



Personality Psychology

Lifespace Patterns of College Students High and Low in Personal Intelligence

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Personal intelligence (PI) refers to the capacity to accurately reason about personality in oneself and other people. We hypothesize that people who are higher in personal intelligence differ from others in their relationships and behaviors. We conducted a series of theoretically-guided studies to examine how PI is associated with a person's self-reported activities, interactions, situations, and group memberships: their *lifespace*. In two archival and three new studies of college students ($Ns = 385, 358, 1186, 416, 696$, respectively) we first identified 15 short, factor-based scales describing aspects of college students' lifespace that are potentially relevant to personal intelligence. Students who scored higher in PI indicated, for example, more positive social interactions including on Interpersonal Communication (e.g., "Listened to a distressed friend"); those who scored lower described more agonistic interactions such as Overt Conflict (e.g., "Got into a fight"). These and additional findings collectively improve our understanding of personal intelligence and of its relationship with the lifespace.

The capacity to reason about personality is a form of intelligence labeled personal intelligence (PI), and measured by posing problems with correct or incorrect answers for people to solve (Mayer, 2008; Mayer et al., 2012). Measures of intelligence correlate with aspects of a person's everyday environment. We use lifespace measures, which include biographical data, behavioral and physical checklists, lists of possessions, social interaction records, and group membership data, to provide a description of how people who are high versus low in personal intelligence vary in key aspects of their lives. This paper reports five studies that test whether people higher in personal intelligence will exhibit distinct life patterns and behaviors (lifespace).

People-centered intelligences, including personal intelligence, assess how well individuals understand themselves and others in the realms of emotional, social, and personal spheres; these intelligences have gradually taken their place alongside more traditional intelligences such as spatial and verbal-propositional intelligences, with which they correlate (V. D. Allen et al., 2014; Conzelmann et al., 2013; Mayer et al., 1990, 1999, 2012; Mayer, Caruso, et al., 2019; Schlegel & Mortillaro, 2019; Walker & Foley, 1973). All, in turn, are subsumed under general intelligence (e.g., McGrew, 2009).

Measuring Personal Intelligence

The Test of Personal Intelligence (TOPI) is an ability-based measure of understanding personality. Items on the test are of a multiple-choice form with correct answers keyed to research in personality psychology. A sample item is:

- If a person is depressed and self-conscious, most likely, they also could be described as:
- calm and even-tempered
 - self-controlled
 - anxious and impulsive
 - fairly thick-skinned (Mayer, Caruso, et al., 2019, p. 2)

The correct answer is "c. anxious and impulsive", keyed to findings from the Big Five (Goldberg & Rosolack, 1994); each item is similarly keyed to research findings in the field.

There already exist well-defined criteria for evaluating the effects of, say, general intelligence; for example, academic achievement (Matarazzo, 1972), occupational prestige, and occupational success (Roberts et al., 2007; Schmidt & Hunter, 2004). By comparison, the set of criteria for evaluating people-centered intelligences is less well understood. Rather, there are a set of suggestive individual findings. For example, evidence to-date indicates that people-centered intelligences correlate with aspects of peoples' relation-

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ships with their friends, relatives, and coworkers (Mayer et al., 2008). In regard to personal intelligence, parents who score higher on an ability measure of PI, relative to parents who score lower, have children who can describe their friend's and relatives' personalities in more meaningful detail (Kenney et al., 2021). People with higher PI engage in fewer counterproductive behaviors at work than those who score lower (Mayer et al., 2018), and they produce more sophisticated descriptions of what they learn about other people (J. L. Allen & Mayer, 2022).

Here, we develop a model and measure of lifespace that can serve as standard criteria for such intelligences by examining the lifespace across several studies. At each stage of the measure's development, we related the outside life criteria to personal intelligence. This process of connecting a theory (personal intelligence) to the direct observed phenomena of the world is a core element of establishing the validity of both the mental ability and the lifespace measures (Cronbach & Meehl, 1955; MacCorquodale & Meehl, 1948).

We believe that personal intelligence impacts multiple areas of people's relationships. "Relationships" covers a lot of ground, to be sure, including social hierarchies, relationship satisfaction, and even whether relationships emphasize exchange versus communal transactions (Buckingham et al., 2019; Gottfredson et al., 2022; Hall & Kiernan, 1992). We therefore qualify it by referring to the lifespace aspects of a person's outer world that might reasonably reflect their understanding of personality. These include, but are not limited to, navigating relationships relatively smoothly with another person, exerting appropriate self-control to complete tasks, and remembering others who are important in one's life. To assess these and similar qualities, we sought a person's self-reported record of ongoing, everyday interactions with others and related areas, creating a Personal Intelligence Lifespace Inventory (PILSI) to assess those aspects of their lives.

The Lifespace and Lifespace-Focused Measures

Kurt Lewin (1936) depicted the person as surrounded by a *lifespace* in which they interacted; Raymond Cattell referred to a life sphere surrounding the individual, from which one could monitor *life data* (Cattell, 1965; Funder, 2016). The lifespace, as used here, can be defined as the "comprehensive environment that surrounds the individual" (Brackett & Mayer, 2007, p. 5; Lewin, 1951; Mayer et al., 1998). Lifespace measures, in turn, have been developed in personality psychology and include measures under that name itself, as well as act frequency scales (Buss & Craik, 1983; Chapman & Goldberg, 2017), and, in organizational psychology, biographical data (Furnham, 2017; Mael, 1991; Mount et al., 2000), as well as overlap with medical and gerontological scales (e.g., a scale called "Life Space" charts people's physical mobility; Stalvey et al., 1999). Such scales describe targeted aspects of people's lives, and in doing so, often increment prediction over and above other measures. At work, for example, employee's biodata (i.e., lifespace) scales correlate in the $r = .14$ to $.28$ with supervisor ratings and increment predictions of workplace suc-

cess over self-judgments and intelligence measures alone (Hunter & Hunter, 1984; Mount et al., 2000; Mumford & Owens, 1987). Lifespace data can be regarded as a fundamental data type in personality psychology (Mayer & Bryan, in press).

A Note on Personal and Emotional Intelligences and Early Lifespace Work in the Area

Sporadic attempts have been made to examine the lifespace of people who are high in personal or emotional intelligences. It is worth noting that these two intelligences correlate at about $r = .70$ (Bryan & Mayer, 2021; Mayer et al., 2012). (All references to intelligence measurement here refer to mental ability measures unless otherwise specified). The two intelligences are somewhat distinct, however: Knowledge of personality differs from that of emotions. Personality is a relatively broad system that arguably includes emotional tendencies such as the positive emotions of Extraversion on the Big Five. In addition to its greater breadth, personal intelligence can possibly be distinguished from emotional intelligence according to the neural networks on which they may draw: Personal intelligence plausibly involves memory stores of trait-related and episodic behavior, whereas emotional intelligence may involve more somatic representations (see for example, Bechara et al., 2000; Clement et al., 2023; Klein et al., 2004). A further discussion of these issues can be found in the accompanying technical supplement (Mayer et al., 2023, Chapter 2).

Although the conceptual distinction between personal and emotional intelligence is relatively clear, the practical reality of their $r = .70$ correlation means that some relations between PI and the lifespace obtained here will likely generalize to lifespace relations with people-centered intelligences more generally.

A Two-Sided Endeavor

Although there exist clear behavioral criteria for general intellectual ability in the form of school achievement and occupational success, there are fewer such benchmarks for people's relationships. Part of our work here is to further develop such a measure. On the one side, we assess personal intelligence with the Test of Personal Intelligence (TOPI); on the other, we examine lifespace measures focused on college students' relationship qualities, related behaviors, and environments. Using this process, we hope to build out evidence for the validity of both the intelligence and lifespace measures (e.g., Cronbach & Meehl, 1955).

Mining the Lifespace Related to Personal Intelligence

Creating a lifespace measure that targets a specific psychological attribute is analogous, in some ways, to sinking shafts at carefully selected points across a terrain to find deposits of valuable minerals (cf. Lubinski, 2000)—the more sunken shafts, the greater the likelihood of a payoff. Here,

Table 1. The Evolution of the Personal Intelligence Lifespace Inventory (PILSI) and Its Areas of Measurement Across Versions

Areas of Measurement and Factor Based Scales	1 st Generation PILSI Versions		2 nd Generation PILSI Versions		
	PILSI 1.0 Study 2	PILSI 1.1 Study 2	PILSI 2 Study 3	PILSI 3 Study 4	PILSI 3R Study 5
	N = 379	Ns = 359	N = 1186	N = 416	N = 696
Physical Sensitivity					
Pain Symptoms	--	--	√	√	√
Skipping Food	--	--	√	√	√
Body Sense	--	--	--	√	√
Adaptive Integration					
Interpersonal Comm.	√	--	√	√	√
Relationship Signifiers	--	√	√	√	√
Companionship ^a	√	√	--	√	√
Critical Evaluation	--	--	√	√	√
Planfulness	√	√	--	√	√
Unintegrated Behavior					
Unreflective Judgments	√	√	√	√	√
Impersonal Identification	√	√	√	√	√
Self-Incuriosity	√	√	--	√	√
Overt Conflict	--	√	√	√	√
Support Groups	--	√	√	√	√
Substance Use	--	√	--	--	√
Academic/Occupational Interest					
Humanities vs. STEM	--	--	√	√	√
Total Number of Scales	6	9	10	14	15

the more questions about the lifespace asked, the more clarity can be gained about how personal intelligence is expressed. Across two archival and three new studies, we develop 15 subscales of lifespace that can serve as indices of a person's life potentially related to personal intelligence.

