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Digging In: Uncovering the Subtest and Composite Level Flynn Effect on the *Wechsler Adult Intelligence Scale, Fifth Edition*

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Recent research has indicated a decrease in the Flynn effect on the newly released *Wechsler Adult Intelligence Scale, Fifth Edition* (*WAIS-5*), slowing from roughly 3 to 1.2 points per decade. The present study seeks to break down changes in cognitive performance in the WAIS-5 on an index and a subtest-level to better understand how changes in global performance are attributed to alterations in subskills. Validity data obtained during the standardization of the WAIS-5, through counterbalanced design, examined differences between the WAIS-5 and the WAIS-IV (adult sample) and Wechsler Intelligence Scale for Children (WISC-V; 16-year-old sample). Within the adolescent sample ($n = 98$), expected gains were noted in the Fluid Reasoning Index (+3.0) and Processing Speed Index (+2.1). By contrast, slowed growth was noted for the Visual Spatial Index (+0.7), and reverse Flynn effects were observed for the Verbal Comprehension Index (−1.2) and Working Memory Index (−1.8). For adults ($n = 186$), a slowed Flynn effect of about 1 point was noted for all except the higher effect for the Processing Speed Index (+1.7). At the subtest level, for adults, several subtests aligned with expected Flynn effect growth, while the majority were lower, with several subtests demonstrating a reverse Flynn effect: information and block design (both −0.3), symbol span (−1.3), and letter–number sequencing (−1.6). For adolescents, subtests revealed a reverse Flynn effect in several domains, including Letter–Number Sequencing (−2.5), Arithmetic (−2.0), Digits Forward (−1.5), Vocabulary (−1.5), Similarities (−1.0), and Comprehension (−1.0). Implications for understanding the assessment amid an ever-changing world are discussed with future implications for research.

Keywords: Flynn effect; *Wechsler Adult Intelligence Scale, Fifth Edition*; cognitive assessment; intelligence quotient; Wechsler Scales

For just under a century, scholars (Runquist, 1936) have identified a subtle rise in intelligence (as measured by Intelligence Quotient "IQ") on a population basis, a concept investigated empirically by James Flynn (1984, 1987) and formally dubbed the "Flynn effect" by Herrnstein and Murray (1994) in their controversial book *The Bell Curve*. Though a political scientist by training, Flynn's contributions to psychology and education, most notably to intelligence theory, the clinical applications of IQ tests, and forensic psychology, have been profound (Fletcher et al., 2010; Neisser et al., 1996; Pietschnig & Voracek, 2015; Reynolds et al., 2010).

In the United States, the Flynn effect suggests that the population increases in IQ by roughly three IQ points per decade (Pietschnig & Voracek, 2015; Trahan et al., 2014). Due to the Flynn effect, test publishers engage in the standard practice of renorming assessments as often as feasible in order to neutralize the practical consequence of the steady rise in IQ, namely, test norms get out of date at the rate of 3 points per decade in the United States, thereby yielding spuriously high IQs for children and adults. Ideally, renorming will occur every 10 years or so, but in the case of the popular *Wechsler Adult Intelligence Scale, Fifth Edition* (*WAIS-5*; Wechsler, 2024)—the subject of the present study—it was published 16 years after the *WAIS-IV*, a direct consequence of the pandemic.

The Flynn effect, on top of being an interesting phenomenon and guiding standard for the test renorming processes, has grand implications, specifically around the diagnosis of intellectual developmental disability, as well as in life-or-death circumstances for capital punishment cases (Winter et al., 2024). Taken together, understanding the Flynn effect within a modern context is a relevant issue to guide best practices for assessment development, diagnostic processes, and legal operations.

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Rebuttals to Flynn Effect

Some scholars suggest that the Flynn effect is merely a reflection between the difference of latent and observed scores (Jensen, 1998; Rushton & Jensen, 2010). In other words, scores are increasing, but just not the latent construct of intelligence. Jensen (1998) suggested that people are instead becoming increasingly familiar with the assessments, or that modern assessments are perhaps just less rooted in the actual "*g*" construct. Other scholars posit that the work of Flynn requires additional corrections given changes in subtest administration and scoring (Kaufman, 2010), or perhaps reflects measurement invariance (Benson et al., 2015), or a change in observed variability (Rodgers, 1998). In other words, with decreased variance in the lower "tails" of the bell curve and more variability in the upper "tails," such discrepancies may contribute to the Flynn effect findings.

Researchers in France (Gonthier et al., 2021) highlight that the Flynn effect may be merely a reflection of decreased knowledge of culture (G*c*) as opposed to an actual decrease in IQ. Or perhaps the current approach of interpreting the effect may be unintentionally biasing results within the norming process (O'Keefe & Rodgers, 2019). Or in other cases, the Flynn effect may be "built-in" to certain assessment norms (i.e., Peabody Individual Achievement Test–Mathematics; O'Keefe & Rodgers, 2020), having longitudinal effects. Dworak et al. (2023) reported that Rodgers's (1998) work (calling scholars to the needed ten areas of research on the Flynn effect) continued to serve as a model for continued critique of the phenomenon as several unanswered Flynn effect questions persist several decades after his original publication.

Modern Takes on the Flynn Effect

Knowing both the historical relevance of the Flynn effect as well as rebuttals to the theory, the modern perspective on the Flynn effect is admittedly in flux. Recent research suggests that in the United States and other high-income nations, the Flynn effect may be diminishing; the once standard increment in IQ may now be much smaller. Recent research using the most updated measure of intelligence, the WAIS-5, demonstrates that on a full scale level, the Flynn effect may be closer to a rise of 1.2 points per decade, rather than three (Winter et al., 2024). Cross-culturally, scholars in Europe have witnessed a flattening or reverse effect (Bratsberg & Rogeberg, 2018; Dutton & Lynn, 2013; Dutton et al., 2016; Sundet et al., 2004; T. W. Teasdale & Owen, 2005, 2008), although many of these studies admittedly espouse methodological limitations (i.e., proxies for IQ, limited sample size, abbreviated measures of intelligence). Other scholars have suggested that the Flynn effect may not hold true across all cognitive ability levels and may be more pronounced in individuals with high intelligence (Platt et al., 2019). In sum, the impact of the Flynn effect may be changing, perhaps due to society's widespread changes in well-being (e.g., reduction of lead, nutrition, parenting, education; O'Keefe et al., 2023).

Overview of WAIS-5

The newly updated WAIS-5 made its debut in August 2024, which included significant revisions both to subtests and indices. First, looking at the subtest level, the WAIS-5 is composed of 20 subtests: 15 retained from the WAIS-IV, two added from the forthcoming *Wechsler Memory Scale, Fifth Edition* (Wechsler, in press), and three newly developed. The 20 WAIS-5 subtests are grouped into primary and secondary. Primary scales are essential in understanding overall intellectual functioning within core cognitive ability domains, whereas secondary scales can be added to a testing battery to add deeper insights and sampling of intellectual functioning to aid in clinical decision-making. Table 1 lists each subtest and abbreviation and provides a description of what each subtest measures, the derivation of each subtest, and the category.

