (Staudinger & Glück, 2011; Sternberg, 1998), extending it beyond global individual differences in cooperation to concrete cooperative (vs. self-focused) behaviors and cooperative tendencies in social dilemma tasks that capture managing conflicting (self- vs. other-focused) interests. By examining these outcomes, we started addressing one of the key criteria postulated by various wisdom theorists—the notion of balance between different interpersonal interests (Grossmann, 2017;

[6] We examined the relationships between wise reasoning and individual differences, controlling for global trait-level wisdom measures (Sample D responses: emotion regulation and emotional intelligence). Each participant completed only one global wisdom measure, so we controlled for each separately. Controlling for the global wisdom scores, we found that wise reasoning was still positively related to adaptive reflection, $.15 < rs < .31$. Controlling for SAWS, wise reasoning was not significantly related to emotional intelligence. Controlling for 3D-WS, wise reasoning was related to emotional intelligence, specifically the "use of emotion" dimension, $r = .15$. Controlling for ASTI, wise reasoning was related to emotional intelligence, specifically the "others' emotions" dimension, $r = 21$.

Staudinger & Glück, 2011; Sternberg, 1998). The idea of balancing self-protective and cooperative intentions is central to interpersonal conflicts and can be simulated in the lab via social dilemma games (e.g., prisoner's and commons dilemmas). In social dilemma games, losses are incurred upon cooperative players (those focused on mutual gains), when paired with competitive players (those focused on self-gains), who gain from defecting on cooperators. A choice to defect here reflects a myopic concern about maximizing benefits for self, which neglects benefits for the partner player(s). As such, even those with intuitively cooperative goals may cede their goals and orient themselves toward protecting their self-interests (Kelley & Stahelski, 1970). In contrast, take the benefits for the partner into consideration can help to sustain a balance between self- and other-interest, yielding mutually beneficial outcomes (also called joint gain; Axelrod & Hamilton, 1981). This insight is consistent with theorizing in wisdom scholarship, which suggests that the wise participant is better able to balance such dichotomies (e.g., self vs. others; Staudinger & Glück, 2011).

To the extent that wise reasoning affords a bigger-picture, more integrative perspective, then we expected that wise reasoning would relate to increased prosociality (Grossmann, Brienza, & Bobocel, 2017; Sternberg, 1998), both in classic economic dilemmas and in individuals' behavior in their own conflict experiences.

Method

Participants and procedure. Participants from Sample C completed two of the most common social dilemma games used to study cooperative versus self-protective responding (Axelrod, 2006; Rand & Nowak, 2013; Van Lange, Joireman, Parks, & Van Dijk, 2013): the prisoner's dilemma and the commons dilemma. Participants from Samples A–F reported the behaviors they engaged in within their conflicts.

Social dilemma tasks. Sample C participants first responded to the SWIS and a filler task, to minimize the potential influence of the wise reasoning measure on the responses in the social dilemma tasks. Next, a set of participants ($n = 379$) was randomly assigned to complete one of the social dilemmas—prisoner's dilemma (PD) or commons dilemma (CD). Another set of participants ($n = 109$) completed both the PD and CD. The tasks (PD, CD, or both) were counterbalanced in presentation order for participants who completed both tasks. Given that participants did not receive a performance-contingent reward for their participation in these tasks, we characterize responses as generalized cooperative intentions (i.e., cooperative intentions that are not related specifically to kinship, reciprocity, reputation, or threat of punishment; for reviews, see Fehr & Fischbacher, 2003; Jordan, Peysakhovich, & Rand, 2014).

Prosocial and self-protective behaviors. Next, we tested the relationship between wise reasoning and people's behavior within their social conflicts. Participants reported behaviors they enacted in response to the interpersonal conflict they reflected on in response to the wise reasoning measure. Some of these conflict-behaviors could help to resolve the situation to the benefit of both people in the conflict (e.g., trying to solve the problem together, seeking impartial mediator), whereas others could protect oneself at the expense of the other person (e.g., build alliances against the other person; Rahim & Magner, 1995). Participants in Samples B–D and F completed the wise reasoning measure and a set of items capturing conflict-related behaviors. To ensure that the relationship between wise reasoning and reported conflict-related behaviors was not a result of having completed the wise reasoning measure before the conflict-related behavior items (e.g., artifacts, demand effects), presentation order was reversed in Sample F.

Measures.

Social dilemma tasks. We implemented two social dilemma tasks: the fisherman's dilemma, which is a variant of the prisoner's dilemma that is less known among MTurk participants, and the commons dilemma. We sought to avoid competitive framing effects on game outcomes (Kay & Ross, 2003) and to make the tasks more ecologically relevant by altering the tasks from their typical presentation (see below).

Prisoner's dilemma. To avoid potential negative effects of competitive framing and to make the task more ecologically relevant, we framed the prisoner's dilemma game as a fisherman's dilemma, maintaining the reward structure of the prisoner's dilemma (Rapoport & Guyer, 1967). In the prisoner's dilemma, dyadic gains/interests are always maximized when both players cooperate. However, either player can capitalize on their partner's cooperation by defecting, which increases self-gains and partner's losses. This threat can evoke self-protective behavior—preemptively defecting in case the other player takes advantage of one's cooperation. Players were asked to envision themselves harvesting fish in collective waters with other players, and decide whether to capitalize on resources (i.e., to trawl/defect; coded = 0), or to leave the collective resources intact for the group (i.e., to take a sustainable harvest/cooperate; coded = 1).

Commons dilemma. In the commons dilemma (van Dijk & De Cremer, 2006; Van Lange et al., 2013), group gains/interests are always maximized by leaving resources intact. However, any player can take resources for the self, leaving other group members without resources. This threat can evoke self-protective behavior—preemptively taking resources in case another player leaves nothing for the group. This task was altered to make it distinct from a typical group task (e.g., a public goods game). Participants were told that there are 400 chips in a collective pot and that they and other players will take turns choosing whether to take chips for themselves or leave chips for the collective. The chips that were left in the pot after each player had taken their turn would be doubled and split among the group members; thus, furthering collective gains. Participants, who were always the first player, were requested to select a number of chips they would allocate to themselves (0–400).

Prosocial and antisocial behaviors. Based on research on conflict resolution (De Dreu, Evers, Beersma, Kluwer, & Nauta, 2001; Deutsch, Coleman, & Marcus, 2011; Rahim & Magner, 1995) we created items assessing the conflict-related behaviors participants reported within their conflicts. Participants indicated whether they engaged (*Yes/No*) in one of the seven strategies concerning their thinking, feeling, and behaving during the conflict, including four prosocial strategies: "I tried to find another person to hear both sides of the story"; "I tried to find somebody to give me impartial advice"; "I tried to communicate with the other person to try to solve the problem together"; "I forgave the other person", and three antisocial strategies: "Tried to just disengage from the other person and/or the situation"; "Retaliated

against the other person"; "Tried to find an ally against the other person, indicating whether they engaged the behavior".

Results

First, we examined the relation between SWIS and relatively more cooperative (vs. self-protective) intentions in social dilemma games. Results of a multilevel regression model with state-level wise reasoning as a predictor of standardized task scores nested within participants indicated that higher level of wise reasoning was positively associated with cooperative intentions across social dilemma tasks, $B = .13$, $SE = .05$, $t(394.60) = 2.66$, $p = .008$. Participants reporting greater wisdom in reflections on personal conflicts were more likely to act cooperatively in the prisoner's dilemma, Spearman's $\rho = .17$, $p = .006$, $N = 261$, and marginally more likely to do so in the commons dilemma, $r = .12$, $p = .065$, $N = 225$.

Concerning the relationship between wise reasoning and conflict-related behaviors, we found that participants who reported greater wise reasoning were also more likely to report engaging in behaviors promoting balanced conflict resolution, $.07 <$ Spearman's $\rho s < .22$, $ps < .001$. Notably, wise reasoning was either unrelated, Spearman's $\rho s = .01$, or negatively related to the engagement in behaviors that inhibit conflict resolution or undermine the other person, $-.13 <$ Spearman's $\rho s < -.11$, $ps < .001$ (see Table 8). This set of associations held across age and gender groups, and also when controlling for presentation order of the materials and socially desirable responding. These findings suggest that state-level wise reasoning is associated with endorsement of cooperative (vs. self-protective) conflict resolution strategies.