Overview of the Present Studies

The PILSI was developed across two generations of forms (see [Table 1](#)). The 1st generation scales were composed of items addressing adaptive versus unintegrated behavior and relations with people ([Table 1](#), left). The 2nd generation scales added more items to each of those areas, as well as new items addressing both physical (i.e., body) sensitivity and intellectual activities. The scales were constructed in a step-wise manner adding items that we believed might improve the PILSI's relationship to personal intelligence after each study and removing poorly-functioning items. (The overall scale length across versions was fairly consistent at about 100 items).

In each study, PILSI scales were correlated with a version of the Test of Personal Intelligence (TOPI). We treated the TOPI versions as more-or-less interchangeable given that they typically correlate $r = .85$ to $.95$ with one another (see Mayer, Caruso, et al., 2019; Mayer, Panter, et al., 2019). Study 1 provides an account of the lifespace factors that ap-

peared with some consistency across test forms and studies. We also examined a possible superordinate organization of the scales into three domains. In Studies 2 through 5 we describe the evolution of the PILSI surveys and examine the 10-to-15 scales and their correlates. An open-source version of the final PILSI version, the 3R, is available for those interested in using it (Mayer et al., 2023, Appendix A).

Study 1. The Development of Lifespace Scales for Use Across the Studies

Study 1 concerns the establishment of basic level lifespace scales based on the analyses we employed across the 2nd-generation PILSI forms. The 2nd-generation forms were used because they were more fully developed. We further explain how we arrived ultimately at the PILSI 3R's 15 basic-level scales. A subset of those scales were then fit retroactively to the 1st generation scales. [Table 1](#) indicates the scales in each PILSI version.

We employed a "small factors" approach to our factor analysis of the 2nd generation scales for several reasons. Early on, we noticed that using a few large factors sometimes resulted in a group of items so diverse that some correlated positively and others negatively with personal intelligence (see Mayer et al., 2023, Chapter 4). This suggested that smaller factors existed. We focused on smaller factors

initially because (a) smaller scales were likely stronger predictors of specific outcomes than more global factors, and (b) small factors, relative to the use of individual items, permit reliability estimates of the scales (Revelle et al., 2020). Further, statistical analyses reported in the Results section of Study 1 suggested that smaller factors were both mathematically justified and fit the data best.

Measures and Method

Participants

Study 1 examines data from three studies conducted with the 2nd generation PILSI scales to determine a set of lifespace scales that appeared consistently across them. The three samples involved collectively drew on $N = 2298$ participants, of whom 98.8% were between 18 and 22 years of age, 76.5% were women; 23.5% men, and 92.2% identified as White/Caucasian. The individual samples are described in greater detail in the studies that follow.

Measures: The 2nd Generation PILSI Scales: PILSI 2, 3, and 3R

All lifespace items of the PILSI 2, 3, and 3R scales were judged to refer to life aspects that were concrete, specific, over a specified time period, and answerable with a number or range of numbers; for example, “Over the past week, how many times did you get into an argument with a friend?” (More items are in [Table 2](#)). The 2nd generation scales were guided by the 1st generation scales but included better formulated questions and response options, and items were improved in a step-wise procedure across studies. The three PILSIs’ item content focused on the four broad areas indicated in [Table 1](#): Physical sensations, adaptive behavior, unintegrated behavior, and academic interests. The scales garnered clues about such issues by inquiring as to the person’s (a) physical functioning, (b) settings (e.g., possessions and location), (c) interactions with others (e.g., relationships), and (d) relevant group memberships—four areas central to personality assessment (e.g., Blais & Smith, 2014; Grieger, 2008; Mayer, 2019). Specific items are indicated in [Table 2](#) of the Results section with the complete scales available in the Technical Supplement (Mayer et al., 2023, Appendices).

Study 1 Results

Overview and Purpose

The Study 1 analyses were carried out after the completion of data collection across the three studies of the PILSI 2nd generation scales. We first identified up to 20 factors of the PILSI in each study, and then examined which factors replicated across the PILSI surveys.

Exploratory Factor Analyses (EFA) of the 2nd Generation PILSI Scales

Technical Approach to the Factor Analyses

Exploratory factor analyses were conducted in Mplus 8.1 for the PILSI-2 and 3, and Mplus 8.8 for the PILSI-3R and the parallel analyses (e.g., Muthén & Muthén, 1998–2017). For each analysis, item responses were treated as categorical, and we used a Weighted Least Squares Mean and Variance Adjusted (WLSMV) factor extraction. The extraction was followed by a Crawford Ferguson-Facparsim oblique extraction, which tends to divide large numbers of items more equally across factors relative to alternatives, especially if the data are ordered categories. Where items or item pairs led to Heywood cases (i.e., factor loadings above 1.0), we dropped small numbers of offending items and reran the analyses until no Heywood cases remained. This approach required the removal of 2 PILSI-2 items, 16 PILSI-3 items, and 2 PILSI 3R items.

Number of Factors

The exploratory factor analyses (EFAs) we employed across studies indicated that EFA models beginning at between 12 to 16 factors fit the data well (e.g., RMSEA < .06, CFI and TLI > .95; Hoyle & Panter, 1995; Hu & Bentler, 1999); parallel analyses indicated that for the three studies, the maximum number of factors were near 18, 11, and 14, respectively. These analyses are detailed in the Technical Supplement (Mayer et al., 2023, Chapter 4). We extracted as near to 20 factors as we could, including the surfeit to ensure that, if a factor did replicate across scales, we did not miss it owing to extracting too few a number. Our analyses yielded 19, 18, and 20 factors for the 2, 3, and 3R, respectively. The highest-dimensional solutions sometimes failed to converge or exhibited Heywood cases.

For the PILSI-2, for example, we arrived at a 19-factor solution with a Root Mean Square Error of Approximation (RMSEA) of .011, and Comparative and Tucker-Lewis Fit Indices (CFI and TLI) of .98 and .97, all of which exceeded standard criteria (see Hoyle & Panter, 1995). The estimated correlations among pairs of factors ranged from $r = -.09$ to .28. These results were typical of the PILSI-3 and 3R as well.

Creating the 15 Lifespace Scales

Next, we lay out the factors and their items side-by-side, looking for factors that reoccurred in more than one study. Using this method, we found 10 factors in the PILSI-2 that were shared across all three 2nd generation scales, an additional four factors found in the PILSI-3 and 3R (Studies 4 and 5), and one further factor in the PILSI-3R, which used added items that echoed a finding from the archival 1st generation studies. These 15 scales were composed of from 2 to 5 items each. The factor names, items (sometimes abridged in wording) and item loadings, are reported in [Table 2](#). They ranged in content from Pain Symptoms (e.g., experience chronic pain) to Relationship Signifiers (e.g., digital photos)

to Negative Criticism (e.g., realized someone had a character flaw).

Scale items were converted to z-scores to equally weight them before combining them. Most factors exhibited reliabilities $\alpha > .65$, with a couple in the mid .70s; Factors 2 and 6 hovered near $\alpha = .50$. The scale reliabilities obtained across the three PILSI versions are indicated in [Table 2](#) after the scale names.

How Good is the Fit of a Constrained Factor Analysis (CFA) Employing a Simple Structure Model?

We also fit a confirmatory factor model at the basic scale level allowing for between 10 to 15 factors (as per the given PILSI version). In each case, we applied a simple structure model that allowed each item to load on just its assigned factor, as in [Table 2](#). The models fit quite well across all three studies: the CFA fit the PILSI 3R with an RMSEA of .028, and CFI and TLI of .955 and .949 respectively; the PILSI 2 and 3 fit slightly better. (See the Technical Supplement for details; Mayer et al., 2023, Chapter 4).

Was There a Higher-Order Structure?

We further conducted an EFA of the 10- to 15-factor-based scales for each of the three datasets to see whether a higher-order structure existed. Using a Maximum Likelihood extraction and a GEOMIN rotation we obtained a three-factor solution that replicated across samples and met standard fit criteria for the PILSI-2, but was poorer for the PILSI 3 and 3R. The three factors were Physical Sensitivity, Adaptive Behavior, and Unintegrated Behavior, and the table arrangements used in this paper reflect that higher-order grouping. The complete factor analyses are available in the Technical Supplement (Mayer et al., 2023, Chapter 4). Although the model fit for the PILSI 3R was poor (e.g., CFI and TLI of .899 and .831), a 4-factor version that divided Unintegrated Behavior into problematic behavior either related or unrelated to substance use fit reasonably well (e.g., CFI and TLI of .952 and .900).