The WAIS-5 includes 20 possible index scores (5 primary, 15 ancillary). One significant index change was made in the WAIS-5 revision. Previously, the WAIS-IV included the Perceptual Reasoning Index (PRI), which encompassed Block Design, Matrix Reasoning, and Visual Puzzles, which aimed to measure nonverbal reasoning skills. In the updated WAIS-5, the PRI was eliminated and replaced with the Visual–Spatial Index and Fluid Reasoning Index (FRI) to allow for a more targeted and distinct interpretation of nonverbal visual–spatial and fluid reasoning abilities. Table 1 lists each index and abbreviation and provides a description of what each index measures.

Index Level Performance

The Flynn effect has been reported at the subtest and index level in addition to the global level. These findings have been particularly compelling to understand the patterns of cognitive development over time. Colom et al. (2023) conducted a cohort study of university freshmen in 1991 and 2022 using several intelligence measures to understand generational changes in cognitive abilities. Between the two cohorts, tasks relating to abstract reasoning, verbal comprehension, vocabulary, and quantitative reasoning demonstrated cognitive gains, whereas tasks relating to identical figures, verbal meanings, mental rotation, and rote calculation showcased cognitive declines. Zhou et al. (2010) further examined the Flynn effect variability across several Wechsler test batteries (*Wechsler Preschool and Primary Scale of Intelligence* [WPPSI], WISC, and WAIS) and subtests, specifically those relating to visual–spatial and fluid problem solving, because they have been shown to be more sensitive the IQ gain over crystallized measures. The Performance IQ, Perceptual Organization Index, and PRI were examined from versions of the WPPSI (WPPSI-R to WPPSI-III), WISC (WISC-III to WISC-IV), and WAIS (WAIS-R to WAIS-III and WAIS-III to WAIS-IV). Indices included such subtests as Block Design, Object Assembly, Picture Completion, Geometric Design, Matrix Reasoning, and Visual Puzzles. Across all Wechsler scales, each index saw relatively typical Flynn effect gains per year, ranging from +0.2 to +0.3.

In a study of the WISC, Flynn effect subtest gains were examined across three versions of the test from 1972 to 2002 (Kaufman, 2010). Across the nearly 30 years, Similarities demonstrated the highest growth (+3.4 points per decade), with Block Design (+3.2 points per decade), Picture Arrangement (+2.7 points per decade), and Coding (+2.4 points per decade), following close behind. Subtests with the lowest growth were Information (+0.0 points per decade), Arithmetic (+0.2 points per decade), Vocabulary (+0.8 points per decade), and Comprehension (+1.7 points per decade). However, Kaufman (2010) cautioned that subtest gains across generations must be interpreted with caution because some subtest changes (e.g., item style in Similarities, asking for a "second reason why" in Comprehension, and adding "teaching items" in Picture Arrangement)

Table 1
WAIS-5 Index and Subtest Descriptions

Index/subtest	Description
Verbal Comprehension Index (VCI)	VCI includes the SI and VC subtests and measures the examinee's ability to access word knowledge and apply this knowledge through verbal expression.
Similarities (SI)	SI includes 18 items that ask the examinee to describe how an object or concept is similar, which measures crystallized intelligence, verbal concept formation, associate and categorical thinking, and inductive reasoning.
Vocabulary (VC)	VC includes 24 items presented pictorially and verbally, where the examiner is asked to name the object presented or define the word stated orally. VC measures crystallized intelligence, verbal concept formation, and lexical knowledge.
Information (IN)	IN is composed of 24 items that ask the examinee general-knowledge questions that measure crystallized intelligence and factual information commonly acquired through formal instruction.
Comprehension (CO)	CO includes 18 items that ask the examinee to verbally answer questions on their understanding of social situations and general principles. CO measures crystallized intelligence, verbal and conceptual reasoning, use past knowledge, judgment, and pragmatic and social knowledge.
Visual Spatial Index (VSI)	VSI is composed of the BD and VP subtests and measures the examinee's ability to evaluate visual details, visual-motor integration, and the integration and synthesis of whole-part relations.
Block Design (BD)	BD is composed of 14 timed items where the examinee re-creates a model or picture of a design using blocks. BD measures non-verbal reasoning, visual–spatial processing, trial-and-error learning, and the ability to perceive, analyze, and synthesize abstract visual stimuli.
Visual Puzzles (VP)	VP includes 25 timed items where the examinee views a completed puzzle and chooses pieces from an array that together recreate the puzzle.
Fluid Reasoning Index (FRI)	FRI includes the MR and FW subtests and measures the examinee's ability to decipher underlying concepts and relationships among visual objects and use reasoning to figure out and apply rules.
Matrix Reasoning (MR)	MR includes 26 items where the examinee selects a response option to complete a matrix or series, which measures fluid reasoning, simultaneous processing, and induction.
Figure Weights (FW)	FW is composed of 28 timed items where the examinee views a scale with missing weight and selects a response option to keep the scale balanced. FW measures fluid intelligence, quantitative reasoning, induction, and simultaneous processing.
Arithmetic (AR)	AR includes 22 timed items where the examinee solves arithmetic problems mentally. AR measures sequential processing, quantitative reasoning, working memory, mental manipulation, and fluid reasoning.
Set Relations (SR)	SR includes 27 items in which the examinee is shown circles that depict relations and then selects a response option that completes or represents the relations best. SR measures fluid intelligence, simultaneous processing, and deductive reasoning.
Working Memory Index (WMI)	WMI includes the DQ and RD subtests and measures the examinee's ability to register, maintain, and manipulate auditory information consciously.
Digit Sequencing (DQ)	DQ includes 20 trials where the examinee is read a sequence of digits and must then recall the digits in ascending order. DQ measures working memory capacity, sequential processing, and metal manipulation.
Running Digits (RD)	RD is composed of 10 items where the examinee is read a sequence of digits and then recalls a specific number of those digits in the same order. RD measures working memory capacity and attentional focus.
Digits Forward (DF)	DF includes 20 trials where the examinee is read a sequence of digits and is asked to recall them in the same order. DF measures working memory capacity, auditory rehearsal, and registration of information.
Digits Backward (DB)	DB includes 20 trials where the examinee is read a sequence of digits and is asked to repeat the digits backward. DB measures working memory capacity, sequential processing, and mental manipulation.
Symbol Span (SSP)	SSP is composed of 23 items where the examinee a stimulus page of abstract symbol(s) for a designated time and then, on the response page, selects the symbol(s) in the order shown. SSP measures visual-sequencing working memory.
Spatial Addition (SA)	SA includes 23 items where the examinee is sequentially shown two grids with color-coded circles for a specified time and then creates a new grid combining the circles of the previous grids. SA measures visual–spatial working memory.
Letter–Number Sequencing (LN)	LN consists of 20 trials where the examinee is read a sequence of numbers and letters and is asked to recall the numbers in ascending order and then the letters in alphabetical order. LN measures working memory capacity, sequential processing, and mental manipulation.
Processing Speed Index (PSI)	PSI is composed of the CD and SS subtests and measures the examinee's speed and accuracy of visual identification, decision-making, and decision implementation.
Coding (CD)	CD is composed of 135 items where the examinee uses a key to copy symbols paired with numbers within a specific time limit. CD measures processing speed.
Symbol Search (SS)	SS includes 60 items where the examinee scans a search group and indicates when a symbol matches a target group within a specific time limit. SS measures processing speed.
Naming Speed Quantity (NSQ)	NSQ is composed of two teams where the examinee works as fast as possible within a specified time limit to name the number of squares within a series of boxes. NSQ measures subitizing.