Study 5 Summary

Taken together, Study 5 showed that state-level wise reasoning scores captured with the SWIS related to a social orientation toward greater balance between cooperative and self-focused goals, as indicated by more cooperative intentions and behavior across two different domains. In social dilemmas, people with higher wise reasoning were more likely to make cooperative choices that balance communal with self-protective outcomes. Likewise, in their own conflicts, people with higher wise reasoning were more likely to report behaviors that could help to resolve the situation toward mutual benefit (e.g., try to resolve the situation together) and less likely to report behaviors that could benefit the self at the expense of the other person.

Study 6: Balancing Goals, Causal Inferences, and Life Domain Conflicts

Study 6 sought to further probe the relationship between wise reasoning and several aspects of balance, specifically, in the domains of goals, attribution formation, and evaluation of life domain conflicts. Balance is one of the key goals of wisdom (e.g., Kitchener & Brenner, 1990; Kramer, 1990; Labouvie-Vief, 1990). According to Sternberg's (1998) balance theory, wisdom occurs as a process or interaction between individuals and their environment, specifically in adapting to different contexts—wise responding to contexts involves striking a balance between adjusting to the situation versus influencing it. This view of wisdom also requires balancing one's attention to *both* personal and contextual factors to arrive at wise decisions, something that people often fail to accomplish (e.g., Gilbert & Malone, 1995). For example, when making attributions, people often overemphasize contextual factors for forming attributions about their roles and behaviors in negative situations (e.g., conflicts), and underemphasize contextual factors when forming attributions about others' roles and behaviors (Jones & Nisbett, 1972). Wisdom involves forming accurate representations about the particular details about a problem (Sternberg, 1998), which requires balancing attributions about self- versus others' roles in conflict situations, and showing more situational sensitivity when forming judgments about others' behaviors. In line with these ideas, in Study 6 we assessed balance in influence versus adjustment goals, balancing of causal inferences about their own and others' role in the conflict, and increased situational sensitivity in attributions toward others' behavior in the conflict.

In addition to testing balancing at the level of the situation, we also wanted to examine assessments of balance between different types of conflict people may encounter in their own lives. Thus, in Study 6, we compared reports of work-related challenges because of family related concerns as compared to family related challenges because of work-related concerns (Carlson, Kacmar, & Williams, 2000; Greenhaus & Beutell, 1985). We chose the intersection of work and family life domains because work-life conflicts are multidimensional. That is, people tend to report work-life conflict in terms of direction—work interference with family, and

Table 8
Spearman's Correlations Between the Wise Reasoning Index (and Its Five Aspects) and Conflict Resolution Behaviors

Behavior	SWIS index	Perspective	Change	Humility	Compromise	Outsider viewpoint
Find someone to hear both sides	.15***	.07***	.09***	.12***	.08***	.17***
Find someone to give advice	.17***	.11***	.12***	.15***	.12***	.16***
Solve problem together	.24***	.21***	.13***	.14***	.29***	.05*
Forgive	.07***	.11***	.06**	.04†	.09***	−.02
Disengage	−.11***	−.17***	−.08***	−.06*	−.13***	.03
Retaliate	−.13***	−.14***	−.11***	−.11***	−.13***	−.04
Try to find ally	.01	−.03	.01	<.01	−.01	.06*

Note. SWIS = Situated WIse Reasoning Scale.
† $p \leq .08$. * $p \leq .05$. ** $p \leq .01$. *** $p \leq .001$.

family interference with work (Carlson, Kacmar, & Williams, 2000). Using this structure, we could determine the extent to which people report global experiences in conflict for each of these two directions, and whether wise reasoning related to balance in reports of work → family and family → work conflict.

Method

Participants and procedure. Participants in Study 6 were drawn from Sample I, which included some new participants as well as Wave 2 participants explored in Study 2. Participants completed the SWIS, two measures of balancing in goals and judgments about their conflict. Participants then completed three global wisdom measures, counterbalanced in presentation order. Then, they completed a measure of work and family conflicts.

Measures.

Balancing influence and adjustment goals. Participants responded to items assessing the influence and adjustment goals they had when engaging in their conflict. We focused on influence and adjustment goals given their centrality to prior theoretical work on the notion of balance for wisdom (Sternberg, 1998). To this end, we modified several items from an existing trait-style measure of influence and adjustment goals (Tsai, Miao, Seppala, Fung, & Yeung, 2007). Participants were asked how important it was for them to engage in nine different strategies, during their conflict. Example items assessing influence included, "Assert yourself," and "Have the other person listen to what you have to say." Example items assessing adjustment included, "Go along with what the other person wants," and "Make sure that the other person does not see you as getting in his/her way." Participants responded to these statements on a 6-point scale (0 = *not at all important*, to 5 = *extremely important*). The full measure is presented in supplementary material Table 19. Reliabilities for items reflecting influence and adjustment were good (αs ≥ .79). Therefore, the items were averaged into respective indices of influence and adjustment goals ($M_{\text{Influence}}$ = 4.10, SD = 1.20; $M_{\text{Adjustment}}$ = 2.30, SD = 1.10). To estimate the degree of balance between these goals, we calculated the relative strength and intensity of different goals using the similarity-intensity model (Thompson, Zanna, & Griffin, 1995), with S and L representing different goals:

$$(S + L)/2 - |S - L|$$

Higher scores on this metric indicate a greater balance in the weighting of influencing and adjusting goals when navigating one's conflict.

Balancing causal inferences. Participants responded to six items assessing their causal inferences concerning their and the other person's role in the conflict, using a 5-point scale (1 = *not at all*, to 5 = *very much*). Three items concerned self-focused inferences: "Do you think that you were primarily responsible for the incident?" "To what extent were you to blame" and "Could you have been more "wise" in the situation?" Three other items concerned other-focused inferences: "Do you think that the other person was primarily responsible for the incident?" "To what extent was the other person to blame?" and "Could this other person have been more "wise" in the situation?" Reliability for each type of causal inferences was good (αs ≥ .76). Therefore, respective scores were averaged into indices of internal versus external causal inferences (M_{Self} = 2.40, SD = 1.10; M_{Other} = 3.80, SD = 1.40). Similar to the balance in goals, we calculated balance in the weighting of internal and external causal inferences with the similarity-intensity formula depicted above.

Additionally, we assessed the degree of situational sensitivity when evaluating others' behavior by asking participants "Do you think the situation may have influenced this other person to say or do things that they otherwise would not have done?" using the same response scale as above (M = 3.80, SD = 1.40). The full measure is presented in supplementary material Table 20.

Work-family conflict. Participants responded to six items from Carlson, Kacmar, and Williams' (2000) work-family conflict scale. This scale conceptualizes challenges at work and in family life in terms of two directions—work obligations interfering with family life (work → family) and family stress interfering with work (family → work). We used three items assessing each direction. Work → family items included "I have to miss family activities because of the amount of time I must spend on work responsibilities," "I am often so emotionally drained when I get home from work that it prevents me from contributing to my family," and "The behaviors I perform that make me effective at work do not help me to be a better parent and spouse." Family → work items included "I have to miss work activities because of the amount of time I must spend on family responsibilities," "Because I am often stressed from family responsibilities, I have a hard time concentrating on my work," and "Behavior that is effective and necessary for me at home would be counterproductive at work." Participants reported the extent to which they agreed with these statements on a 6-point scale (1 = *strongly disagree*, to 6 = *strongly agree*; α = .78; M = 2.68, SD = 1.06). Items 3 and 6 assess behavioral specificity for work and family domains and did not refer to any challenges, and were therefore analyzed separately (r = .46; M = 2.95, SD = 1.47). Correlations between the two items used for each type of challenge were strong (rs ≥ .63) and were averaged into indices of work → family (M = 3.04, SD = 1.68) versus family → work (M = 2.24, SD = 1.37). Similar to the balance in goals and causal inferences, we calculated a measure of balance between severity of work → family and family → work challenges with the help of the similarity-intensity formula depicted above.

Global wisdom measures. Each participant completed three global trait-level wisdom measures, as described in Study 2, followed by demographics. To avoid carry-over effects, global wisdom scales were presented in a randomized order.

Self-Assessed Wisdom Scale (SAWS). Participants completed the 40-item SAWS (Webster, 2003), see Study 2 for further details on the method (α = *.92; M* = 4.48, SD = 0.62).