Study 1 Discussion

In Study 1, we identified 15 small factors of the lifespace that arose across studies of the three 2nd generation PILSI scales, or among new items introduced in the two last scale versions, and that represented aspects of a student's lifespace potentially relevant to understanding personality. The factor-based scales had between 2 and 5 items each (9 scales with 3 or more items); their median reliability was near $r = .70$ and ranged from .44 to .86. The scales appeared sufficient for the research purposes here, albeit insufficient in some cases for drawing conclusions about any individual's precise life qualities.

Study 2. Reconstructed PILSI Scales in the 1st Generation PILSI Studies and Their Relation to the TOPI and Big Five

We next reanalyzed data from the 1st generation versions of the PILSI scales using the newly obtained basic-level scales. To do this, we reviewed the individual items used in the 1st generation PILSI 1.0 and 1.1 studies and identified those items that were identical, or nearly so, to the items employed in the 2nd generation scales. We then grouped the items according to the factor-based scales delineated in Study 1 ([Table 2](#)) to create backward-compatible versions of as many of the scales as possible.

We next tested the hypotheses that: (a) the PILSI scales will correlate with the TOPI such that scales indicating better interpersonal relationships will correlate positively with the TOPI and those indicating poorer relationships will correlate negatively, that (b) both the PILSI and the TOPI scales will exhibit correlations relatively independent of the Big Five, e.g., correlating less than $r = .30$ with those dimensions, and (c) the lifespace (PILSI) can be used to predict personal intelligence (TOPI) incrementally above the Big Five.

Measures and Method

Participants

The 2012 sample consisted of $N = 385$ college students (52.8% women; 47.2% men; see Mayer et al., 2012, Study 3). The 2014 sample consisted of 358 participants (29% men; 71% women; age = 97% between 18 and 22 years old; 94% White/Caucasian; omitting 25 additional sign-ins with 10% or more missing data). Combined, the two datasets had an $N = 743$, mostly young and white, divided approximately 60% to 40% women to men.

Measures

The TOPI and Big Five. As indicated in the Introduction, all TOPI scales consist of multiple-choice items with one correct answer and three distractors (see the Introduction for a sample item). Respondents in the 2012 sample completed the TOPI 1.2, a 134-item version with an $\alpha = .90$; those in the 2014 sample completed the TOPI MINI-12, a 12-item IRT-informed assessment with an $\alpha = .70$ here (Mayer, Panter, et al., 2019, p. 4). Both sets of respondents completed the Big Five Inventory (BFI, John et al., 1991).

Retrospectively Constructed PILSI Scales. We compared the 15 PILSI scales, which included 48 items altogether, to the earlier PILSI versions. We compared the 1st generation scales item-to-item to the 15 new factor-based scales and were able, for the PILSI 1.0, to match 15 items—6 scales overall. For the PILSI 1.1 we matched 22 items—9 scales overall. Any associations between this relatively small set of PILSI scales and the TOPI, and any incremental predictions they made beyond the Big Five, would provide a stringent test of the efficacy of the lifespace measure.

Table 2. The Fifteen Small Factors Obtained Across Studies 3, 4 and 5 for the PILSI, $N_s = 1186, 416, \text{ and } 696$

Area, with Scale Names and Reliabilities (α) ^a	Factor Loadings		
	PILSI-2	PILSI-3	PILSI-3R
<i>Individual Item (e.g., "How many times did you...")^b</i>			
Physical Sensitivity			
<i>Pain Symptoms</i> $\alpha_s = .66, .66, .66$			
Need to lie down for headache?	.419	.599	.495
A chronic pain you had?	.759	.658	.697
Wonder if you needed to see a doctor about an ailment?	.628	.467	.482
Have trouble sleeping because of physical pain?	.755	.619	.667
<i>Skipping Food</i> $\alpha_s = .51, .50, .47$			
Skip a meal?	.591	.704	.602
Fast all day?	.894	.770	.909
<i>Body Sense</i> $\alpha_s = \text{NSF}, .83, .86$			
Experience tension in your body?	NSF	.884	.751
Try to relax the tension in your muscles or other parts of your body?	NSF	.801	.821
Adaptive Integration			
<i>Interpersonal Communication</i> $\alpha_s = .74, .81, .82$			
Spoke with a distressed friend and listened to their concerns for a few minutes or more.	.510	.682	.709
Let a friend know how much you valued them.	.402	.463	.497
Let someone know who was upset that you had felt that way before too.	.693	NSF	.479
Communicate with a distressed friend and listened to them for a few minutes or more.	.682	.749	.756
<i>Relationship Signifiers</i> $\alpha_s = .79, .78, .72$			
About how many printed and digital photos of friends and family do you have readily accessible?	.648	.613	.561
Letters, lengthy e-mails or written/recorded messages from friends or family that are important?"	.872	.828	.758
Mementos or physical reminders of people close to you?"	.815	.825	.791
<i>Companionship</i> $\alpha_s = \text{NSF}, .71, .65$			
Share a personal, confidential issue of your own with a friend.	NSF	.414	.445
Laugh with a friend.	NSF	.459	.224
Seek advice from a friend.	NSF	.611	.733
Communicate with a friend or relative to ask for advice to improve yourself?	NSF	.455	.532
<i>Critical Evaluation</i> $\alpha_s = .68, .67, .61$			
Describe someone's serious character flaw to a friend or friends.	.635	.755	.845
Realize that someone you knew had a character flaw much worse than you had suspected before.	.602	.655	.669
Spoke badly about someone you observed, but who hadn't done anything bad to you directly.	.318	.454	.320
<i>Planfulness</i> $\alpha_s = \text{NSF}, .69, .75$			
Check or double-check the calendar to make sure you had time left to complete an assignment?	NSF	.604	.651
Carefully check a task you completed and then revised part of it before deciding you were finished?	NSF	.644	.695
Make a plan first thing in the day for what you wanted to accomplish?	NSF	.619	.490
Acknowledge a mistake you had made on a task and corrected it?	NSF	.444	.411
Achieve your goal to get a high grade on an assignment, quiz, or test?	NSF	.256	.396

Unintegrated Behavior			
Unreflective Judgments $\alpha_s = .68, .65, .44$			
Post something on social media that described someone else's personality in some detail.	.449	.411	.284
Turn down a possible roommate for a group living situation and later found out it was the right choice.	.253	.378	.626
Write a poem that described someone else's personality.	.456	--	.504
Write an e-mail that described someone else's personality in some detail.	.515	.677	.235
Change to a different section of a course because your first instructor didn't match your learning approach.	.508	.411	.036
Impersonal Identifications $\alpha_s = .54, .63, .70$			
Read or watch a video about a public figure who serves as a role model for you?	.927	.695	.769
Read or watch a video about a(n) historical figure who serves as a role model for you?	.527	.710	.722
Self-Incuriosity $\alpha_s = \text{NSF}, .46, .58$			
Tell someone that self-knowledge (or self-understanding) is not very important?	NSF	.507	.695
Tell someone that you weren't interested in understanding yourself?	NSF	.183	.710
Overt Conflict^e $\alpha_s = .73, .60, .70$			
Raise your voice because someone wouldn't listen.	.239	NSF ^e	.532
Get into an argument with someone who insulted you or a friend.	NI	NSF ^e	.807
Get into a fight with someone who insulted you or a friend (in person or online).	.775	NSF ^e	.761
Get into a fight with someone to ensure they did something you wanted.	.762	NSF ^e	.387
Get yourself into trouble when you were drunk or high.	.523	NSF ^e	.318
Support Groups $\alpha_s = .63, .70, .72$			
Attend a peer support group for a problem with eating, drugs, alcohol, or gambling?	.799	NA	.960
Attend a support group for a problem that a person close to you experienced (but that you were not directly experiencing at the time)?	.487	NA	.388
Substance Use^c $\alpha_s = \text{NSF}, \text{NSF}, .69$			
Cans of beer and bottles of wine for everyday use?	NSF	NSF	.801
Cans of beer and bottles of wine for use sharing with family and friends?	NSF	NSF	.878
Go to a bar?	NSF	NSF	.507
Academic/Occupational Interest			
Humanities v. STEM $\alpha_s = .69, .74, .69$			
Please select the area below most similar to your college major or expected major: [followed by five alternatives from Mathematics to Theater]	.898	.786 ^d	.817
Please select the area below most similar to your college major or expected major: [followed by five alternatives from Physics to Literature]	.693	.885 ^d	.778

NSF = No such factor appeared; NI = Not included

a. Reliabilities are in order of studies; b. Sometimes abridged with time period specified by item; see technical supplement for full text. c. these three items were either rewritten or newly introduced in the PILSI-3R. d. This factor was reversed in sign to match the directionality of the other two studies. e. These items were included in the PILSI-3 but did not form a factor; the scale was nonetheless computed for the PILSI-3 and scale scores were included in the study analyses.