Note. Index and subtest descriptions are from the *WAIS-5 Technical and Interpretative Manual* (Wechsler et al., 2024b; pp. 9–15, pp. 21–23). WAIS-5 = *Wechsler Adult Intelligence Scale, Fifth Edition*.

make it questionable whether higher test scores over time reflect growth or changes in administration and scoring.

Platt et al. (2019) reported compelling findings using the *Kaufman Brief Intelligence Test* (Kaufman & Kaufman, 1990). Nonverbal score with 10,0 00+ U.S. adolescents ages 13–18 from 1989 to 2003. In the whole sample, there was no evidence typical of the Flynn effect (+0.09), yet differences in cognitive abilities emerged by age and intellectual ability. Youth aged 13 demonstrated a more typical Flynn effect (+2.3 points); however, youth aged 15 to 18 demonstrated a reversed Flynn effect, with a robust −1.6-point decline at age 18. Furthermore, adolescents with low IQs (≤70) saw a 4.9 point *decrease* per decade with high-scoring adolescents (IQ ≥ 130) seeing a more typical Flynn effect of +3.5 points.

Overall, across age groups, tests, and samples, tasks related to fluid and perceptual reasoning showcased the largest gains, and tasks relating to verbal and conceptual reasoning highlighted decreased gains.

Implications

The findings and discussions surrounding the Flynn effect, particularly at the subtest and composite level on the WAIS-5, carry significant implications for multiple domains, including psychological assessment, clinical diagnosis, educational practices, and legal decision-making. The observed variability in the Flynn effect across current research on subtests and indices underscores the importance of understanding intelligence as a multifaceted construct. For instance, historically, differential subtest gains exist (e.g., higher gains in Similarities and Coding compared with Information and Arithmetic; Colom et al., 2023; Flynn & Weiss, 2007), yet the reported decline of the Flynn effect on the WAIS-5 global score (Winter et al., 2024) may indicate changes to these patterns of abilities.

Statement of Problem

As previously mentioned, test publishers regularly renorm their assessments to provide up-to-date content as well as adjust for Flynn effect related factors. The most recent edition of the WAIS was released in the fall of 2024 (Wechsler et al., 2024a, 2024b), 16 years after its last edition. Given this recent release, it is important for researchers, test developers, and practitioners to understand the contemporary Flynn effect in a robust manner, looking at the impact beyond full scale interpretation to consider the impact of the effect on both composite and subtest-level performance. Specifically, given the decrease in the Flynn effect demonstrated in the WAIS-5 on the Full Scale IQ (Winter et al., 2024), it is key to understand where specifically these changes are occurring within the profile of the array of cognitive abilities that are assessed by the full scale. These questions loom especially important for the adolescent group in our study, whose high school education was suddenly interrupted and compromised by the pandemic.

Given the present state of the literature on the reduction, or "slowing," of the Flynn effect on the Full Scale IQ level, the present study seeks to understand the patterns of the Flynn effect on WAIS-5 indices and subtest scores for (a) the adult population and (b) 16-year-olds.

Materials and Method

Participants

Data from two validation samples, assessed in 2023 during the WAIS-5 standardization (post the COVID-19 pandemic), reported in the *Technical and Interpretive Manual* (Wechsler et al., 2024b, Table 5.3), were analyzed for this study.

Within the WAIS-IV to WAIS-5 first comparison study, 186 people aged 16 to 90 ($M_{age} = 47.8$) participated. Of the participants, 65.1% identified as female. For ethnicity, the group was such as 15.6% African American, 10.2% Asian, 22.0% Hispanic, 43.0% White, and 9.1% other. For education, 16.6% had less than 12 years of schooling, 23.7% were high school graduates, 23.1% had some college education, and 37.6% were college graduates.

For the second study, comparing the WISC-V to WAIS-5, there were 98 16-year-old adolescents ($M_{age} = 16.4$), with 60.2% identifying as female. For ethnicity, the following data were noted via self-report: 11.2% African American, 3.1% Asian, 23.7% Hispanic, 50.0% White, and 2.0% other. For this sample, parental education was collected: 21.4% had less than 12 years of schooling, 18.4% were high school graduates, 26.5% had some college education, and 33.7% were college graduates.

Procedure

The first counterbalanced study was conducted to assess individuals ages 16 to 90 years on both the WAIS-IV (Wechsler, 2008) and the WAIS-5 (Wechsler et al., 2024a, 2024b). The time interval between the first and second administration ranged from 7 to 134 days ($M = 28.2$; Wechsler et al., 2024b, pp. 82–89). The second counterbalanced study compared the WISC-V (Wechsler, 2014) and the WAIS-5 (Wechsler et al., 2024a, 2024b), with a time interval between the first and second assessment ranging from 1 to 112 days ($M = 26.9$)

Instrument

The newest edition of the WAIS (Wechsler et al., 2024a, 2024b) underwent the standardization process from February 2023 until January 2024. During this norming process, 2,020 examinees (aged 16–90) participated, with 180 people per age band between ages 16 to 69 and 100 for each age band for individuals 70–90 years. Data matched the 2022 census data, stratified by various demographic factors, including age, sex, ethnicity, education level, and geographic region (Ruggles et al., 2023). For sex, please note that 16 participants indicated that their gender was distinct from sex ($n = 6$ female for sex and indicated man for gender; $n = 5$ male for sex and indicated woman for gender; $n = 4$ gender as nonbinary; $n = 1$ genderqueer).

The updated WAIS-5 provides 20 subtests on a five-factor model (i.e., verbal comprehension, visual–spatial, fluid reasoning, working memory, processing speed), providing global scores of Full Scale IQ, a Nonverbal Index, Nonmotor Index, and General Ability Index. The mean reliability for Full Scale measure had an average of .97 across age ranges, with a stability coefficient identified as .93 across 201 individuals from ages 16–90 who were assessed twice (M interval = 29 days).

Correlations between primary indexes of the same name in the WAIS-5/WISC-V counterbalanced study were substantial, ranging from .73 (Working Memory Index [WMI]) to .90 (Processing Speed Index [PSI]) with a mean coefficient of .83. In the WAIS-5/WAIS-IV counterbalanced study values ranged from .72 (WMI) to .88 (Verbal Comprehension Index [VCI]) with a mean of .80. These alternate-form reliability coefficients for the Indexes under study in this investigation are high enough to conclude that they are measuring the same constructs across test batteries.