Three-Dimensional Wisdom Scale (3D-WS). Participants completed Thomas, Bangen, Ardelt, and Jeste's (2017) abbreviated three-dimensional wisdom scale, which uses 12 items from the original scale, described fully in Study 2 (α = .74; M = 3.42, SD = 0.63).

Adult Self-Transcendence Inventory (ASTI). Participants completed the 16-item ASTI (Levenson et al., 2005), see Study 2 for further details on the method (α = .82; M = 3.61, SD = 0.71).

Results

First, we examined the relations between participants' scores on the SWIS, global wisdom measures, and balancing of influencing

and adjustment goals within their conflict. We conducted multiple regressions predicting influencing and adjusting goals, the first with only wise reasoning as the predictor, and the second (to examine incremental validity of wise reasoning) with all three trait-level wisdom scores in the first step, and wise reasoning in the second step, as predictors. Results are presented in Table 9. In the first regression, we found that wise reasoning predicted greater balancing of influencing and adjusting goals within participants' own conflicts, $B = .41$, $SE = .06$, $t = 7.00$, $p < .001$. In the second regression, in Step 1 we found that the SAWS and 3D-WS negatively predicted balancing goals, whereas ASTI was not significantly associated with goal balance. In the second step, we found that adding wise reasoning to the model resulted in significant incremental variance explaining the balance of influencing and adjusting goals, $\Delta R^2 = .123$ (see SOM for detailed analyses).

Next, we looked at the relations between participants' wise reasoning, global wisdom measures, and the index of balancing causal inferences about their conflict, using identical methods to the previous tests. In the first regression, we found that wise reasoning predicted greater balancing of causal inferences, $B = .14$, $SE = .06$, $t = 2.40$, $p = .017$. In the second regression, in Step 1, global measures were unrelated to the balance of causal inference, though each measure was trending in a negative direction and SAWS negatively predicted the balance of causal inferences in Step 2. Again, we found that adding wise reasoning to the model resulted in significant incremental variance explaining the balance of self- versus other-focused inferences about the cause of conflict, $\Delta R^2 = .018$ (see SOM). Examining participants' degree of situational attributions when evaluating others' behavior (see SOM for full results), in the same manner as the previous two tests, we additionally found that wise reasoning predicted more situational attributions, $B = .27$, $SE = .07$, $t = 3.72$, $p < .001$. In the second test, the SAWS also predicted more situational attributions. The 3D-WS and ASTI did not predict situational attributions, and the ASTI trended in the negative direction. Finally, adding wise reasoning to the model explained a significant additional variance in situational attributions, $\Delta R^2 = .015$.

Last, we examined the relations between participants' wise reasoning, global wisdom measures, and balance of two different types of life challenges (work → family vs. family → work), with methods identical to those in the previous tests, focusing only on participants who were employed. In the first test, we found that wise reasoning predicted balanced reports of severity of different types of challenges, $B = .19$, $SE = .06$, $t = 3.14$, $p = .002$. In the second test, the 3D-WS predicted less balance and the ASTI predicted marginally less balance; the SAWS did not predict balance. In the third test, adding wise reasoning to the model resulted in significant incremental variance explaining the balance between different challenges, $\Delta R^2 = .024$. Notably, these effects of balance were not because of greater moderacy-bias among wise reasoners. As supplementary analyses indicated, higher SWIS scores were linked to greater focus on adjustment goals and consideration of personal responsibility for the conflict.

Study 6 Summary

Study 6 showed that state-level wise reasoning related to several indices of situational balancing within people's own conflicts. We found that wise reasoning predicted greater balance in influence and adjustment goals, greater balance in people's inferences about the causes of their conflicts, and more situational attributions of others' behaviors in the conflict. In supplementary analyses, we found that these effects were a result of participants' wise reasoning relating to increased adjustment goals (vs. influencing goals), and increased internal attributions (vs. external attributions) about their conflicts. In contrast, global wisdom scores were either unrelated or, more often, negatively related to these indices of balance. We also found parallel results in people's general ratings of balance in their own life, as shown in more balanced reporting of work → family compared to family → work conflict. In sum, Study 6 showed strong evidence that wise reasoning relates to balancing at both the state- and general-level.

Study 7: Wise Reasoning Across Distinct Conflicts

Study 7 had three goals. First, we aimed to further probe the reliability and factor structure of the wise reasoning construct using a different, socioeconomically, and culturally heterogeneous sample of nonstudent community participants. Prior research suggests possible cross-cultural differences in the meaning of wisdom

Table 9
Unstandardized Coefficients (SE Estimates in Parentheses) From the Hierarchical Regression Analyses Predicting Balanced Influencing and Adjusting Goals, Causal Inferences, and Work/Family Challenges in Study 5

	Influencing and adjusting goals		Causal inferences		Work-family conflict	
Predictor	Step 1	Step 2	Step 1	Step 2	Step 1	Step 2
Intercept	3.95*** (.46)	5.12*** (.45)	2.66*** (.45)	3.09*** (.46)	1.99*** (.50)	2.51*** (.52)
SAWS	−.40*** (.12)	−.61*** (.11)	−.19 (.12)	−.27* (.12)	−.10 (.13)	−.18 (.13)
3D-WS	−.36*** (.10)	−.37*** (.10)	−.14 (.10)	−.15 (.10)	−.23* (.11)	−.24* (.11)
ASTI	.07 (.10)	.03 (.10)	−.03 (.10)	−.05 (.10)	.18 (.11)	.15 (.11)
SWIS		.55*** (.06)		.20*** (.06)		.23*** (.06)
R^2	.06	.19	.02	.04	.01	.04
ΔR^2		.12***		.02***		.02***

Note. SWIS = Situated WIse Reasoning Scale; SAWS = Self-Assessed Wisdom Scale; 3D-WS = Three-Dimensional Wisdom Scale. ASTI = Adult Self-Transcendence Inventory.
* $p < .05$. *** $p < .001$.

(Grossmann & Kung, in press, for a review), as well as performance on wise reasoning tasks (Grossmann et al., 2012). Given that Studies 1–6 in the present research used North American participants, we explored whether the reliability and factor structure of situated wise reasoning and its relationship to balance generalizes beyond North American populations on MTurk. Second, we aimed to replicate and extend the results from Studies 2 and 6, evaluating the stability of wise reasoning (Study 2), and the intraindividual variability in the relationship of wise reasoning to balance indices (Study 6). In Study 2, participants were free to recall any conflict they wished. If participants selected a conflict for the second session that was qualitatively similar to the one they recalled in their first session, it could have artificially inflated the relations between Wave 1 and Wave 2 wise reasoning. To address this issue, we assessed participants' reasoning about two distinct conflict episodes in the same session. Third, Study 7 examined the *relative* contribution of state- and trait-level components of wise reasoning for balance indices across several distinct conflicts assessed on the same participants.

Method

Participants and procedure. We collected data from 300 noncollege participants collected through Prolific Academic (ProA; Sample J), an organization that matches researchers with a community sample of individuals willing to complete studies for reimbursement. ProA retains a more culturally diverse population of participants, who have been shown to be more naïve and conscientious than MTurk workers (Peer, Brandimarte, Samat, & Acquisti, 2017). ProA participants came from different countries, 43% = North America (4.3% = Canada, 0.7% = Mexico, and 38.0% = United States), 51.2% = United Kingdom/Ireland, 5.2% = other (e.g., Australia, Germany, Israel, Spain, and Hong Kong; see online supplement for full details). Full sample characteristics are in Table 1. Study 7 participants were compensated 2.5£ for 25 min of their time.

Participants completed a two-part study, separated by a standard filler task (a series of four simple anagrams). In the first half of the survey, participants completed the wise reasoning measure about a recent interpersonal conflict, and two indices of balancing goals and causal inferences within their conflict as in Study 6. In the second half, participants completed the same measures as in the first half but were asked to think of a different recent interpersonal conflict than that recalled in the first half. Specifically, participants first recorded the type of conflict in the first wise reasoning assessment: (a) with a friend, (b) a coworker, (c) a romantic partner, or (d) a family member. Upon completion of the SWIS, goals, and inference-related measures for the first situation, the survey automatically instructed participants to reflect on a type of conflict that was distinct from the first one. Participants then completed another global wisdom measure (described below).

Measures.