Study 2 Results

Relation of the Factor-Based Lifespace Scales with the TOPI

The reconstructed 1st generation PILSI scales exhibited correlations of $r > |.15|$ with the TOPI for 10 of 17 values computed, in the directions expected. People with higher TOPI scores exhibited more Adaptive Integration including Relationship Signifiers and Planfulness, with the exception of the Companionship scales, and less Unintegrated Behavior: Lower Overt Conflict, Unreflective Judgment, and Self-Incuriosity, among other relations indicated in [Table 3](#). The

Companionship scales may have failed owing to the over-inclusion of advice-seeking behaviors in the 1st generation scales.

Relation of the Factor-Based Lifespace Scales with the Big Five

[Table 3](#) also shows the correlations between the PILSI scales and the Big Five personality traits. Most of the correlations of the PILSI and the Big Five were between zero and +/- .15. The highest in absolute terms was Overt Conflict, which correlated $r = -.28$ with Agreeableness. Also notable

Table 3. Correlations Between Reconstructed Small Factors^a of the PILSI Scales with the Big Five and TOPI from the 2012 and 2014 Studies^b Using PILSI Versions 1.0 and 1.1, the Big Five, and TOPI Scales (Ns = 379^c and 359^c)

Reconstructed PILSI Scales	Study	No. items	Personal Intell.	Extrav.	Neurot.	Agree.	Conscient.	Openness
Adaptive Integration								
Interpersonal Comm. ^d	2012	3	-.08	-.25	-.06	-.11	.00	-.18
Relationship Signifiers ^e	2014	3	.26***	.12*	.04	.21**	.17**	.10
Companionship ^f	2012	4	-.10*	.20**	.09	.05	-.03	.16***
	2014	4	-.19***	.13*	-.02	-.03	.05	-.01
Planfulness ^f	2012	1	.15**	.13**	.06	.08	.12*	.17***
	2014	1	.09	.05	.04	-.01	.13*	.13*
Unintegrated Behavior								
Unreflective Judgments	2012	3	-.41***	.08*	.05	-.13*	-.18***	.04
	2014	3	-.32***	-.01	-.08	-.04	-.13*	.02
Impersonal Identification	2012	2	-.29***	.11	-.04	-.10	-.13*	.07
	2014	2	-.24***	-.10*	-.05	-.09	-.13*	.14**
Self-Incuriosity	2012	2	-.42***	.12*	.02	-.12*	-.16***	-.03
	2014	2	-.35***	-.01	-.00	-.11*	-.12*	-.08
Overt Conflict ^e	2014	3	-.17***	.07	.04	-.28***	-.18***	-.05
Support Groups ^e	2014	2	-.11*	.05	-.04	-.07	-.05	.02
Substance Use ^e	2014	2	-.08	.20***	-.12*	-.05	-.21***	.02
Test of Personal Intelligence (TOPI)								
TOPI ^h	2012	134	1.00	-.04	-.05	.18***	.21***	.11*
TOPI ^h	2014	12	1.00	.07	.05	.14**	.10***	.12**

Ps .05, **.01, ***.001

a. There were insufficient numbers of items to represent additional small factors for either study; b. (Mayer et al., 2012, 2014); c. Mayer, Panter & Caruso (2012), Study 3, had an overall N of 384 of whom 379 completed the PILSI, TOPI, and BFI; for the Alternate Measures study (Mayer et al., 2014) the comparable figures were N = 383 overall, of whom 359 provided complete data for the scales. d. PILSI 1.0 only; e. PILSI 1.1 only; f. Although this scale was included, there was some drift away from the Companionship quality in the later PILSIs, with more items about requesting feedback here; as such, the retrospective scale construction may have failed; g. The lifespace planfulness scale was represented by just one item in the PILSI 1.0 and 1.1; h. TOPI 1.2 in Mayer, Panter & Caruso (2012) and the TOPI MINI-12 in the Alternate Uses Study (Mayer et al., 2014).

was Companionship with Extraversion ($r = .20$) and (lower) Substance Use $r = -.21$ with Conscientiousness.

The PILSI Incrementally Predicted the TOPI over the Big Five

Next, we regressed the TOPI against the Big Five measures in the PILSI 1.0 and 1.1 samples individually. The TOPI was associated with the Big Five with $R_s = .27$ and $.23$ in the two studies. A second model added in the Lifespace scales after the Big Five. The PILSI 1.0 scales incremented the prediction of the TOPI from $R = .27$ to $.53$ (.51 adjusted for shrinkage), with an $R^2_{change} = .20$, $F(6, 366) = 17.14$, $p < .001$; the same values for the PILSI 1.1 were $R = .23$ for the Big Five, which rose to $R = .50$ (.47 adjusted) with the PILSI scales, with an $R^2_{change} = .20$ (the same across studies), $F(9, 342) = 10.23$, $p < .001$.

Study 2 Discussion

The retroactively-constituted 1st generation PILSI scales exhibited a number of significant correlations with the Test

of Personal Intelligence—mostly in the direction expected, i.e., positive relations with Adaptive area scales (excepting ‘Companionship’ as noted above) and negative relations with Unintegrated Behavior area scales. The PILSI questions ask about the person’s specific behaviors, possessions, and social interactions and the TOPI items ask questions about a test-taker’s knowledge of personality (e.g., which traits go together) scored correct or incorrect. The lack of similarity between the PILSI and TOPI test items makes the study results especially striking. The mental ability of personal intelligence covaries with a person’s lifespace—elements of their daily behavior—in systematic ways: aspects of the lifespace can be used as indicators of personal intelligence.

The PILSI scales also exhibited highly specific relations with individual scales of the Big Five in ways that supported the validity of both measures. For example, the higher a person’s PILSI Overt Conflict scale, the lower their Big Five Agreeableness, $r = -.28$ (the single highest correlation with the Big Five). PILSI Self-Incuriosity, Unreflective Judgments (of others), and Substance Use also related to low Consci-

entiousness, $r_s = -.16$ and $-.12$, $-.18$, and $-.21$. There were few relations with Neuroticism, other than Substance Use ($r = -.12$). Impersonal Identification, which was related to lower personal intelligence, also related to higher Openness, $r = .14$, suggesting perhaps a process of creative exploration of oneself in terms of others.

The distinctiveness of the PILSI as a predictor of the TOPI was hard to miss: Regressing the TOPI against the Big Five led to multiple R s of $.20$ and $.27$ in the 2012 and 2014 studies, in keeping with the TOPI's low relations with the Big Five in other studies (e.g., J. L. Allen & Mayer, 2022; Mayer et al., 2021; Mayer & Skimmyhorn, 2017). Adding in the PILSI scales incremented the predictions dramatically to levels around $R = .50$ for both. In other words, the lifespace scales represent key life features that are related to personal intelligence. We examine these relations further in the next three studies.

Study 3. The TOPI and PILSI-2 with Self-Estimated Personal Intelligence and Social Desirability

In Study 3, our aim was once again to examine the relation between personal intelligence and the lifespace, but this time, to see how participants' responses might be influenced by social desirability and self-estimates of their PI. Self-estimates of intelligence are generally quite inaccurate—chiefly influenced by a person's self-esteem and positive affect more generally (Freund & Kasten, 2012; Joseph et al., 2015; Mayer et al., 2021; Neubauer & Hofer, 2021). For that reason, the measures ought to be relatively independent of the TOPI.

Hypotheses and Exploratory Analyses

We hypothesized that TOPI scores would correlate with factor-based scales of a newly lengthened lifespace inventory (PILSI 2.0). In particular, we expected that the TOPI would correlate positively with lifespace indices of the Adaptive Integration and negatively with indices of Unintegrated Behavior. An example of the latter was the 'Impersonal Identifications' i.e., with historical figures and celebrities. This less-obvious hypothesis was added on the basis of findings from the earlier 1st generation lifespace scales (e.g., Mayer et al., 2012).

We further tested if a global pattern of the PILSI scales would be systematically associated with TOPI scores using both a regression approach as we had before, but also constructing a composite "Attuned-Unintegrated" scale composed of a simple unit-weighted composite of the factor-based PILSI scales with the TOPI.

Lastly, we examined the relations among the PILSI scale, the Test of Personal Intelligence (TOPI), Self-Estimated Personal Intelligence (SEPI), and the Balanced Inventory of Desirable Responding short form (BIDR-16) (Hart et al., 2015). We expected that the TOPI and PILSI would be relatively independent of desirable responding on the BIDR but that self-estimated ability (SEPI) would have a higher relationship. If it were true, the TOPI's and PILSI's indepen-

dence from social desirability would be an importance advantage of those measures.