Results

Table 2 showcases the findings of the present study at the index level of comparison. For adults (i.e., WAIS-IV to WAIS-5), at the index level, across all indices, findings were below the traditional, expected gain of three points per decade. Specifically, VSI and WMI experienced the smallest growth (+1.0 points per decade), followed by the VCI, FRI-PRI (+1.2 points), and the PSI (+1.7 points). For the adolescent group (16-year-olds), the pattern of gain and loss was more striking. Specifically, this age group saw a traditional Flynn effect on the FRI (+3.0), with smaller changes noted for the PSI (+2.1). These findings are more aligned with the growth of 2.6–2.8 points per decade identified in the WAIS-III versus WAIS-IV analyses (Wechsler, 2008), and the 3 points per decade noted in meta-analytic research (Pietschnig & Voracek, 2015; Trahan et al., 2014). Unexpectedly, smaller gains were noted for the VSI (+0.7), and a reverse Flynn effect was seen for the VCI (−1.2) and the WMI (−1.8).

Table 3 and Figure 1 highlight the results at the subtest level. At the adult age group, the Similarities subtest appeared to align with typical Flynn effect related growth (+2.8), closely followed by Figure Weights (+2.5), Symbol Search (+2.5), and Matrix Reasoning (+2.2). However, the remainder of subtests demonstrated growth that was much lower than expected (see Table 3). Highlighting exceptional outliers, the Arithmetic and Digits Backwards subtests demonstrated no growth (+0.0), with four subtests displaying substantial decreases in performance, specifically Information and Block Design (both −0.3), Symbol Span (−1.3), and Letter-Number Sequencing (−1.6). For the 16-year-old age group, consistent with prior Flynn effect findings, 16-year-old adolescents demonstrated typical growth in Digits Backwards (+3.0). On the contrary, decreased performance was noted across the rest of the subtests (see Table 3), most prominently displayed in Letter–Number Sequencing (−2.5), Arithmetic (−2.0), Digits Forward (−1.5), Vocabulary (−1.5), Similarities (−1.0), Comprehension (−1.0), and Information (+0.0). Interestingly, the size of the effects across the adult sample battery (i.e., WAIS-IV and WIAS-V) and adolescent sample battery (i.e., WAIS-V and WISC-V) are not highly correlated (r = .27), which is illustrated in Figure 1. This indicates that factors driving subtest level Flynn effects in one sample are different from what is driving the subtest level effects in the other.

Discussion

Winter et al. (2024) identified a reduced Flynn effect for Full Scale IQ of 1.2 IQ points per decade based on the same data sets used in the present study, and the results were identical for the adult sample, ages 16–90 years, tested on two versions of the WAIS, and the 16-year-old sample tested on the WISC-V and WAIS-5. However, the results of the present study reveal that the striking similarity in the results for Full Scale IQ masks notable differences in the Flynn effect for adults versus adolescents.

Findings for the Adult Sample

For the heterogeneous adult sample, reduced Flynn effects were observed for all five indices, and they were quite consistent with the Full Scale value of 1.2. Four of the five indexes yielded Flynn effects of 1.0–1.2, and the 1.7 Flynn effect for PSI was still notably lower than the anticipated 3 points. In essence, the reduced Flynn effect for the adult population occurred about equally in every major domain measured by the WAIS-5 (see Table 2). Subtest variability for the adult sample is a bit more pronounced than index variability, but a great majority of subtests displayed Flynn effects within the relatively narrow range of −1.3 to +1.3 (see Table 3). It is interesting that the four subtests with Flynn effects greater than +2.0 emphasize fluid reasoning (even Similarities has a G*f* component), which is consistent with a bulk of research in support of higher Flynn effects for fluid than crystallized scales (Pietschnig & Voracek, 2015; Trahan et al., 2014). Indeed, the two subtests that comprise the WAIS-5 FRI—Figure Weights and Matrix Reasoning—had Flynn effects that averaged 2.4. Even though there is no comparable fluid scale on the WAIS-IV (only the amalgam of fluid and visual spatial), it is a fair interpretation of our results to say that the decrease in Flynn effect for the adult population does *not* apply to the CHC broad ability of *Gf*, which remains fairly robust over time. And the emergence of Similarities as the WAIS-5 subtest with the largest Flynn effect for the adult sample (+2.8) is notable because of the consistent role that this task has played in Flynn's (2009) theorizing about the effect named after him. Flynn and Weiss (2007), for example, emphasized that Similarities is a unique subtest in that it does not merely require the respondent to recall concrete facts; it requires abstract reasoning skills that highlight a more "scientific," or problem-solving, way of conceptualizing responses.

Table 2
Flynn Effects for WAIS-5 Primary Indexes Based on Two Counterbalanced Validity Studies With the WAIS-5

	WAIS-5/WAIS-IV (N = 186)			WAIS-5/WISC-V (N = 98)		
Index	WAIS-5	WAIS-IV	Flynn effect [95%CI]	WAIS-5	WISC-V	Flynn effect [95% CI]
Processing Speed Index	100.7	103.4	+1.7 [0.85, 2.52]	100.0	102.1	+2.1 [0.68, 3.52]
Verbal Comprehension Index	99.0	100.9	+1.2 [0.52, 1.85]	97.6	96.4	−1.2 [−2.56, 0.16]
Fluid Reasoning Index–Perceptual Reasoning Index	99.9	101.8	+1.2 [0.29, 2.08]	99.3	102.3	+3.0 [1.07, 4.92]
Visual Spatial Index–Perceptual Reasoning Index	100.2	101.8	+1.0 [0.12, 1.88]	100.6	101.3	+0.7 [−0.8, 2.19]
Working Memory Index	97.5	99.1	+1.0 [0.03, 1.97]	102.1	100.3	−1.8 [−3.90, 0.30]

Note. Indices are listed in order of the magnitude of their Flynn effects on the WAIS-5/WAIS-IV counterbalanced validity study. Data are from the *WAIS-5 Technical and Interpretative Manual* (Wechsler et al., 2024b; p. 85, 88). CI = confidence interval; WAIS-5 = *Wechsler Adult Intelligence Scale, Fifth Edition*; WISC = Wechsler Intelligence Scale for Children.

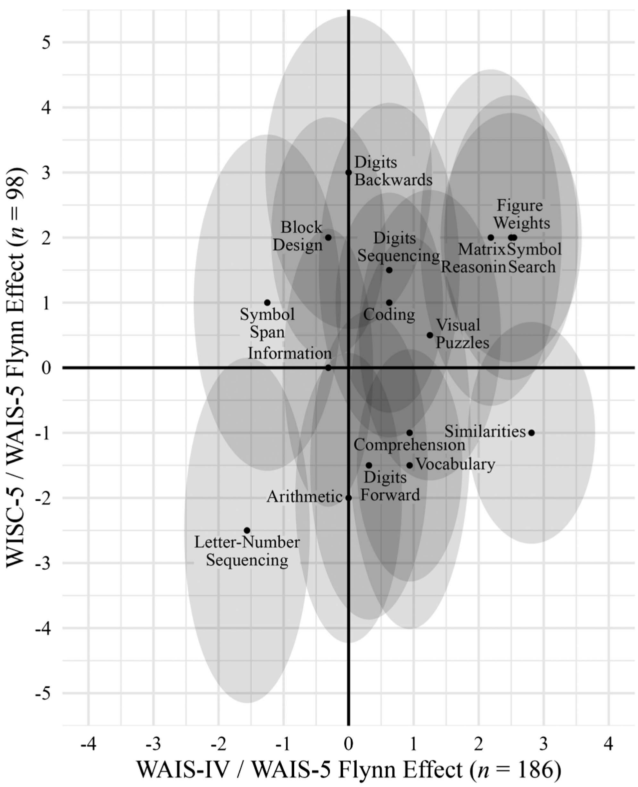
Table 3
Flynn Effects for WAIS-5 Subtests Based on Two Counterbalanced Validity Studies With the WAIS-5