Situated WIse Reasoning Scale (SWIS). For each conflict, participants filled out the hybrid measure of wise reasoning. Reliabilities for each aspect of wise reasoning were good, Conflict 1: $\alpha_{\text{Perspective:}} = .82$, $\alpha_{\text{Change,}} = .82$, $\alpha_{\text{Humility}} = .75$, $\alpha_{\text{Compromise}} = .84$, $\alpha_{\text{Outsider}} = .91$; Conflict 2: $\alpha_{\text{Perspective:}} = .87$, $\alpha_{\text{Change,}} = .83$, $\alpha_{\text{Humility}} = .82$, $\alpha_{\text{Compromise}} = .88$, $\alpha_{\text{Outsider}} = .93$. To compare results across two conflicts, we averaged individual items into five first-order scores, which we subsequently averaged into a second-order score. This way, each aspect of wise reasoning remained equally weighted in the composite index.

Balancing influence and adjustment goals. Participants completed the identical measure to the one reported in Study 6. Reliabilities for influence and adjustment goals were good (αs $>$ .78). Therefore, respective scores were averaged into indices of influence goals and adjustment goals, which were in turn subjected to a similarity-intensity formula to obtain a relative degree of balance in conflict-related goals. Central tendency for Study 7 variables presented in Table 10.

Balancing causal inferences. Participants completed the identical measure to the one reported in Study 6. Reliabilities for self-focused and others-focused causal inferences were good (αs $>$ .80). Therefore, respective scores were averaged into indices of self- and others-focused causal inferences, which were in turn subjected to a similarity-intensity formula to obtain a relative degree of balance in causal inferences. As in Study 6, additionally, we measured sensitivity to situational inferences when evaluating others' behavior.

Table 10
Descriptives and Intercorrelations of variables in Study 7

Variables	*M*	*SD*	Correlations 1	2	3	4
Conflict 1						
1. BWSS	3.48	.49				
2. SWIS	2.94	.75	.18**			
3. Balanced goals	1.18	1.43	−.02	.19**		
4. Balanced causal inferences	1.26	1.34	−.06	.14*	.24**	
5. Situational sensitivity	3.17	1.22	.09	.25**	.07	.18**
Conflict 2						
1. BWSS	3.48	.49				
2. SWIS	3.01	.81	.19**			
3. Balanced goals	1.24	1.57	−.02	.33**		
4. Balanced causal inferences	1.06	1.30	−.13*	.14*	.23**	
5. Situational sensitivity	3.13	1.27	−.02	.13*	.10	.14*

Note. BWSS = Brief Wisdom Screening Scale; SWIS = Situated WIse Reasoning Scale.
* $p \leq .05$. ** $p \leq .01$.

Global wisdom measure. Participants completed Glück et al.'s (2013) Brief Wisdom Screening Scale (BWSS), which takes 20 items based on the longer-format scales—the SAWS, the 3D-WS, and the ASTI—on a 5-point scale (1 = *strongly disagree*, to 5 = *strongly agree*). This measure was chosen for pragmatic considerations of reducing time commitment of participants, and because it assesses the most central aspect across most common global wisdom scales (SAWS, 3D-WD, and ASTI), as identified by Glück and colleagues (2013) in their prior research. Reliability of this measure was good ($\alpha = .85$). Therefore, the items were averaged into a single index of global wisdom.

Results

To this point, all of our tests have been conducted on responses from participants residing in North America. Thus, we wished to examine any cultural differences in the structure of wise reasoning as a function of the region from which responses were drawn. We first examined the factor structure and reliability of wise reasoning per region: North American participants, and non-North American participants. Given that a small portion of non-North American responses came from outside the United Kingdom, we also provide results of the same tests as above omitting non-United Kingdom responses in the online supplement, finding nearly identical results. As in previous studies, for both sampling points we conducted principal components analyses on five indices of wise reasoning (first conflict: North America: 55% variance explained; non-North America: 63% variance explained; second conflict: North America: 69% variance explained; non-North America: 70% variance explained). To examine the factor structure across regions and conflicts, we then conducted region-specific (North American vs. non-North American) principal component analyses. As seen in Table 4, factor loadings across regions were very similar to one another, and to those found for MTurk and student samples, presented in Study 1 (see Table 4). For the first conflict that we assessed, Cronbach's $\alpha_{\text{North America}} = .91$, and $\alpha_{\text{non-North America}} = 93$; for the second conflict that we assessed participants, Cronbach's $\alpha_{\text{North America}} = .91$, and $\alpha_{\text{non-North America}} = 94$. Given the similarities in factor structure and reliabilities between regions, in subsequent analyses, we collapsed regions and tested all participants as a single group.

Testing the convergence of SWIS across all participants, we found a small-moderate degree of intraindividual stability in wise reasoning across sampled conflicts, $r_{WR} = .29$, suggesting substantial intraindividual variability in wise reasoning across different contexts. We found similar results with each individual aspect of wise reasoning, $r_{\text{Perspectives}} = .18$, $r_{\text{Multiple Outcomes}} = .24$, $r_{\text{Limits}} = .24$, $r_{\text{Compromise/Resolution}} = .16$, $r_{\text{Outsider's Viewpoint}} = .45$. Further zero-order correlations of focal variables in Study 7 are presented in Table 10. SWIS scores were related to global wisdom scores and, in contrast to global wisdom scores, were also related to all balance-related criteria, in both Conflict 1 and Conflict 2.

Next, we examined the contribution of trait-level (i.e., average across two state-level scores; Finnigan & Vazire, 2017; Fleeson & Jayawickreme, 2015) and state-level (i.e., state-specific deviation from the average) wise reasoning in predicting balance-related indices. Specifically, for each of the balance-related criterion variables, we conducted multilevel generalized linear model analyses, with balance scores nested within individuals, and global wisdom, trait-level wise reasoning, and state-specific wise reasoning as predictors. We conducted separate multilevel mixed effect models (with responses nested within participants), one with just wise reasoning indices as predictors, and another to examine incremental variance over global wisdom scores. Results presented in Table 11 indicate that both trait-level and state-specific wise reasoning predicted significantly greater balancing of influencing and adjusting goals and greater balancing of causal inferences. In contrast, global wisdom scores were negatively related to balance in causal inferences and trended in the negative direction for balanced influence and adjustment goals. This latter effect was largely driven by an effect of global wisdom scores on attributing less blame for the situation on the self (see SOM for complete Study 7 analyses).

Study 7 Summary

Study 7 presented further evidence for the generalizability of the factor structure and reliability of the SWIS. Reliability and internal structure of wise reasoning were nearly identical to those from our initial tests. Study 7 showed a small-moderate degree of stability in wise reasoning across two distinct conflicts, indicating substantial intrapersonal variation in wise reasoning across situations (as in Grossmann et al., 2016, and Study 2 in the current research). State and trait wise-reasoning scores were consistently and positively related to balance, in

Table 11
Unstandardized Estimates (and SEs) from Multi-Level Models Predicting Balanced Influencing and Adjusting Goals and Causal Inferences in Study 7

	Influencing and adjusting goals		Causal inferences	
Predictor	Model 1	Model 2	Model 1	Model 2
Intercept	1.38^{***} (.53)	$.23^{***}$ (.55)	2.16^{***} (.43)	1.53^{***} (.47)
BWSS	−.05 (.15)	−.22 (.15)	$-.27^{**}$ (.12)	$-.36^{**}$ (.12)
Trait SWIS		$.59^{***}$ (.12)		$.32^{***}$ (.10)
State SWIS		$.45^{***}$ (.10)		$.18^{\dagger}$ (.10)
AIC	2132.10	2090.00	2016.90	2007.10

Note. BWSS = Brief Wisdom Screening Scale; SWIS = Situated WIse Reasoning Scale; AIC = Akaike's Information Criterion.
$^{\dagger} p < .10$. $^{**} p < .01$. $^{***} p < .001$.

terms of balancing one's influencing and adjustment goals, and in one's attributions toward others in one's conflicts. This was not the case for global wisdom scores, which showed either nonsignificant or significant negative relations to balance-related indicators. In summary, replicating findings from Studies 1, 5, and 6, SWIS scores showed strong reliability and related to balanced psychological functioning, over-and-above that of the most central items from three most widely used global wisdom measures (Glück et al., 2013).