Measures and Method

Participants

Sample Demographics. The sample consisted of 1,186 college students who completed the survey instruments online using Qualtrics. Participants were 74.4% women and 25.3% men, with .2% using other self-descriptions or missing. Nearly all (99%) were between 18 and 21 years old, and 92.5% identified as White/Caucasian, with the remainder mostly identified as Hispanic/Latinx, Asian, and Black/African American. Participants received one hour of credit toward their course requirement of several hours of research participation.

Data Collection and Screening. Data were collected at the end of the Spring 2019 and during the Fall 2020 semesters. Of the 1,234 initial sign-ins to the survey, we flagged participants for completing fewer than half of the responses ($n = 16$), for being under our clearly stated age limit of 18 years-old ($n = 7$), completing the items in under 2 seconds per item (12); and/or failing half or more of the attention checks ($n = 26$). Any participant with one or more flags was removed, yielding the final sample of $N = 1186$.

Measures

Personal Intelligence Lifespace Inventory, Version 2 (PILSI-2). The PILSI-2 was a further revision of the PILSI 1.0 and 1.1 (see Table 1). This form marked the start of the 2nd-generation scales and was organized by four lifespace areas: biopsychological underpinnings, settings, situations, and groups, as were all 2nd-generation scales. In the *biopsychological* area we asked questions such as how many times over the week respondents "needed to lie down due to a headache?"; for the *settings* area, we asked how many "photo albums or online photo albums" they had; for *situations*, we inquired as to whether they "told a friend how much you valued them," and for *groups*, we asked about the students' majors.

Open-ended numerical responses were then binned according to one of several templates chosen to best represent the distribution of responses. An item with typically low-frequency responses such as the aforementioned "told a friend how much you valued them," used a template with 4 bins from zero to 3 or more times per week; a higher frequency-item such as "photos" above employed an 8-bin template from zero to more than 100 (for more detail, see Mayer et al., 2023, Chapter 7).

Test of Personal Intelligence—MINI-12. The Test of Personal Intelligence—MINI 12 was repeated here from Study 2.

Self-Estimated Personal Intelligence-24. We employed a 24-item measure of Self-Estimated Personal Intelligence (SEPI) to assess people's self-estimates of their understanding of personality; the scale consists of statements such as "I am a good judge of character" and "I know myself" that are answered on a 5-point scale from "Strongly

Disagree” to “Strongly Agree”. The scale exhibited a reliability of $\alpha = .91$ in Study 3.

Balanced Inventory of Desirable Responding (BIDR).

The Balanced Inventory of Desirable Responding is a two-factor scale representing Impression Management (IM) (e.g., “I never cover up mistakes”) and Self-Deceptive Enhancement (SDE) (e.g., “I never regret decisions”). The two scales exhibit slightly distinct measurement properties, with IM varying with degree of anonymity, and SDE predicting overconfidence and overclaiming; the scales’ test-retest reliabilities were reported in the mid .70s (Hart et al., 2015), and in Study 3, the Total, and subscales of IM and SDE had α s = .73, .68 and .69, respectively.

Procedure

Participants logged onto their psychology department’s online research management system, and from there were redirected to a survey on Qualtrics. They first were shown a consent form and, if they agreed, were sent to the survey itself. They then answered a series of demographic questions, the PILSI-2, the TOPI-MINI, the BIDR, and SEPI-24.

Study 3 Results

Did the Empirically Derived Lifespace Scales Correlate in Theoretically-Expected Directions with the TOPI? (Hypothesis 1)

We expected people who scored higher on the Adaptive Integration scales of the PILSI to score higher on the TOPI and those who scored higher on the Unintegrated Behavior scales to score lower. The PILSI scale-to-TOPI correlations are indicated in the “Study 3” column of [Table 4](#). To some extent, these expectations were borne out: The Overt Conflict scale correlated $r = -.20$, $p < .001$ with the TOPI; also replicated was that Relationship Signifiers correlated $r = .05$ with the TOPI, non-significantly, but in the expected direction. We also found the previously obtained relation between Impersonal Identifications and the TOPI, $r = -.09$, $p < .001$ in this study.

Our expectations regarding other lifespace features appeared overly simplistic, however. The Unreflective Judgments (of others) scale correlated $r = -.28$, $p < .001$ with the TOPI whereas the Critical Evaluation scale—which had seemed much the same to us—correlated near zero. We had not known how (attending) Support Groups, which exhibited an $r = -.13$, $p < .01$, would turn out. The PILSI 2 was also the first version to have Physical Sensitivity scales. Pain Symptoms correlated positively with the TOPI, $r = .07$, $p < .05$, as we thought it might. Interests (or at least choice of major) in the humanities versus STEM courses appeared unrelated to PI.

How Well Did the PILSI Scales Collectively Predict the TOPI Scores? (Hypothesis 2)

A Regression Analysis

Factor-based scales are constructed to be somewhat independent of one another; we therefore predicted that,

combined, they would predict the criterion of personal intelligence well.

The 10 scales of the PILSI-2 predicted the TOPI MINI with a multiple $R = .33$, corrected for shrinkage, $p < .001$ and, as such, a bit higher than the best individual scale (Unreflective Judgments, $r = -.28$).

A Linear Composite

We also examined the “Attuned-Unconnected” Index, composed of a sum of the (z-scored) scales with weighted averages of $r \geq .06$ with the TOPI across studies. (The scales at $r = .05$ also were statistically related but seemed to waft downward in their PILSI relations across studies). Neither of the Physical scales met criteria, so in this case, the Adaptive scales and the Unintegrated Behavior scales were summed separately, and the Unintegrated Scales were subtracted from the Adaptive; that is, the equation was (Relationship Significance + Critical Evaluation + Interpersonal Communication) - (Conflict + Impersonal Identification + Unreflective Judgment, + Support Groups). Attunedness predicted TOPI scores $r = .27$, $p < .001$ as also indicated in [Table 4](#).

Ancillary Scales and Analyses

[Table 5](#) shows the relations among the 10 PILSI scales, TOPI, self-estimates of PI (the SEPI) and the Balanced Inventory of Desirable Responding (BIDR). Most of the PILSI scales were independent of the BIDR Total, with 7 of 10 scales at $r \leq |.15|$. The TOPI was similarly independent of desirable responding at $r = -.06$. Actual (TOPI) and self-estimated (SEPI) personal intelligence were unrelated in this study, albeit their correlation has ranged to the mid $r = .20$ s in other work (Mayer et al., 2021). Self-judgments of personal intelligence on the SEPI were, however, highly related to Self-Deceptive Enhancement on the BIDR, at $r = .57$, $p < .001$.

Study 3 Discussion

In Study 3, a number of the PILSI scales correlated with the TOPI. A composite Attuned-Unconnected lifespace scale related to higher personal intelligence and included smoother relationships, keeping more reminders of other people, fewer relationship conflicts, more communication, and similar qualities. These relations appeared largely independent of socially desirable responding. Only self-estimates of personal intelligence on the SEPI (as opposed to actual PI) correlated substantially with social desirability, as high as $r = .57$ with Self Deceptive Enhancement on the BIDR. That is, the more enhanced is one’s self-concept, the higher one’s self-estimated ability—a reason to consider using ability and lifespace measures in research rather than self-estimates (see also Mayer & Bryan, in press).

Study 4. Toward a More Optimal Version of the PILSI Scales

In Study 4 we appraised the replicability of the central findings in Study 3 and added new items to the lifespace

Table 4. Personal Intelligence Lifespace Inventory (PILSI) Scales Correlated with Actual and Self-Estimated Personal Intelligence, Studies 3 to 5 (Ns = 1186, 416 and 696; total = 2298) with Archival Values for Reference