	WAIS-5/WAIS-IV (*N* = 186)			WAIS-5/WISC-V (N = 98)		
Subtest scale	WAIS-5 standard score	WAIS-IV standard score	Flynn effect [95% CI]	WAIS-5 standard score	WISC-V standard score	Flynn effect [95% CI]
Similarities	98.5	103.0	+2.8 [1.83, 2.81]	97.5	96.5	−1.0 [−2.7, 0.7]
Figure Weights	99.5	103.5	+2.5 [1.47, 3.53]	99.5	101.5	+2.0 [−0.19, 4.19]
Symbol Search	99.5	103.5	+2.5 [1.42, 3.58]	101.0	103.0	+2.0 [−0.39, 4.39]
Matrix Reasoning	100.0	103.5	+2.2 [1.1, 3.28]	100.0	102.0	+2.0 [−0.58, 4.58]
Visual Puzzles	100.0	102.0	+1.3 [0.16, 2.34]	100.5	101.0	+0.5 [−1.73, 2.73]
Vocabulary	99.5	101.0	+0.9 [0.13, 0.93]	98.0	96.5	−1.5 [−3.28, 0.28]
Comprehension	100.0	101.5	+0.9 [0, 1.88]	99.5	98.5	−1.0 [−4.02, 2.02]
Digits Sequencing (DQ–DSs)	98.0	99.0	+0.6 [−0.46, 1.71]	101.5	103.0	+1.5 [−1.07, 4.07]
Coding	101.5	102.5	+0.6 [−0.20, 1.45]	99.5	100.5	+1.0 [−0.69, 2.69]
Digits Forward (DF–DSf)	98.5	99.0	+0.3 [−0.6, 1.22]	101.5	100.0	−1.5 [−3.87, 0.87]
Block Design No Time Bonus	100.5	101.0	+0.3 [−0.64, 1.27]	100.5	102.5	+2.0 [−0.28, 4.28]
Arithmetic	99.5	99.5	0.0 [−0.82, 0.82]	99.5	97.5	−2.0 [−4.23, 0.23]
Digits Backwards (DB–DSb)	100.5	100.5	0.0 [−1.28, 1.28]	98.5	101.5	+3.0 [0.6, 5.41]
Information	99.5	99.0	−0.3 [−1.0, 0.38]	97.5	97.5	0.0 [−2.14, 2.14]
Block Design	100.5	100.0	−0.3 [−1.19, 0.57]	100.0	102.0	+2.0 [0.15, 3.85]
Symbol Span (SSP–SSP-PS)	101.5	99.5	−1.3 [−2.38, −0.12]	97.0	98.0	+1.0 [−1.58, 3.58]
Letter–Number Sequencing	101.0	98.5	−1.6 [−2.56, −0.6]	100.0	97.5	−2.5 [−5.15, 0.15]

Note. Subtests are listed in order of the magnitude of their Flynn effects on the WAIS-5/WAIS-IV counterbalanced validity study. New WAIS-5 subtests are excluded from the table because Flynn effects could not be computed for these tasks. Data are from the *WAIS-5 Technical and Interpretative Manual* (Wechsler et al., 2024b; p. 85, 88). Flynn effects for the subtests are presented in standard score units rather than scaled score units for ease of interpretation and to permit direct comparisons with Flynn effects for the scales. CI = confidence interval; WAIS-5 = *Wechsler Adult Intelligence Scale, Fifth Edition*; WISC = Wechsler Intelligence Scale for Children; DQ = Digit Sequencing; DSs = Digit Span Sequencing; DSf = Digits Sequencing forward; DSb = Digits Sequencing backward; SSP = Symbol Span; PS = Picture Span.

Figure 1

Flynn Effect Comparisons for WAIS-5/WAIS-IV Sample and WAIS-5/WISC-V Sample



Note. WAIS-5 = *Wechsler Adult Intelligence Scale, Fifth Edition*; WISC = Wechsler Intelligence Scale for Children.

Findings for the 16-Year-Old Sample

In contrast to the adult sample, Flynn effects vary widely from index to index for the 16-year-old sample, ranging from −1.8 for WMI to +3.0 for FRI/PRI (see Table 2). Interestingly, the results can be interpreted from the vantage point of Wechsler's original Verbal-Performance dichotomy on earlier versions of his scales—the positive Flynn effects are associated with indices that were all aspects of Performance IQ whereas the two indexes with negative Flynn effects (VCI, WMI) were components of Verbal IQ. Once again, that distinction is consistent with the traditional finding of larger Flynn effects for fluid and nonverbal scales versus crystallized, language-oriented scales. Table 3 continues that narrative by studying Flynn effects for the separate subtests in the study of 16-year-olds. Of the six tasks with Flynn effects of +2.0 or greater, five require nonverbal problem solving or processing speed (Matrix Reasoning, Figure Weights, Symbol Search, and Block Design, both with and without bonus points). The highest Flynn effect of +3.0 was on Digit Backwards, but that finding was totally neutralized by the extreme negative Flynn Effect of −2.5 for Letter–Number Sequencing; both are working memory tasks and neither is included on a primary WAIS-5 scale.