Study 8: Demographic and Social-Contextual Effects

Finally, in Study 8, we conducted exploratory tests of the effects of demographics and social-contextual variables on wise reasoning across all responses to this point (Samples A–G, I, and J), for which we assessed single-shot SWIS. Given much debate and research on wisdom as a function of age (e.g., Ardelt, 2011; Grossmann et al., 2010, 2012; Jordan, 2005; Staudinger, 1999), and theorizing about curvilinear effects of age on wisdom-related qualities (e.g., Labouvie-Vief, 1990), we examined wise reasoning as a function of age and age^2. Similarly, there has been some recent attention to possible gender differences in wisdom-related qualities (e.g., Aldwin, 2009; Ardelt, 2009; Levenson, 2009), and therefore we examined wise reasoning as a function of participant gender. Given the situation-specific focus of the present method for assessing wisdom-related qualities, we were also able to evaluate how SWIS scores are impacted by gender of the other person in participants' conflicts, and the Participant Gender × Gender of the Other Person interaction (i.e., "gender-context"). To generalize our results across other sociodemographic factors, in exploratory analyses, we also tested wise reasoning as a function of ethnicity, education, employment status, and participants' perceptions of the level of seriousness of their conflict. We first examined across MTurk and student North American participants (Samples A–G and I), and then examined ProA North American and non-North American participants (Sample J) separately, with an aim to exploring whether we would replicate the effects on the more regionally heterogeneous sample.

Results

North American samples (MTurk and college students). We first conducted a large-scale test of the relationships between demographic and social-contextual variables and wise reasoning on Samples A–G and I. First, we conducted a multiple regression with SWIS scores as the criterion and gender, age, and age^2 (to explore possible curvilinear effects of age) as the predictors. We found that men reported lower wise reasoning than women, $t(3547) = -2.89$, $p = .004$ (see Figure 5). There were also significant linear and quadratic effects of age, age: $t(3547) = -7.22$, $p < .001$, age^2: $t(3547) = 4.51$, $p < .001$. To get a fuller understanding of the nature of the curvilinear effect of age, we plotted the data and used the loess function to fit the trend (see Figure 4), which indicated that wise reasoning decreased with age until approximately age 45, and then appeared to increase. To further analyze the effect, we created two groups, one including younger participants (age ≤45; Group 1), and one with older participants (age >45; Group 2), analyzing them separately for the effect of age on wise reasoning. In line with the curvilinear findings, we found a negative effect of age on wise reasoning in Group 1, $t(3034) = -5.72$, $p < .001$, and a positive effect of age on wise reasoning in Group 2, $t(520) = 2.08$, $p = .038$.

An omnibus analysis of variance (ANOVA) of ethnicity (Black = 1, Asian = 2, Latino = 3, Other = 4, White/European = 5) on wise reasoning revealed a significant effect, $F(4, 3096) = 3.78$, $p = .005$. Exploratory post hoc comparisons showed that, compared with Black participants, White participants reported engaging in wise reasoning more, $t(3096) = 1.98$, $p = .048$, as did "Other" ethnicity, $t(3096) = 2.50$, $p = .013$. Other comparisons were not significant. We also examined wise reasoning as a function of education (high school = 1, some college = 2, college = 3, postgraduate = 4) and employment status (No/Yes), finding no significant effects, $ps > .819$.

Finally, we examined wise reasoning as a function of social-contextual factors, including perceived conflict seriousness and gender of the other party. To fully understand the latter variable, we also added participants' gender and their Personal × Other Party Gender interaction as predictors. Results indicated that greater perceived seriousness of conflicts predicted significantly higher wise reasoning, $t(2163) = 5.13$, $p < .001$. We also found a significant effect of the gender of the other person in participants' conflicts, with higher wise reasoning when people were in a conflict with a female, $t(2163) = 2.43$, $p < .015$, and a nonsignificant trend for the two-way interaction between participant gender and gender of the other person in their conflict, $t(2163) = -1.60$ $p = .11$. To examine the interaction, we analyzed the effect of gender of the other person in participants' conflicts separately for female and male participants. Here, we found that male participants had significantly higher wise reasoning when the other person in their conflicts was a female versus a male, $t(1191) = -2.38$, $p = .017$, whereas we observed no significant effect for women, $t(1594) = -1.61$, $p = .11$ (see Figure 5).

Prolific academic sample (Sample J). Next, we tested the contribution of demographic and social-contextual variables to wise reasoning in Sample J ($n = 300$). It was important to examine this sample separately because it was a community sample consisting of participants living in different cultures. To explore whether contextual effects generalize beyond North American context (Henrich, Heine, & Norenzayan, 2010), we included region as one of the contextual factors into multilevel analyses with wise reasoning for each of the two conflicts nested within participants. Other contextual variables included age, age^2, level of education, employment (No/Yes), perceived seriousness of the conflict, gender, and gender of the other person in the conflict. Given substantial heterogeneity in ethnic make-up and its meaning across countries in the non-North American sample, and given insufficient power for some of the ethnic groups in the Prolific Academic sample, we opted not to examine ethnicity-related relationships in the analyses involving Prolific Academic sample.

Replicating the MTurk/student results, analyses indicated higher wise reasoning when participants perceived their conflict to be

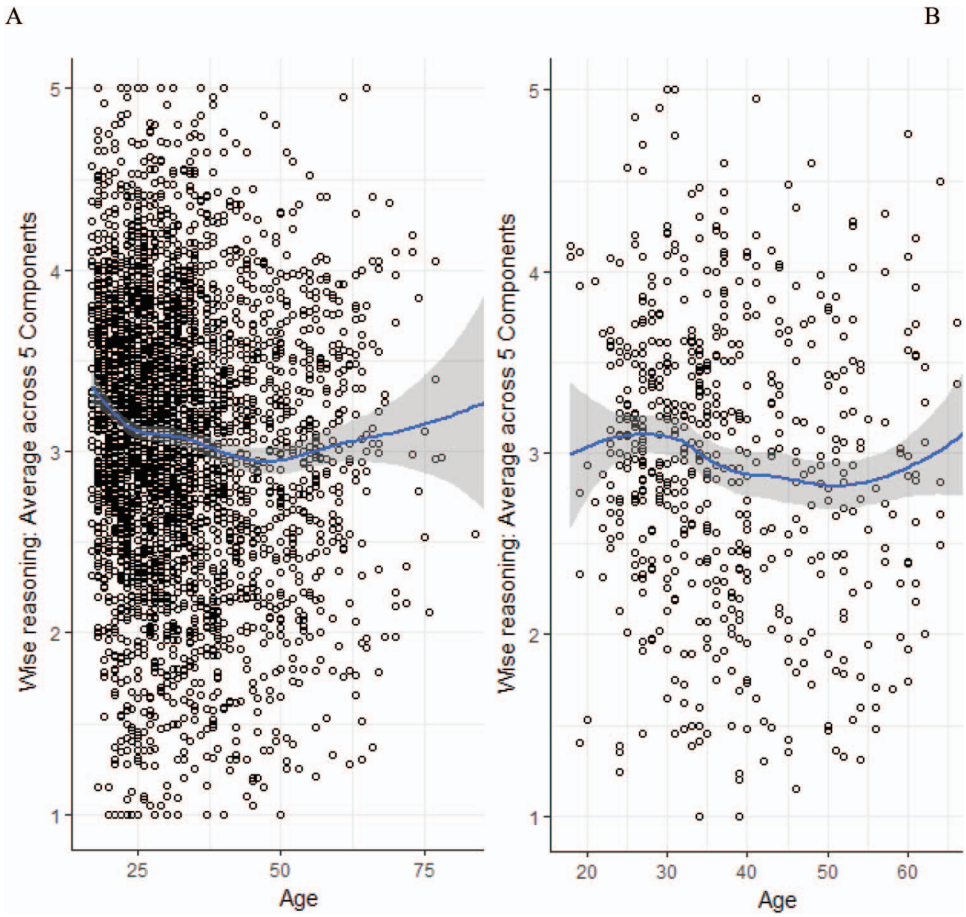

Figure 4. Curvilinear effects of participant age on state-level wise reasoning in conflicts. Panel A: Mturk and Student Samples C–I; Panel B: Prolific Academic Sample J. See the online article for the color version of this figure.

more serious, $t(569.50) = 2.59$, $p = .010$.[7] Further replicating MTurk results, we observed a linear and quadratic trends of age, age: $t(287.40) = -2.45$, $p = .015$, age^2: $t(286.70) = 1.60$, $p = .111$ (see Figure 4), as well as a significant effect of gender, $t(285.70) = 1.96$, $p = .050$, and Participant Gender × Other Person's Gender interaction, $t(535.60) = -1.71$, $p = .09$. Linear effects of age, as well as gender-specific interactions were moderated by region. Therefore, we further analyzed North American and non-North American samples separately. Looking at North American sample, we found no significant effect of age, $t(122.67) = -0.75$, $p = .454$, and no gender-related effects, ps $> .172$. Looking at the non-North American sample, we found a negative effect of age, $t(169.80) = -2.80$, $p = .006$, as well as a Gender × Other's Gender interaction, $t(318.00) = -2.87$, $p = .004$. Replicating the MTurk results on the non-North American sample, men showed significantly wiser reasoning in conflicts with women than with men, $t(129.74) = 2.43$, $p = .017$ (see Figure 5).