Factor-Based Scale Area and Scale Name	1 st Generat. PILSI (combined) Ns = 379, 359	Personal Intelligence (TOPI) ^e				Self-Est. (SEPI)
		2 nd Generation PILSI Versions			TOPI Weighted Avg. Studies 3-5 ^d	SEPI Weighted Avg. Studies 3-5 ^d
		Study 3 N = 1186	Study 4 N = 416	Study 5 N = 696		
Physical Sensitivity						
Pain Symptoms	NI [NI, NI]	.07** [.01, .13]	.01 [-.09, .11]	.04 [.03, .11]	.05* [.01, .09]	-.14*** [-.19, -.10]
Skipping Food	NI [NI, NI]	.08** [.02, .14]	.08 [-.02, .17]	.01 [-.08, .06]	.06* [.02, .10]	-.12*** [-.16, -.08]
Body Sense	NI [NI, NI]	NI [NI, NI]	.09 [-.01, .18]	.20*** [.13, .27]	.16*** ^g [.10, .22]	-.09*** ^g [-.15, -.03]
Adaptive Integration						
Interpersonal Comm.	-.08 ^a [-.18, .02]	-.01 [-.07, .05]	.16*** [.06, .25]	.14*** [.07, .21]	.07** [.03 to .11]	.05* [.01, .09]
Relationship Signifiers	.26*** ^b [.16, .36]	.05 [-.01, .11]	.13** [.03, .22]	.08* [.01, .15]	.07*** [.03, .11]	.01 [-.03, -.05]
Companionship ^f	-.15*** ^{c,f} [-.22, -.08]	NI [NI, NI]	.04 [-.06, .14]	.06 [-.01, .13]	.05 ^g [-.01 to .11]	.02 ^g [-.04, .08]
Critical Evaluation	NI [NI, NI]	.02 [-.04, .08]	.13* [.03, .22]	.18*** [.11, .25]	.09*** [.05, .13]	-.04 [-.08, .00]
Planfulness	.12*** ^c [.05, .19]	NI [NI, NI]	.24*** [.15, .33]	.16*** [.09, .23]	.19*** ^g [.13, .25]	.17 ^g [.11, .23]
Unintegrated Behavior						
Unreflective Judgments	-.37*** ^c [-.43, -.31]	-.28*** [.33, -.23]	-.27*** [-.36, .00]	-.30*** [-.39, .23]	-.28*** [-.32, -.24]	-.01 [-.03, -.05]
Impersonal Identification	-.27*** ^c [-.31, -.17]	-.09*** [-.15, -.03]	-.12* [-.21, -.02]	-.05 [-.12, .02]	-.08*** [-.12, -.03]	.04 [-.00, .08]
Self-Incuriosity	-.39*** ^c [-.44, -.32]	NI [NI, NI]	-.32*** [-.40, -.23]	-.24*** [-.33, -.17]	-.27*** ^g [-.31, -.23]	-.04 ^g [-.10, .02]
Overt Conflict	-.17*** ^b [-.27, .07]	-.20*** [-.25, -.14]	-.23*** [.32, -.14]	-.19*** [-.26, -.12]	-.20*** [-.24, -.16]	-.05* [-.09, -.01]
Support Groups	-.11*** ^b [.01, .07]	-.13*** [-.19, -.07]	-.23*** [-.32, -.14]	-.15*** [-.22, -.08]	-.15*** [-.19, -.11]	-.05* [-.09, -.01]
Substance Use	-.08 ^b [-.18, .02]	NI [NI, NI]	NI [NI, NI]	-.20*** [-.27, -.13]	-.20*** ^h [-.27, -.13]	-.20 ^h [-.27, -.13]
Interests						
Humanities vs. STEM	NI [NI, NI]	-.01 [-.05, .07]	.00 [-.10, .10]	-.03 [-.10, .04]	-.01 [-.05, .03]	.01 [-.03, .05]
Multiple R, Adjustedⁱ	--	.33***	.48***	.49***	.43***	.24*** ^j
Attuned v. Unconnected	--	.27***	.47***	.46***	.39***	.06*

* $p < .05$, ** $p < .01$, *** $p < .001$; 95% confidence intervals; NI: Not Included

a. the scale was present in the 2014 study only; b. the scale was present in the 2012 study only; c. the scale was present in both the 2012 and 2014 studies and averaged (combined $N = 738$); d. Correlations were converted to Fisher Zs, a weighted average was calculated, then transformed back to an average r ; e. confidence intervals estimated from <http://www.psychometrica.de/correlation.html>; f. although initially we believed we had adequately matched "Companionship" items to the Archival data, we had noted at the time that Companionship in the archival scales consisted chiefly of advice and mentorship seeking, whereas in the 2nd-generation scales, it appeared to tap into more socially equal and pleasant relations (e.g., sharing experiences, laughing together, and spending time). This may account for the discrepant correlation between the archival and new scales. g. Used in Studies 3 and 4 only, $N = 1112$. h. Used in just Study5. i. Adjusted for shrinkage. j. the multiple R for the SEPI appears to include positive affect and confidence as much or more than personal intelligence judging by the beta weights of the individual scales, e.g., low physical sense, high critical evaluation.

measure to expand the 10 scales of the PILSI-2 to 14 in the PILSI-3. To do this, we added lifespace items related to a planful lifestyle because PI shows an often significant correlation of $r = .10$ to $.20$ with Conscientiousness of the Big Five (e.g., Mayer et al., 2012, 2018, 2021). We also included a broader selection of group memberships for better coverage of that area as well as items in several other areas. The hypotheses were as in Study 3.

Measures and Method

Participants

Sample Demographics. The 416 members of the sample were 75.5% women and 23.8% men, with .7% using other self-descriptions or missing. The remaining demographics followed the same pattern as in Study 3 (e.g., mostly be-

Table 5. The 10 PILSI-2 Scales of Study 3 with the Test of Personal Intelligence, Self-Estimated Personal Intelligence, and Balanced Inventory of Desirable Responding (N = 1186)

PILSI Factor-Based Area and Scale		BIDR Short Form (Study 3 only)		Correlation with SEPI Scale
Name	Self-Deceptive Enhancement	Impression Management	BIDR Total	Study 3
Physical Sensitivity				
Pain Symptoms	-.22*** [-.27, -.17]	-.07* [-.13, .01]	-.18*** [-.23, .12]	-.13*** [-.19, -.07]
Skipping Food	-.20*** [-.25, -.14]	.09** [.03, .15]	-.18*** [-.23, .12]	-.06* [-.12, .00]
Adaptive Integration				
Interpersonal Comm.	-.09*** [-.15, -.03]	-.14*** [-.20, -.08]	-.15*** [-.21, .09]	.03 [-.03, .09]
Relationship Signifiers	.04 [-.02, .10]	-.01 [-.07, .05]	-.03 [-.09, .03]	-.08** [-.14, -.02]
Critical Evaluation	-.10*** [-.16, -.04]	-.31*** [-.36, -.26]	-.26 [-.31, -.21]	.02 [-.04, .08]
Unintegrated Behavior				
Unreflective Judgments	-.02 [-.08, .04]	-.03 [-.08, .04]	-.03 [-.09, .03]	.00 [-.06, .06]
Impersonal Identification	.03 [-.03, .09]	.00 [-.06, .06]	.02 [-.04, .08]	.05 [-.01, .11]
Overt Conflict	-.01 [-.07, .05]	-.06* [-.12, .00]	-.04 [-.10, .02]	-.01 [-.07, .05]
Support Groups	-.09*** [-.15, -.03]	-.02 [-.08, .04]	-.07*** [-.13, -.01]	-.03 [-.09, .03]
Interests				
Humanities vs. STEM	-.09** [-.15, -.03]	-.02 [-.08, .04]	-.07** [-.13, -.01]	.00 [-.06, .06]
Personal Intelligence				
TOPI Scale	-.08** [.00, .00]	-.02 [-.08, .04]	-.06* [-.12, .00]	.01 [-.05, .07]
SEPI Scale	.57*** [.53, .61]	.10*** [.04, .16]	.41*** [.36, .46]	1.00 [-, .-]

*p < .05, **p < .01, *** p < .001; 95% confidence intervals

tween 18 and 21 years of age; most identifying as White/Caucasian) and the remainder chiefly Hispanic/Latinx, Asian, and Black/African American; all received course credit for participating.

Data Collection and Screening. Data collection began in March of the 2020 Spring semester and concluded at the semester's end. (We reflect on how the onset of the COVID pandemic may have impacted these results in the General Discussion.) There had been 444 initial logins to the PILSI 3 survey. Using the same screening criteria as in Study 3, we identified a total of 28 participants with one or more flags (e.g., speeding, longstring responding), leaving 416 whose data were a part of the analyses.

Measures

Personal Intelligence Lifespace Inventory, Version 3 (PILSI-3). To revise the PILSI-3 relative to the PILSI-2: (a) we added drop-down menus for each item with each item's drop-down menu based on the templated bin assigned to the item in analyzing the PILSI-2; (b) we removed or rewrote a number of individually non-performing survey items. For example, food questions were removed because they factored along a vegetarian versus a non-restrictive diet that was unlikely to be related to PI in this age group; and (c) we added new lifespace areas that were not fully covered before, including body awareness, planful behavior, and additional group memberships.

Test of Personal Intelligence-39 Extended (TOPI 5E39). The TOPI 5E39 is a 39-item version of the TOPI that was “extended” (the “E”) using item response theory to better assess higher levels of PI than had earlier versions (Mayer, Caruso, et al., 2019). Its reliability in Study 4 was $\alpha = .87$.

Scales Omitted and Not Reported. To reduce the time commitment of our participants, just the TOPI and PILSI were administered, along with the SEPI. The BIDR was not administered in Studies 4 and 5 and the results from the SEPI for Studies 4 and 5 were much the same as in Study 3 and are not reported in detail here but are in the Technical Supplement (Mayer et al., 2023, Chapter 11).

Study 4 Results

More Lifespace Scales

The new PILSI 3 items allowed us to expand the scale to 14 of the 15 lifespace scales. The added scales included Body Sense, Companionship, Planfulness, and Self-Incuriosity. “Self-Incuriosity” had appeared earlier in the 1st generation PILSI forms and was a borderline case in terms of a factor in Study 3 but was clearer in Study 4.