Adolescent results in the present study reveal compelling implications, opening up additional questions to make sense of such findings. Historically, intelligence gains for youth have been relatively stable, with increases of approximately 3 points per decade (Flynn & Weiss, 2007), evidencing gains slowing in more recent years for 18- to 20-year-olds (Bratsberg & Rogeberg, 2018; Dutton & Lynn, 2013; Dutton et al., 2016; Platt et al., 2019; Sundet et al., 2004; T. W. Teasdale & Owen, 2005, 2008). However, we are not just witnessing a slowing of the Flynn effect for adolescents; we are seeing dramatic reversals in several subtests. Intelligence test scores have been hypothesized to elucidate what is happening in American classrooms and changes in the real world (Flynn & Weiss, 2007). It is notable that Similarities—despite producing the highest Flynn effect in the heterogeneous adult sample—yielded a negative Flynn effect (−1.0) for the 16-year-olds. Though Flynn has continually emphasized its fluid reasoning aspect, the fact is that this subtest has a strong verbal component and is primarily a measure of crystallized knowledge, as attested by the results of exploratory and confirmatory factor analysis on a wide array of children and adults (Kaufman et al., 2016; Lichtenberger & Kaufman, 2013; Wechsler et al., 2024b). And for the adolescent sample in our study, Similarities clearly behaved as a crystallized test, not a fluid test, as its Flynn effect aligned with negative Flynn effects for Vocabulary (−1.5) and Comprehension (−1.0); despite the maintenance of fluid abilities in both the adult and adolescent samples in our study, we are seeing a decline in understanding of general principles and knowledge. This decline is also reflected in the Arithmetic Flynn effect (−2.0). Like Similarities, Arithmetic is designed to examine more complex reasoning skills beyond mere computations, such as working memory and abstract fluid reasoning skills. As Flynn and Weiss (2007) noted, these are skills that "are modeled by contemporary formal education" (p. 218). Working memory abilities have also diminished for 16-year-olds (−1.8 points). Working memory plays a critical role in academic skills, such as reading comprehension (Peng et al., 2018) and mathematics (Raghubar et al., 2010) and can be greatly influenced by attentional control (Awh et al., 2006). Overall, the reverse Flynn effects for Similarities, Vocabulary, Comprehension, and Arithmetic at age 16—when coupled with greatly reduced Flynn effects within the heterogeneous adult sample on Information (−0.3), Arithmetic (0.0), Comprehension (+1.0), and Vocabulary (+1.0)—point to a stagnation in the acquisition of cultural knowledge. As noted, some researchers suggest that the reverse Flynn effect findings may be, in fact, partly due to loss of cultural knowledge or crystalized intelligence (Dutton & Lynn, 2013; Gonthier et al., 2021).

To illustrate the intelligence and school connection, The Nation's Report Card (National Center for Education Statistics, 2025) shared recent results of the National Assessment of Educational Progress assessment results that mirror IQ findings. The 2024 testing data revealed continued decreases in reading (5 points since 2019 for eighth graders), a decline that was present for American students prior to the pandemic. Furthermore, 33% of eighth-grade students were reading at or below the National Assessment of Educational Progress's basic reading level, the largest number of students in the assessment's history. Some gains have been reported in mathematics for fourth-grade students (2 points since 2022). However, these gains have been attributed to high-performing students bringing the national average up and masking the experience of struggling students. Scores for eighth-grade students continue to decline, dropping 8 points since 2019. Achievement gaps continue to widen across both reading and math, with lower-performing students demonstrating continued declines in academic performance or not showing progress.

Yet, why are we seeing such a decline in performance for this population of adolescents? Here, we move into some speculation, but important considerations, nonetheless. Undoubtedly, the pandemic has taken a toll on our adolescent population. This group of 16-year-olds would have been 13 years old at the start of the pandemic. Extended school closures, hybrid learning, and social distancing were just a few of the consequences disrupting the school and social lives of students. Though declines for students did not start with the pandemic, evidence has shown it has exacerbated learning deficits and mental health (Mazrekaj & De Witte, 2024). During this time, screen time increased significantly. Shoshani and Kor (2024) documented longitudinal changes in screen time (e.g., internet/television, video game, social media use) usage prepandemic and postpandemic, with adolescent screen time increasing from 7.43 hr a day in 2019 to 8.53 hr in 2022. In a 2024 study by the Pew Research Center (2024), nearly 50% of adolescents ages 13 to 17 report being online "almost constantly," with 95% having access to a smartphone. Cell phone use remains a problem for schools across the country, with teachers observing the impact phones have on distracting students and disrupting learning (Walker, 2024). National Center for Education Statistics (2025) recently reported that 26% of public schools had reported a significant impact on educator morale due to student lack of focus and inattention and that 30% of public schools reported cyberbullying incidents at least once per week. Research provides further evidence of the impact of social media usage on attention and learning. Kokoç (2021) examined how multitasking with social media during homework or studying impacted cognitive abilities, finding that multitasking adolescents had diminished academic performance, which was related to low attentional control.

Haidt (2024) has shared the broad impact of social media usage not only on academics but on mental health as well. His research also advocates for school districts to implement cell phone ban policies to mitigate these impacts. Importantly, Haidt (2024) documented the trends of technology and social media usage well before the pandemic, tracing the roots of these challenges to the early 2010s with the advent of the front face camera on smartphones. From then, we have seen global impacts on academics, mental health, sleep, exercise, and social time. See Haidt (2024) for a thorough review. Therefore, it perhaps should not be a surprise to see such stark declines in areas of cognitive functioning such as working memory and verbal comprehension. Coincidently, each of these challenges has also emerged within the time period from when the WAIS-IV and WAIS-5 were released in 2008 and 2024, respectively.

Adults and Adolescents: Common Themes Tied Together

Across adult age groups and in one small group of adolescents aged 16 years old, lower than expected Flynn effects were observed in several indices and subtests. Interesting as the findings may be, we are (in line with other scholars in the field), uncertain as to why these changes have occurred. Flynn (2009) himself warned that the Flynn effect was likely not permanent and that, with time, he proposed that the Flynn effect would diminish. Thus, perhaps we, as a society, have "maxed out" on the benefits of modern cognitive growth, with the reduction of lead in people's living spaces, improved education and parenting styles, or enhanced nutrition, to name a few of the many proposed environmental reasons for the effect (O'Keefe et al., 2023).

However, the present findings do not just suggest the Flynn effect is slowing, but in some cases, there is a reverse Flynn effect. Is the slowing and reversals a product of the expectation proposed by Flynn himself of the eventual diminishing effects (Flynn, 2009), or rather a sign of something larger happening at a societal level? These reductions and slowing findings have been observed in the literature (Bratsberg & Rogeberg, 2018; Dutton & Lynn, 2013; Dutton et al., 2016; Platt et al., 2019; Sundet et al., 2004; T. W. Teasdale & Owen, 2005, 2008), so they are not new. But, are they perhaps aggravated by societal factors, potentially a worldwide pandemic, social media, technology, or artificial intelligence, all of which have been (relatively speaking), more recently introduced into our world, with preliminary research suggesting a multitude of negative effects on the human brain and mental health (Haidt, 2024), impacting young people, unlike anything other generations have witnessed before (Twenge, 2023)? And, how are adults and adolescents being impacted differently, as uncovered by a weak correlation ($r = .27$) in the present study? With so many questions remaining, Reynolds and Kaufman's (1990) statement still rings true, "Conventional intelligence tests and even the entire concept of intelligence testing are perennially the focus of considerable controversy and strong emotion."

Limitations

Several limitations exist in this project. First, the findings apply directly to older adolescents and adults, as the WAIS-5 includes only individuals ages 16 and older. Thus, the implications of these findings on children and younger adolescents are limited to the upper edges of adolescence (ages 16–18). As Platt et al. (2019) observed with their sample of 10,000+ adolescents, Flynn effects differed significantly and substantially for each year of age within the narrow range of 13–18 years. This is critical to note and consider for future research with the updated WISC-6 slotted for publication in the coming year.

Methodologically, a limitation also includes counterbalanced design, which may be impacted by the practice effects (i.e., whichever assessment is delivered second may be impacted by the administration of the first assessment). It is important to note that the test publisher accounted for these concerns to statistically correct for this issue, adhering to best practice (Wechsler et al., 2024b), and it is still important to acknowledge the inherent methodological constraint.