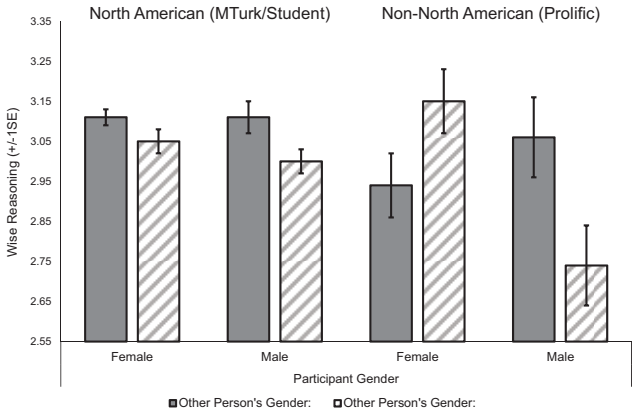

Figure 5. Gender-context (Gender × Other Person's Gender interaction) effects in Study 8.

[7] Do wiser reasoners consider social conflicts as more serious or does the relationship between perceived conflict seriousness and wise reasoning rather reflect state-specific effects? To address this question, we examined whether trait versus state-level wise reasoning contributes to perceived conflict seriousness. Results of a multilevel model with conflict-specific ratings of seriousness nested within participants indicated that state-level wise reasoning was significantly associated with seriousness, $B = .189$, $SE = .087$, $t(297.22) = 2.17$, $p = .031$, whereas trait-level wise reasoning was not, $B = .097$, $SE = .080$, $t(296.94) = 1.21$, $p = .228$, ΔAIC = 2.70.

Notably, for women we observed a nonsignificant reversal, $t(189.90) = -1.93$, $p = .055$.

Study 8 Summary

Study 8 explored variability in wise reasoning as a function of demographic and social-contextual characteristics. The results indicated that people are more likely to report wise reasoning as a function of perceived seriousness of the conflict. Further, we observed that wise reasoning scores decreased as a function of age until approximately 45 years of age, and increased after that. This finding appears to connect with Labouvie-Vief's (2003) theoretical position on life span development of socioemotional processes and complex cognitions, which suggests the lower likelihood of mastering complex cognitive processes in middle adulthood as compared to younger and older adulthood. Notably, this effect was more prominent in the MTurk samples compromised of United States and Canadian participants. Though a similar curvilinear effect of age was also noticeable in the Prolific Academic sample, it was weaker and largely driven by North American subsample. In contrast, looking at the non-North American ProA subsample (consisting predominantly of Western European participants), we mainly observed a linear negative effect of age on wise reasoning. We will return to the cross-sample difference in sociodemographic findings in the general discussion. Finally, we found several significant social-contextual effects. North American MTurk and student participants (Samples A–G and I) were more likely to report higher wise reasoning when they were in a conflict with a woman, but this finding was qualified by an interaction showing that male participants were driving the effect: men reported lower wise reasoning when they were in a conflict with another male. Participants from the more culturally diverse Prolific Academic sample (Sample J) were more likely to report wiser reasoning when they were in a conflict with someone of the opposite gender. The latter gender-specific interaction, along with a negative effect of age, was particularly pronounced among the non-North American subsample of Prolific Academic.

General Summary and Discussion

Despite many inspirational books ready to teach one how to become wiser, psychological scientists have so far been unable to provide practical and reliable methods to assess wisdom. Some scholars have used global self-assessed measures of wisdom, which produce memory-related biases, and biases concerning bias blind spot (Pronin et al., 2002) and social desirability (Paulhus, 1988). Other scholars have used narrative techniques to examine wisdom-related reflections in concrete difficult life situations (Baltes & Smith, 2008; Grossmann et al., 2013; Staudinger et al., 1994). However, such narrative techniques are expensive, require situation-specific codebooks, often target hypothetical scenarios (vs. personally relevant concerns), and can be inefficient for large-scale ecological assessments. In addition, past literature on wisdom is limited by a lack of clarity about criteria by which wisdom-related characteristics should be evaluated. In particular, although the concept of balance appears to be a central outcome in several popular theories on wisdom (e.g., Baltes & Smith, 2008; Grossmann, 2017; Staudinger & Glück, 2011; Sternberg, 1998), the link remains theoretical, with little empirical scholarship testing the relationship of characteristics attributed to wisdom against indices of balancing one's interests and inferences about the world.

Building on recent insights in psychology and survey methodology (Schwarz et al., 2009), we introduced a new hybrid method—Situated WIse Reasoning Scale (SWIS)—aiming to provide an efficient, yet reliable and accurate way to assess wisdom-related responses. This method operates on the level of a situation and by doing so allows for context-sensitive reconstruction of wise reasoning in a survey-based format (Schwarz et al., 2009). Examination of the psychometric properties of the SWIS indicates that it provides accurate responses that are either unrelated or negatively related to a host of bias-related tendencies, from social desirability—self-deception and impression management—to bias blind spot and attributional bias. In contrast, global methods to assess wisdom were vulnerable to these psychological biases. Further testing of SWIS indicates remarkably similar factor structure and reliability across regions compromised of sociodemographically diverse samples, speaking to the ecological generalizability of the method. The current methodological application extends prior research on advantages of event-reconstruction, compared with global assessments, for measuring everyday life experiences (Kahneman et al., 2004; Schwarz et al., 2009). Further, it contributes to an emerging scholarship on the relationship between wisdom and unbiased thought (e.g., Gilovich & Ross, 2015; Grossmann et al., 2016) by proving a more precise tool for testing the effect of wisdom on bias.

Moreover, the hybrid method allowed us to establish the connection between wisdom-related cognition and balancing of interests, trade-offs, and inferences one makes about the social world. We found that wise reasoning was not only related to balance between self-focused and other-oriented intentions in classic decision-making tasks, but also to people's tendency to strike a balance between their influence and adjustment goals, and between their attributions to the self versus another party in their conflicts. Conversely, global wisdom measures were either unrelated or more often inversely related these markers of balance. Thereby, the current research provides the first large-scale empirical support to the conceptual claims of numerous wisdom scholars (e.g., Grossmann, 2017; Staudinger & Glück, 2011; Sternberg, 1998).

Utility of Process-Oriented Measurement of Wisdom-Related Characteristics

Recent insights from research on personality and social cognition both call for greater attention to state-level processes for a deeper understanding of psychological phenomena. Personality psychologists have pointed out that greater attention to the state (vs. global) levels of analysis can provide a more holistic perspective on how traits are represented through the profiles of density distributions respecting specific states (Fleeson, 2001; Mischel & Shoda, 1995). According to this research, multistate measurements provide a more accurate estimate of individual differences and allow for the detection of systematic patterns of responding to situational contingencies (Mischel & Shoda, 1995). Simultaneously, social–cognitive researchers have pointed out that cognitive processes are not isolated inner representations but rather interdependent with the current physical, social, and cultural environment, as demonstrated in the domains of knowledge accessibility (Yeh & Barsalou, 2006), affect and judgment (Schwarz, 2011),

cognitive style (Wegner, Vallacher, Kiersted, & Dizadji, 1986), and the theory of "situated social cognition" (Smith & Semin, 2007).