Relations between the PILSI and TOPI

Did the PILSI Scales Individually Correlate with the Test of Personal Intelligence?

As predicted, many of the now 14-in-number individual PILSI scales exhibited correlations with the TOPI in the predicted directions. Relationship Signifiers and Interpersonal Communication correlated $r = .13$, and $.16$, ($ps < .01$ and $.001$), with TOPI scores. Unreflective Judgments, Overt Conflict, and Impersonal Identification correlated $r = -.27$, $-.23$ and $-.12$ ($ps < .001$, $.001$, and $.05$). Two scales made possible by newly added items: Planfulness and Self-Incuriosity, appeared promising as well, with $rs = .24$ and $-.32$ with the TOPI, $ps < .001$.

Could the Multiple Factor Scales of the PILSI be Used to Effectively Predict the TOPI? (Hypothesis 2)

We also regressed the TOPI against the PILSI scales and obtained a multiple $R = .48$, corrected for shrinkage, $p < .001$. The lifespace Attuned-Unconnected index, calculated as unit weights of (Body Sense) + (Relationship Signifiers + Planfulness + Critical Evaluation) – (Conflict + Impersonal Identification + Unreflective Judgment + Self-Incuriosity + Support Groups), was almost as good at $r = .47$, $p < .001$. We will defer further Discussion of Study 4 until the General Discussion.

Study 5. The PILSI 3R

Study 5 represented a further replication and extension, with the only change being the use of a slightly updated PILSI scale, the PILSI-3R. The 3R included added small groups of items to the scales, and further improved the item writing, as described in the Measures section below.

The hypotheses, concerning the relation between the PILSI scales and TOPI were unchanged.

Measures and Method

Participants

Sample Demographics. The 696 participants consisted of 80.7% women and 18.1% men, with 1.1% self-describing in an alternative fashion, or non-responding. Nearly all (98.9%) were between 18 and 21 years old and 92.2% identified as White/Caucasian, with the remainder identified chiefly as Hispanic/Latinx, Asian, and Black/African American. Participants received one hour of participation credit toward their course requirement of research participation.

Data Collection and Screening. Data collection began in October 2020 and concluded at the semester’s end (students attended classes in-person at this time). In total, 715 individuals logged onto the survey. Of these, 19 participants were flagged for signs of extreme inattention or non-compliance using the same procedures as in Studies 3 and 4 to detect non-responders, speeders, longstring responders, and those failing to meet the age requirement or failing the attention checks. All 19 were excluded such that the final sample was $N = 696$.

Measures

Personal Intelligence Lifespace Inventory, Version 3R (PILSI-3R). The PILSI-3R involved a modest revision of the PILSI-3 in which several items were added to the scale, including a further revised item set concerning substance use. Some already-existing items were modified with slight copy editing, and another group of items were modified slightly to reflect new COVID pandemic conditions. For example, an item that asked how many times they had gone “to a bar” was revised as “to buy alcoholic drinks at a store.” A further change modified the instructions of the group membership questions to clarify that even non-members of campus groups should answer all questions to clarify the distinction between true non-memberships and missing data.

The Test of Personal Intelligence-39 Extended (TOPI 5E39) and Self-Estimated Personal Intelligence-16 (SEPI-16). The TOPI 5E39 was repeated from Study 4 to Study 5; the SEPI-16 also was administered, a shorter version of the SEPI-24 reported earlier in the Technical Supplement (Mayer et al., 2023, Chapter 15).

Study 5 Results

Did the Factor-Based Scales Correlate with the Test of Personal Intelligence (TOPI)? (Hypothesis 1)

Study 5 replicated earlier PILSI-to-TOPI relations, now with the 15 final scales. As indicated in [Table 4](#), many of the relations between PILSI scales and the TOPI replicated including further positive correlations in Study 5 for Planfulness at $r = .16$, and Interpersonal Communication at $r = .14$, $ps < .001$ and negative correlations with Unreflective

Judgment, Self-Incuriosity and Overt Conflict at $r = -.30$, $-.24$, and $-.19$, all $ps < .001$. The newly added Substance Use factor also correlated negatively and significantly with the TOPI at $r = -.18$, $p < .001$.

Would the Combined Scales of the PILSI Predict TOPI Scores?

The 15 scales of the PILSI 3R yielded overall regression coefficients of $R = .49$ with the TOPI, after correction for shrinkage. The Attuned-Unconnected index (Body Sense) + (Relationship Signifiers + Planfulness + Critical Evaluation) – (Conflict + Impersonal Identification + Unreflective Judgment + Self-Incuriosity + Support Groups + Substance Use) predicted TOPI scores $r = .46$, $p < .001$. We defer discussion of these findings for now and turn instead to a cross-study analysis of gender differences.

An Examination of Gender Differences in Personal Intelligence and the Lifespace in Studies 3, 4, and 5

Recall that emotional and personal intelligences correlate $r \approx .70$ (Mayer et al., 2012). Brackett et al. (2004) studied emotional intelligence in relation to an earlier-developed omnibus *College Student Lifespace Scale* (not specifically geared to relationships or emotional intelligence) and found that men higher in emotional intelligence exhibited lower drug use and less conflict with others but no effect for women. To check for similar group differences here, we divided the samples of Studies 3 through 5 into self-identified male and female groups (the nonbinary group was too small to draw conclusions from). We then calculated a weighted average of the correlations across studies, separately for the self-identified gender groups. For example, for the Overt Conflict scale, women's scores correlated with the TOPI $r = -.20$, $-.25$, and $-.17$, whereas for men, the values were $r = -.22$, $-.21$ and $-.25$. By converting the r s to Fisher z s, weighting them by sample size and then averaging them, we obtained, in this example, $r_{women} = -.20$ and $r_{men} = -.23$, which were not significantly different even for N s of 1758 and 525. Just three scales exhibited differences in how they correlated across groups: Substance Use, at $r = -.11$ for women versus $-.37$ for men (and echoing the earlier study); Relationship Signifiers, at $r = .07$ for women and $-.02$ for men, and Impersonal Identification at $r = -.03$ for women and $-.19$ for men; $ps < .05$, $.05$ and $.001$, respectively. The other difference found between emotional intelligence and relationship conflict across genders was not obtained here.

The higher correlation between personal intelligence and substance use may be a consequence of men's greater substance use relative to women generally (Center for Behavioral Health Statistics and Quality, 2017; McCabe et al., 2007); here, the men's mean was about a $\frac{1}{2}$ standard deviation higher than women's and the men exhibited twice the variance. Regarding impersonal identification, men read more history books than women (Statista Research Department, 2015) and may further vary in whether, in the low-PI case, they focus exclusively on the individual's roles and accomplishments, versus more on their personalities (cf.,

Massingham, 1920; Mayer, 2018; Su et al., 2009). The correlations for relationship signifiers were both so close to zero that we defer any possible explanation of the difference pending further replication.

General Discussion

People with a greater ability to reason about personality in themselves and others, we believe, are able to navigate aspects of their outer world more effectively than those who lack the ability, particularly those aspects involving relationships with other people. To find out if that was the case, we developed a set of lifespace scales that could detect aspects of a person's behaviors and their created environments that might reflect such mental ability. In essence, we are identifying information by sinking (figurative) shafts into areas of the lifespace, and hoping to return with consequential behaviors and attributes that are indicative of this inner mental ability (e.g., Lubinski, 2000).

A Consideration of Method and Procedures

We developed two 1st generation and three 2nd generation versions of the Personal Intelligence Lifespace Inventory (PILSI), all of which asked respondents diverse questions about their lifespace, including their physical qualities, their physical setting, psychological situations and behaviors, and group memberships.

After the data were collected, we used exploratory factor analysis on the three 2nd-generation scales to identify 18 to 20 small factors that emerged from each study. We then narrowed that group to 15 small factors that replicated either across all three studies (10 scales), or, appeared promising in the later studies (5 scales). As we learned more about the lifespace across our studies, we were able to improve the lifespace scales such that they correlated more highly with the ability-based measure of personal intelligence from 60% of the individual scales (6 in 10) in Study 3, to 64% (9 of 14) in Study 4, to 67% (10 of 15) in Study 5.

Interpretation of Results

Predicting from Personal Intelligence to the Lifespace Versus the Lifespace to Personal Intelligence: A Highly Asymmetrical Relationship

Personal intelligence, assessed by the TOPI, predicts people's lifespace attributes at levels with weighted averages from $r = |.01|$ to $|.28|$. By comparison, aspects of people's lifespace, that is, their PILSI scores, predict personal intelligence scores on the TOPI at $R = .33$ to $.49$. This asymmetrical relationship reflects an intriguing reality: The effects of personal intelligence are distributed across multiple theoretically-relevant areas of a person's life in (mostly) helpful ways: The ability is related to higher adaptive integration and attunement with oneself and other people and reductions in agonistic and unintegrated behaviors. But each relation is individually small or moderate because each part of a person's lifespace is determined by multiple causes. The reverse relationship, by comparison, is quite

different. If one begins with an inventory of a dozen or so aspects of a person's lifespace, it is possible to predict personal intelligence to a substantial degree, e.g., R_s near .45. This is because as the lifespace features are combined, the other (non-PI) determinants wash out leaving a clearer, more distilled, picture of an individual's personal intelligence.