Furthermore, despite the strength of the counterbalanced design, there were relatively small sample sizes of less than 200 participants for one study and less than 100 for the other. As the Flynn effect seeks to make comparisons on a population level, it is important to consider the strength of the design while also recognizing the limitation of the sample size. Additionally, as seen in the confidence intervals for each Flynn effect size, the confidence intervals are quite large and may indicate sampling error. It is also critical to acknowledge the inherent change in structure that accompanied the new edition, especially for the subtests that comprise the VCI, VSI, FRI, and PRI, and for the new subtests that were added for the WMI and FRI.

Future Directions

Future research exploring the Flynn effect should also consider this dual approach of comparison between both the full scale score and composite/subtest level to understand the nuanced change in cognitive ability over time. Furthermore, future research should consider younger age groups as the present study primarily investigated the adult population, with a small glimpse at adolescence for teens aged 16. Thus, exploration for children and teens would be interesting to consider, especially with the recent publication of the fifth edition of the Woodcock-Johnson (WJ V; McGrew et al., 2025) and with the sixth edition of the WISC slated for release. These data could be valuable for implications in educational settings.

Conclusions

Taking a deeper dive into the subtest and index Flynn effect on the WAIS-5, the findings of this study reveal significant deviations from the traditional Flynn effect. Both adult and adolescent groups demonstrated lower-than-expected cognitive gains and, in some cases, notable declines. Fluid reasoning abilities showed very little lessening of a Flynn effect within both samples studied, whereas crystallized, school-related, and language abilities showed smaller Flynn effects and, in some instances, reverse Flynn effects. Among adolescents, the stark reversals in subtests like Similarities, Vocabulary, and Arithmetic, alongside declines in working memory, raise concerns about the impact of modern societal factors, such as the pandemic, increased screen time, and social media usage, on cognitive development. While some of these trends align with Flynn's prediction of a diminishing effect, the pronounced reversals and their timing suggest that broader societal changes may be exacerbating these declines. These findings underscore the need for further research to disentangle the complex interplay of environmental, educational, and technological influences on cognitive abilities, particularly as they relate to the evolving challenges faced by younger generations. In short, it is important to remember Flynn's (2012) words, "an IQ score is not a number but a message" (p. 83).

References

Awh, E., Vogel, E. K., & Oh, S. H. (2006). Interactions between attention and working memory. *Neuroscience*, *139*(1), 201–208. https://doi.org/10.1016/j.neuroscience.2005.08.023

Benson, N., Beaujean, A. A., & Taub, G. E. (2015). Using score equating and measurement invariance to examine the Flynn effect in the Wechsler Adult Intelligence Scale. *Multivariate Behavioral Research*, *50*(4), 398–415. https://doi.org/10.1080/00273171.2015.1022642

Bratsberg, B., & Rogeberg, O. (2018). Flynn effect and its reversal are both environmentally caused. *Proceedings of the National Academy of Sciences of the United States of America*, *115*(26), 6674–6678. https://doi.org/10.1073/pnas.1718793115

Colom, R., García, L. F., Shih, P. C., & Abad, F. J. (2023). Generational intelligence tests score changes in Spain: Are we asking the right question? *Intelligence*, *99*, Article 101772. https://doi.org/10.1016/j.intell.2023.101772

Dutton, E., & Lynn, R. (2013). A negative Flynn effect in Finland, 1997–2009. *Intelligence*, *41*(6), 817–820. https://doi.org/10.1016/j.intell.2013.05.008

Dutton, E., van der Linden, D., & Lynn, R. (2016). The negative Flynn effect: A systematic literature review. *Intelligence*, *59*, 163–169. https://doi.org/10.1016/j.intell.2016.10.002

Dworak, E. M., Revelle, W., & Condon, D. M. (2023). Looking for Flynn effects in a recent online U.S. adult sample: Examining shifts within the SAPA Project. *Intelligence*, *98*, Article 101734. https://doi.org/10.1016/j.intell.2023.101734

Fletcher, J. M., Stuebing, K. K., & Hughes, L. C. (2010). IQ scores should be corrected for the Flynn effect in high-stakes decisions. *Journal of Psychoeducational Assessment*, *28*(5), 469–473. https://doi.org/10.1177/0734282910373341

Flynn, J. R. (1984). The mean IQ of Americans: Massive gains 1932–1978. *Psychological Bulletin*, *95*(1), 29–51. https://doi.org/10.1037/0033-2909.95.1.29

Flynn, J. R. (1987). Massive IQ gains in 14 nations: What IQ tests really measure. *Psychological Bulletin*, *101*(2), 171–191. https://doi.org/10.1037/0033-2909.101.2.171

Flynn, J. R. (2009). *What is intelligence? Beyond the Flynn effect*. Cambridge University Press.

Flynn, J. R. (2012). *Are we getting smarter? Rising IQ in the twenty-first century*. Cambridge University Press. https://doi.org/10.1017/CBO9781139235679

Flynn, J. R., & Weiss, L. G. (2007). American IQ gains from 1932 to 2002: The WISC subtests and educational progress. *International Journal of Testing*, *7*(2), 209–224. https://doi.org/10.1080/15305050701193587

Gonthier, C., Grégoire, J., & Besançon, M. (2021). No negative Flynn effect in France: Why variations of intelligence should not be assessed using tests based on cultural knowledge. *Intelligence*, *84*, Article 101512. https://doi.org/10.1016/j.intell.2020.101512

Haidt, J. (2024). *The anxious generation*. Penguin Press.

Herrnstein, R. J., & Murray, C. (1994). *The bell curve: Intelligence and class structure in American life*. Free Press.

Jensen, A. R. (1998). *The g Factor: The science of mental ability*. Praeger.

Kaufman, A. S. (2010). "In what way are apples and oranges alike?" A critique of Flynn's interpretation of the Flynn effect. *Journal of Psychoeducational Assessment*, *28*(5), 382–398. https://doi.org/10.1177/0734282910373346

Kaufman, A. S., & Kaufman, N. L. (1990). *K-BIT: Kaufman brief intelligence test manual*. American Guidance Service.

Kaufman, A. S., Raiford, S. E., & Coalson, D. L. (2016). *Intelligent testing with the WISC*. Wiley. https://doi.org/10.1002/9781394259397

Kokoç, M. (2021). The mediating role of attention control in the link between multitasking with social media and academic performances among adolescents. *Scandinavian Journal of Psychology*, *62*(4), 493–501. https://doi.org/10.1111/sjop.12731

Lichtenberger, E. O., & Kaufman, A. S. (2013). *Essentials of WAIS-IV assessment*. Wiley.

Mazrekaj, D., & De Witte, K. (2024). The impact of school closures on learning and mental health of children: Lessons from the COVID-19 pandemic. *Perspectives on Psychological Science*, *19*(4), 686–693. https://doi.org/10.1177/17456916231181108

McGrew, K. S., Mather, N., LaForte, E. L., & Wendling, B. J. (2025). *Woodcock-Johnson V*. Riverside Assessments.