The present hybrid method of state-level wise reasoning integrates these insights, showing that people vary in their wise reasoning across situations and respond with more or less wise reasoning depending on the features of the situation (Grossmann, 2017, in press; Santos, Huynh, & Grossmann, in press). For instance, we found that wise reasoning was associated with situations that participants viewed as more serious. This observation is not trivial and may appear counterintuitive at first: serious conflicts can be more polarizing, with lower willingness to adopt others' perspectives. We also observed that male participants were more likely to reason wisely in conflict situations involving a female rather than a male counterpart (see Figure 5). Though further work is needed to replicate these observations and explore potential underlying influences from culture and gender norms (e.g., Eagly, 2009), these preliminary observations provide further evidence to the utility of the hybrid method. Revealing seriousness and gender-related findings would not have been possible without shifting the focus from traditional global reports to the current state-level of analysis.

By providing an opportunity for new insights concerning the role of situational contingencies for wisdom, the state-level measurement of wise reasoning contributes to an empirical foundation for nurturing new developments of wisdom-enhancing environments (Grossmann, 2017, in press; Santos et al., in press). In particular, the state-level measurement of wise reasoning (across multiple situations) can be a valuable tool for examining which components of wisdom are dispositional and which are state-specific (Fleeson & Jayawickreme, 2015; Fleeson & Noftle, 2008a, 2012; McCabe & Fleeson, 2016; Mischel, Shoda, & Mendoza-Denton, 2002). By assessing wisdom via a global single-shot measurement of wisdom-related characteristics (Ardelt, 2003; Levenson et al., 2005; Webster, 2003, 2007), prior studies have made an implicit assumption that wisdom-related qualities are rather stable individual differences. However, global single-shot measures make it impossible to determine whether responses reflect intraindividually stable differences in wisdom, differences in bias, or some features of the situation. In contrast, the hybrid method assesses wisdom-related characteristics on the level of the situation. As demonstrated in Study 7, it is ideally suited for multisituation assessment (e.g., examining interactions with parents vs. close friends), enabling researchers to differentiate situational contingencies from the trait-level tendencies by averaging responses across situations (Fleeson & Jayawickreme, 2015; Grossmann, Gerlach, & Denissen, 2016; Mischel et al., 2002). Indeed, the simultaneous analyses of trait- and state-level components of wise reasoning on markers of balance indicated a unique contribution of each component, suggesting that both trait and state-specific factors contribute to balancing of interests and inferences that people make about the world around them. This finding is noteworthy, as it suggests that it is not only the case that wiser reasoners tend to be more balanced on average, but also that people are likely to be more balanced in situations that they express wise reasoning above their average level.

Moreover, separating trait from state-level components of wise reasoning enables a better understanding of the relationship between wise reasoning and seriousness. Specifically, we were able to evaluate whether the relationship between wise reasoning and seriousness means that wise reasoners are more aware of the seriousness of the situation (trait-level effects) or whether people are more motivated to reason wisely in the face of more challenging situations (i.e., state-level effect). Our results indicated that this relationship was mainly present at the state level of analysis. Future work targeting these multilevel questions will benefit from the present hybrid method, especially when integrating it with experimental or longitudinal designs to unpack the complexity within these questions.

From a practical perspective, the ability to measure situational contingencies of wisdom-related characteristics in an ecologically sensitive manner can also contribute to greater knowledge about how wisdom may be practiced, developed, and enhanced across a variety of settings (e.g., health-promotion, education, and business). Given that desirable psychological tendencies and processes may be harmful in some situations (McNulty & Fincham, 2012), the current method also makes it possible to determine conditions under which engaging in wise reasoning may, in fact, be maladaptive.

Finally, the state-level measurement of wise reasoning affords novel inquiries about the stability of wise reasoning across multiple situations and offers practical estimates of how many measurement units may be necessary for an accurate estimation of individuals' tendency to reason wisely. The present results in Studies 2 and 7 reveal that the extent to which individuals express wise reasoning varies substantially over time and across different situations, dovetailing with emerging evidence on day-to-day variability in wise reasoning (Grossmann et al., 2016). Nonetheless, we also observed a moderate degree of convergence (over time: $r = .48$ and across distinct situations: $r = .31$). Applying the Spearman-Brown Prophecy formula, it appears that to obtain average reliability of .70, one would require at least two sampling units if the sampled episodes are similar (e.g., in type; in level of seriousness), and even more sampling units if they are heterogeneous (also see Santos et al., in press, for a fuller discussion of intra-individual reliability of wise reasoning across existing studies). One practical recommendation would be first to consider what degree of reliability one would deem acceptable, and second consider whether one wants to sample individuals in similar or diverse contexts. For a high degree of reliability, a few sampled episodes may not be sufficient when evaluating performance across diverse contexts. However, if a lower degree of reliability is acceptable; three sampling points may be enough to obtain a trait-level estimate. Based on the present insights, three measurement points with at least two distinct types of situation may be a good compromise between accuracy and ecological applicability across distinct situations.

Theoretical Implications

Beyond providing empirical support for the notion of balance as a key criterion in numerous wisdom theories (e.g., Grossmann, 2017; Staudinger & Glück, 2011; Sternberg, 1998), the insights from the state-level hybrid method generate several new ideas for advancing theorizing about wisdom. First and foremost, state-level measurement provides a fruitful foundation for testing the *process-oriented* aspects of wisdom. The notion of process is evident across numerous theories (for reviews, see Grossmann, 2017;

Staudinger & Glück, 2011). For instance, as noted earlier, Sternberg indicated that "information processing in and of itself is not wise or unwise. Its degree of wisdom depends on the fit of a wise solution to its context" (Sternberg, 1998, p. 353). Similarly, scholars such as Baltes and Staudinger (1996) have theorized how the meaning and function of wisdom operates within the larger sociocultural context. The hybrid method for assessing wise reasoning advances these insights empirically, providing an efficient platform for evaluating the role of contextual factors in understanding how wisdom-related qualities manifest and develop. It does so by conceptualizing individual differences in wise reasoning as a density distribution of specific states.

Notably, the notion of a situation-sensitive distribution of how wisdom-related characteristics are expressed by a given individual has two critical implications. First, it suggests that any theoretical claims about the relationship between wisdom and various well-being enhancing or prosocial tendencies ought to consider the level of analysis. For instance, consider the debate about the role of wisdom-related characteristics for various markers of subjective well-being (for review, see Grossmann, 2017): Whereas some scholars suggest that wisdom may promote more positive emotions and greater life satisfaction (e.g., Bergsma & Ardelt, 2012), other scholars proposed that wisdom is linked with a deeper understanding of twists and turns of one's life and, therefore, may not necessary contribute to one's subjective feeling of happiness (Staudinger & Kunzmann, 2005). More important, in most of these cases wisdom-related characteristics were measured only once; thus, it is unclear whether effects concerned trait- or state-level associations between wisdom and happiness or mood, or could even be accounted by various additional situational contingencies (e.g., desire to present oneself in a positive light; Zacher et al., 2013). The present observation of separate trait- and state-level effects of wise reasoning suggest that through paying attention to state- versus trait-level effects and measuring wisdom-related characteristics several times, one can obtain a more precise estimate. Indeed, using this approach, recent work began to advocate that wise reasoning is a more potent correlate of well-being on a state- as compared with trait-levels of analysis (Grossmann et al., 2016). Whereas wise reasoners may not necessarily be happier people (consistent with Staudinger & Kunzmann, 2005), wiser reflection on a concrete situation at hand may in fact be aligned with psychological benefits of more adaptive emotion regulation and greater satisfaction with one's life (Gross & Thompson, 2007; Kekes, 1983, 1995; Kross & Ayduk, 2011). In a given situation, focusing on sustaining one's well-being may be a healthy tendency. However, if this principle is used rigidly across all contexts, it may likely backfire (e.g., Ford et al., 2015; Grant & Schwartz, 2011).

In a similar vein, attention to context is important when evaluating claims about the relationship between wisdom-related characteristics and prosociality (Sternberg, 1998). Past research has indicated that though prosociality can be of universal advantage for individual and group survival, prosociality is expressed to different degrees across various contexts, especially when comparing (post-) industrial versus small-scale societies (e.g., Henrich et al., 2010). In particular, the meaning of prosocial acts tends to vary as a function of expectations of trust toward ingroup versus strangers, such that differences in degree of trust toward ingroup versus strangers lead to different patterns of prosociality, as demonstrated in numerous comparisons of East Asian versus North American contexts (Huff & Kelley, 2003; Yamagishi, 1988; Yamagishi, Jin, & Miller, 1998; cf. Buchan & Croson, 2004; Yuki, Maddux, Brewer, & Takemura, 2005). The relationship between wise reasoning and prosocial behavior is sensitive to situational context as well, as demonstrated in a recent experimental study on the role of deliberation for a robust association between these characteristics (Grossmann, Brienza, & Bobocel, 2017).