Correlates of Personal Intelligence in the Lifespace

As noted, personal intelligence influenced multiple, distributed aspects of a person's life. Those relationships were largely consistent across studies, as indicated in [Table 4](#)—and they were plainly consistent with the theory of personal intelligence: People who scored high in PI, relative to those who scored low, exhibited more Adaptive Integration with other people, as indicated by their possession of reminders and signifiers of relationships in both their real and virtual living spaces (Relationship Signifiers), they engaged in planful, dutiful behaviors (Planfulness), and exhibited higher positive Interpersonal Communication. By comparison, people lower in PI exhibited more Unintegrated Behavior: They were more apt to raise their voice or get into fights (Overt Conflict) and express a lack of curiosity about themselves and their behavior (Self-Incuriosity). Across studies, these and other PILSI-TOPI correlations fell in the $r = |.10$ to $.25|$ range. Two inconsistencies were noted across studies: the Companionship Scale switched direction between the 1st and 2nd generation scales—a fact we attribute to changes in the items from an emphasis on advice seeking (1st generation) to intimate sharing (2nd generation). Another difference was the decline in the strength of Relationship Signifiers as a predictor between the 1st and 2nd generation scales. This may have reflected the students' (and all our) transition from physical objects (e.g., photographs) to online signifiers such as texts, social media posts, and online images, that arose during the years between the studies, and with which our item phrasing may not have kept up. That said, the scales performed with greater consistency in their later 2nd generation forms.

A further group of scales exhibited relations we had not fully anticipated: Negative Criticism, e.g., of character issues, was *positively* associated with personal intelligence whereas Unreflective Judgments—commenting publicly and sometimes with unwarranted confidence on the personality of other people—was *negatively* associated with personal intelligence. Perhaps accurately identifying faults of oneself and others conveys information that may be unpleasant but nonetheless valuable (cf. Mayer et al., 2015, on the value of receiving feedback). By comparison, judging others publicly with unmerited confidence may reflect an instrumental aim to manipulate others' reputations, a lack of insight, or both. Support Group membership was a sign of lower PI as well. The Substance Use scale (added in Study 5) also correlated negatively with PI suggesting that substance use and support group membership such as in Alcoholics Anonymous may reflect life histories that covary with lesser understanding of personality.

Men who scored higher on the Impersonal Identification scale, i.e., who identified with public figures, historical fig-

ures, and celebrities, also exhibited lower PI across the three 2nd generation PILSI studies but not women. For men it may be that relying on impersonal role models obviates the need to try to match one's inner characteristics to more appropriate and relevant individuals in one's life. We speculated earlier that the difference may be due to men's greater reading of history (Statista Research Department, 2015) and, perhaps, preference toward understanding the historical events relative to the key figures' personalities.

A further group of scales proved minimally or negligibly related to personal intelligence. In the "minimal relation" group were Companionship (e.g., spending time with a friend), Pain Symptoms and Skipping Meals. In the "negligible" category was majoring in humanities, although another study indicated that higher PI students appear to do better in people-focused courses such as literature, philosophy and leadership (Mayer & Skimmyhorn, 2017).

It is worth noting that these patterns were almost fully independent of such commonly studied personality traits as those of the Big Five as well as free from socially-desirable responding. Collectively, the findings contribute to the kinds of small effects that form the foundation of a field of knowledge (cf. Bosco et al., 2015; Funder & Ozer, 2019; Götz et al., 2021).

A Note on the PILSI and SEPI

The PILSI Attuned-Unconnected composite score predicted the TOPI well, but not the SEPI. The regression equations utilizing the individual PILSI scales, however, did predict the SEPI—albeit at a much lower level than they had predicted actual ability (TOPI). Examining the individual PILSI-SEPI scale correlations in [Table 3](#) (and regression betas), the SEPI regression equation relied on the Pain and Skipping Food scales, which captured some negative affect and stress, and the Planfulness scale. This combination of scales appeared to work by reflecting positivity in self-regard as much as any personal intelligence (cf., Mayer et al., 2021).

Limitations and Strengths of the Research

Limits in Comparing Related Broad Intelligences

As noted in the introduction, many of the relations identified here for personal intelligence may be similar for emotional intelligence; one can think of these scales as representing related abilities of people-centered reasoning (Bryan & Mayer, 2021). Both emotional and personal intelligences correlate with lower interpersonal conflict as found on lifespace scales (e.g., Brackett et al., 2004) and other indices (Mayer et al., 2008). Whether personal intelligence's relations to higher levels of Negative Criticism and fewer Unreflective Judgments are the same or different from those of emotional intelligence remains to be seen. Regardless of their uniqueness, these findings advance the understanding and help us appreciate the power of personal intelligence in people's lives.

Limits on the Independence of Lifespace from Desirable Responding

One of the often-stated advantages of lifespace items is that, because they are in principle plainly observable, they are less subject to social desirability bias than self-judgments. Indeed, the 15 PILSI scales were mostly independent of the short form of the Balanced Inventory of Desirable Responding in Study 3. Most of the PILSI 2 scales exhibited near-zero correlations with the BIDR, with just two correlations exceeding an absolute magnitude of $r < |.22|$. That said, it is certainly the case that behavioral scales can be subject to response bias, for example, in underreporting of food intake (e.g., Archer et al., 2013).

Another limitation relates to the challenges of wrangling lifespace scales into clean, clear, factor-based scales. Several of our scales had just two items each; although two-item scales have the advantage over single items of providing a reliability estimate, a true factor scale ought to include more items (e.g., indicators). The ability to successfully increment the two-items scales will need to await future research.

Limits to the Generalizability of Results

Lifespace surveys must somehow reflect the diversity of people's daily life experience. It is challenging to write lifespace items that have the same meaning for someone living in a college dorm room as they would for someone living in their own house, or that would apply equally to school or work. One way to accommodate to this reality is to tailor questionnaires to specific groups such as in college or occupational settings. The drawback to tailored scales is that the research findings are limited to a single demographic, in this case, college students who mostly identified as White/Caucasian, predominantly female (males comprised 20 to 25% of the samples), and between 18 and 21 years of age. We hope, nonetheless, that some of the methodological techniques developed in this work can point the way for other researchers to explore the lifespaces of different groups moving forward, perhaps people at work, guided by our areas of Physical Sensitivity, Adaptive Integration, and Unintegrated Behavior across settings, and that our findings are interesting enough to motivate them to do so.

The results here appeared to be relatively unaffected by the onset of the Covid pandemic. The PILSI 2 data were collected before COVID-19; the PILSI 3 data during remote learning at the university, and the PILSI 3R data after students were substantially back on campus, although hybrid options remained available. The stability of the results likely was due to our rewording several lifespace items to allow for either in-person or remote interactions (see Study 5, Method), but it also may reflect the robustness of certain types of lifespace items over some social conditions.

Conclusions

Across these studies we were able to identify very strong lifespace patterns related to personal intelligence—predicting PI with multiple R s = .33 to .49, Studies 3 to 5. Mapping the lifespace of college students high in PI uncovered a pattern of enhanced interpersonal relationships and thinking about others. There was some indication that high PI individuals are a bit more prone than others to providing critical—but perhaps accurate and complex—feedback to others (e.g., Negative Criticism). Those lower in the ability, by comparison, exhibited increased argumentativeness and conflict. People who learn their level of personal intelligence—and its associated life consequences—may decide if and how much they wish to improve their reasoning in the area. By uncovering such life patterns, we hope to have established a further rationale for why personal intelligence, in particular, and people-centered intelligences more broadly, are important to people's lives.

Competing Interests

None to declare.

Author Contributions

The authors, JDM, DRC and ATP, all participated in the conceptualization of this project. JDM and DRC drafted the lifespace surveys, with input and editing from ATP. JDM conducted the studies and the statistical analyses with input from ATP and DRC. All authors read and edited final drafts of the article.

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Data Accessibility Statement

Deidentified data for the new data presented in this article; that is, for the 2nd-generation PILSI scales, the PILSI 2, 3, and 3R, Studies 1 and 3 through 5, are available on the Open Source Foundation website <https://osf.io/3ea4rs> in an Excel spreadsheet. The first Excel sheet provides file information. It is followed by several sheets containing the item-level data for each PILSI scale, followed by the computed key scored variables of each of three studies. Other sheets include Mplus and SPSS coding.

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Supplementary Materials

Technical Supplement

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