National Center for Education Statistics. (2025). *The Nation's Report Card*. https://www.nationsreportcard.gov/

Neisser, U., Boodoo, G., Bouchard, T. J., Jr., Boykin, A. W., Brody, N., Ceci, S. J., Halpern, D. F., Loehlin, J. C., Perloff, R., Sternberg, R. J., & Urbina, S. (1996). Intelligence: Knowns and unknowns. *American Psychologist*, *51*(2), 77–101. https://doi.org/10.1037/0003-066X.51.2.77

O'Keefe, P., & Rodgers, J. L. (2019). The corrosive influence of the Flynn effect on age normed tests. *Multivariate Behavioral Research*, *54*(1), Article 155. https://doi.org/10.1080/00273171.2018.1562322

O'Keefe, P., & Rodgers, J. L. (2020). The Flynn effect can become embedded in tests: How cross-sectional age norms can corrupt longitudinal research. *Intelligence*, *82*, Article 101481. https://doi.org/10.1016/j.intell.2020.101481

O'Keefe, P., Wänström, L., & Rodgers, J. L. (2023). Reframing the clouded scientific spectacles of the Flynn effect: A view through two lenses. *Intelligence*, *97*, Article 101735. https://doi.org/10.1016/j.intell.2023.101735

Peng, P., Barnes, M., Wang, C., Wang, W., Li, S., Swanson, H. L., Dardick, W., & Tao, S. (2018). A meta-analysis on the relation between reading and working memory. *Psychological Bulletin*, *144*(1), 48–76. https://doi.org/10.1037/bul0000124

Pew Research Center. (2024). *Teens, social media and technology 2024*. https://www.pewresearch.org/internet/2024/12/12/teens-social-media-and-technology-2024/

Pietschnig, J., & Voracek, M. (2015). One century of global IQ gains: A formal meta-analysis of the Flynn effect (1909–2013). *Perspectives on Psychological Science: A Journal of the Association for Psychological Science*, *10*(3), 282–306. https://doi.org/10.1177/1745691615577701

Platt, J. M., Keyes, K. M., McLaughlin, K. A., & Kaufman, A. S. (2019). The Flynn effect for fluid IQ may not generalize to all ages or ability levels: A population-based study of 10,000 US adolescents. *Intelligence*, *77*, Article 101385. https://doi.org/10.1016/j.intell.2019.101385

Raghubar, K. P., Barnes, M. A., & Hecht, S. A. (2010). Working memory and mathematics: A review of developmental, individual difference, and cognitive approaches. *Learning and Individual Differences*, *20*(2), 110–122. https://doi.org/10.1016/j.lindif.2009.10.005

Reynolds, C. R., & Kaufman, A. S. (1990). Assessment of children's intelligence with the Wechsler Intelligence Scale for Children Revised (WISC-R). In C. R. Reynolds & R. W. Kamphaus (Eds.), *Handbook of psychological and educational assessment of children: Intelligence and achievement* (pp. 127–165). Guilford Press.

Reynolds, C. R., Niland, J., Wright, J. E., & Rosenn, M. (2010). Failure to apply the Flynn correction in death penalty litigation: Standard practice of today maybe, but certainly malpractice of tomorrow. *Journal of Psychoeducational Assessment*, *28*(5), 477–481. https://doi.org/10.1177/0734282910373348

Rodgers, J. L. (1998). A critique of the Flynn effect: Massive IQ gains, methodological artifacts, or both? *Intelligence*, *26*(4), 337–356. https://doi.org/10.1016/S0160-2896(99)00004-5

Ruggles, S., Flood, S., Sobek, M., Backman, D., Chen, A., Cooper, G., Richards, S., Rogers, R., & Schouweiler, M. (2023). *IPUMS USA* (Version 14.0) [Data set]. IPUMS. https://doi.org/10.18128/D010.V14.0

Runquist, E. A. (1936). Intelligence test scores and school marks in 1928 and 1933. *School and Society*, *43*, 301–304.

Rushton, J. P., & Jensen, A. R. (2010). The rise and fall of the Flynn effect as a reason to expect a narrowing of the black–white IQ gap. *Intelligence*, *38*, 213–219. https://doi.org/10.1016/j.intell.2009.12.002

Shoshani, A., & Kor, A. (2024). The longitudinal impact of the COVID-19 pandemic on adolescents' internalizing symptoms, substance use, and digital media use. *European Child & Adolescent Psychiatry*, *33*(5), 1583–1595. https://doi.org/10.1007/s00787-023-02269-7

Sundet, J. M., Barlaug, D. G., & Torjussen, T. M. (2004). The end of the Flynn effect? A study of secular trends in mean intelligence test scores of Norwegian conscripts during half a century. *Intelligence*, *32*(4), 349–362. https://doi.org/10.1016/S0160-2896(04)00052-2

Teasdale, T., & Owen, D. R. (2008). Secular declines in cognitive test scores: A reversal of the Flynn effect. *Intelligence*, *36*(2), 121–126. https://doi.org/10.1016/j.intell.2007.01.007

Teasdale, T. W., & Owen, D. R. (2005). A long-term rise and recent decline in intelligence test performance: The Flynn effect in reverse. *Personality and Individual Differences*, *39*(4), 837–843. https://doi.org/10.1016/j.paid.2005.01.029

Trahan, L. H., Stuebing, K. K., Fletcher, J. M., & Hiscock, M. (2014). The Flynn effect: A meta-analysis. *Psychological Bulletin*, *140*(5), 1332–1360. https://doi.org/10.1037/a0037173

Twenge, J. M. (2023). *Generations*. First Atria Books.

Walker, T. (2024). Take cellphones out of the classroom, educators say. *NEA Today*. https://www.nea.org/nea-today/all-news-articles/take-cellphones-out-classroom-educators-say

Wechsler, D. (in press). *WMS®5 Wechsler Memory Scale®—Fourth Edition*. Pearson.

Wechsler, D. (2008). *WAIS®IV Wechsler Adult Intelligence Scale® –Fourth Edition: Technical and interpretive manual*. Pearson.

Wechsler, D. (2014). *WISC®V Wechsler Intelligence Scale for children*. Pearson.

Wechsler, D. (2024). *WAIS-5 Wechsler Adult Intelligence Scale–Fifth Edition*. Pearson.

Wechsler, D., Raiford, S. E., & Presnell, K. (2024a). *WAIS®5 Wechsler Adult Intelligence Scale®– Fifth Edition: Administration and scoring manual*. Pearson.

Wechsler, D., Raiford, S. E., & Presnell, K. (2024b). *WAIS®5 Wechsler Adult Intelligence Scale®—Fifth Edition: Technical and interpretive manual*. Pearson.

Winter, E. L., Trudel, S. M., & Kaufman, A. S. (2024). Wait, where's the Flynn effect on the WAIS-5? *Journal of Intelligence*, *12*(11), Article 118. https://doi.org/10.3390/jintelligence12110118

Zhou, X., Zhu, J., & Weiss, L. G. (2010). Peeking inside the "black box" of the Flynn effect: Evidence from three Wechsler instruments. *Journal of Psychoeducational Assessment*, *28*(5), 399–411. https://doi.org/10.1177/0734282910373340

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