Second, when building a developmental theory of wisdom (Erikson, 1984; Loevinger & Blasi, 1976), the notion of traits as a distribution of numerous states allows for a more fine-grained understanding of how hypothesized antecedents of wisdom interact in fostering this quality. For instance, instead of conceptualizing ideas of mastering the developmental dialectics of integrity versus despair (Erikson, 1984) as a developmental stage of a person, the current approach allows probabilistic modeling of the way personal characteristics interact with the ever-changing environment the person finds themselves in (for a similar interactionist argument, also see Loevinger & Blasi, 1976). Thereby, the current approach enables a more accurate portrayal of the ways people, in fact, develop wisdom-related skills over time. In short, instead of merely speculating about the dynamic nature of wisdom as is the case to date, the current method allows for actual dynamic modeling of the relationship between the person and their situation.

Limitations and Future Directions

Future research using a reliable tool for assessing wise reasoning on the level of a situation can help to integrate an apparent paradox in the domains of social psychology and mental health. Is wisdom always characterized by unbiased thought or is it possible, as some have suggested (Taylor et al., 2011), that under certain circumstances a wise response could involve self-deception, positive illusions, or overconfidence? After all, past research indicates that such biases can be adaptive when used to regulate one's response to negative information in a way that makes the negative information appear less threatening (Taylor & Brown, 1988). By using the situated wise reasoning scale (SWIS), it is now possible to identify conditions under which otherwise wise people would demonstrate psychological bias. It is further possible to explore whether such bias results from motivated reasoning (Kunda, 1990) or involuntary reactivity to concrete situational demands. Given the self-report nature of the current measure, the state-level method could be further bolstered with additional methods, such as utilizing informants' state-specific evaluations of whether a person demonstrates wisdom-related characteristics.

Beyond understanding wise reasoning in particular, the present hybrid method also has a potential to shed new light on the improvement of ecological methods for testing cognition and social phenomena by utilizing the event reconstruction method to improve the accuracy of recall. We suggest that such techniques could be used in future studies to improve the incremental validity of trait-level measurement of many individual differences for understanding and predicting behavior and other-reports (Finnigan & Vazire, 2017).

In MTurk and student samples (Samples A–G and I) we found consistent effects of perceived seriousness of a conflict, and curvilinear effect of participant age, on wise reasoning, effects that were replicated in our Prolific Academic (ProA) sample (Sample J). At the same time, when evaluating the role of sociodemographic factors such as age, ethnicity, or gender to wise reasoning, it is worth pointing out

that some of the observed effects were small in magnitude, requiring adequately powered samples to detect and replicate the role of sociodemographic factors for wise reasoning. Indeed, in the present report, we opted not to evaluate the role of ethnicity in the ProA sample because of underpowered subsamples from some ethnic subpopulations. Similar power considerations likely impacted the minor inconsistencies in sociodemographic effects of participants' age, gender, and gender of the other person involved in the conflict on wise reasoning when comparing the Mturk and (much smaller) ProA samples. Surmising that this lack of replication may have resulted from underpowered tests or sampling error because of the smaller ProA subsamples and greater power necessary to detect quadratic and interaction effects, we suggest that future research conduct more thorough and higher powered tests of the effects of age, gender, gender context, and ethnicity on wise reasoning, as these findings may be important for understanding when and why people increase their use of wise reasoning and how doing so impacts on the outcomes of interpersonal conflicts and relationships in general.

Going beyond the quantitative considerations of adequate power to detect the sociodemographic effects for wise reasoning, it is also worth considering whether the meaning of age-related, gender, educational and ethnic factors across different cultural and situational contexts may moderate their effects on wise reasoning (see Grossmann, in press, Grossmann & Kung, in press, and Grossmann & Huynh, 2013, for related arguments). The latter insight underscores the importance of examining the relationship between social-demographic factors and wisdom-related qualities in the context of how the social-demographic factors are construed by the specific cultural group in a specific situation (Grossmann, 2017). Mixed method approaches combining qualitative studies of intersectionality, and statistical methods quantifying the subjective meaning of relevant sociodemographic factors for wise reasoning may be a useful path forward when attempting to get a fuller understanding of social-demographic considerations for wise thought.

The context-sensitive method is expandable to a range of social domains (e.g., workplace, interpersonal, or intergroup conflict). Moreover, it can be tailored to include a broad range of wisdom-related characteristics in addition to wisdom-related cognitions that we highlight here. On the premise that wisdom is inherently a social process (Baltes & Smith, 2008; Sternberg, 1998), we focused on social conflict situations and the most commonly tested aspects of wisdom-related thought. We found more robust relationships to other measures (nomological network and outcomes) with a single second-order wise reasoning construct (as opposed to any of the individual first-order aspects). However, it remains an open question when or under what contexts other, more unique aspects of wise reasoning or emotion regulation could be expressed and how they contribute to balance versus bias in decision making and making sense of one's social environment. Another fruitful avenue for future research may be to examine other contexts (e.g., legal and political decision-making) and to examine the role of state-specific motivational and neurophysiological processes for wise judgment (also see Grossmann, 2017; Meeks & Jeste, 2009; Staudinger & Glück, 2011).

Conclusion

We introduced the SWIS and revealed that the new measure is reliable and less susceptible to psychological biases (attribution bias, bias blind spot, self-deception, and impression management), compared with global wisdom measures. State-level scores were positively related to indices of living well and to greater balancing of cooperative and self-protective interests, goals (influence vs. adjustment), and causal inferences (internal vs. external) about other people's behavior. In contrast, global wisdom reports were unrelated or negatively related to balance-related indices. We observed a weak-moderate level of within-person consistency in wise reasoning across situations, recommending multistate measurements for a complete understanding of trait-level wisdom. Future research should utilize the new method to examine the benefits of wise reasoning in a broad range of domains and venture beyond cognitive aspects, as the new method is easily modifiable to examine other aspects of wisdom or personality in general.

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Appendix

Situated WIse Reasoning Scale (SWIS)

1. Put myself in the other person's shoes
2. Tried to communicate with the other person what we might have in common
3. Made an effort to take the other person's perspective
4. Took time to get the other person's opinions on the matter before coming to a conclusion
5. Looked for different solutions as the situation evolved
6. Considered alternative solutions as the situation evolved
7. Believed the situation could lead to a number of different outcomes
8. Thought the situation could unfold in many different ways
9. Double-checked whether my opinion on the situation might be incorrect
10. Double-checked whether the other person's opinions might be correct
11. Looked for any extraordinary circumstances before forming my opinion
12. Behaved as if there may be some information to which I did not have access
13. Tried my best to find a way to accommodate both of us
14. Though it may not have been possible, I searched for a solution that could result in both of us being satisfied
15. Considered first whether a compromise was possible in resolving the situation
16. Viewed it as very important that we resolve the situation
17. Tried to anticipate how the conflict might be resolved
18. Wondered what I would think if I was somebody else watching the situation
19. Tried to see the conflict from the point of view of an uninvolved person
20. Asked myself what other people might think or feel if they were watching the conflict
21. Thought about whether an outside person might have a different opinion from mine about the situation

Note: 1–4: Others' perspectives; 5–8: consideration of change and multiple ways situation may unfold; 9–12: intellectual humility/recognition of limits of knowledge; 13–17: search for a compromise/conflict resolution; 18–21: view of the event through the vantage point of an outsider.

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Correction to Brienza et al. (2017)

In the article "Wisdom, Bias, and Balance: Toward a Process-Sensitive Measurement of Wisdom-Related Cognition" by Justin P. Brienza, Franki Y. H. Kung, Henri C. Santos, D. Ramona Bobocel, and Igor Grossmann (*Journal of Personality and Social Psychology*. Advance online publication. September 21, 2017. http://dx.doi.org/10.1037/pspp0000171), the original supplemental has been revised to include a clarifying note to the Tests of model fit over larger sample (Samples C–G) section and post-peer review analyses added to the Post-peer review Factor Analytic Tests section.

All versions of this article have been corrected.

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