



ASVAB Re-norming Needs Assessment: Identifying the Need for and Approaches to Re-norming the ASVAB

Prepared for DACMPT

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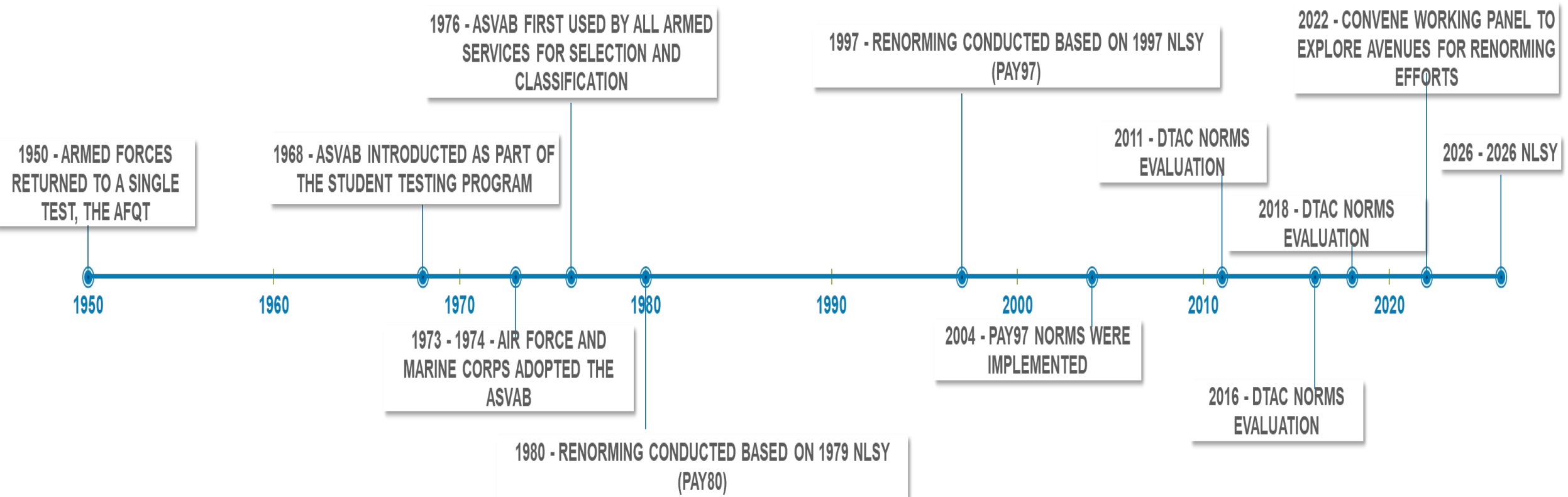
Evaluate state of current ASVAB norms and prepare for future norming efforts

Establish updated national norms for the ASVAB:

- Indicate when new norms are necessary
- Research norming needs and possible avenues to re-norming



Brief History of Norming the ASVAB



- When should norms be updated?
- What norming methods are available to take advantage of lessons learned throughout the history of norming the ASVAB?

Current Norming Efforts: When should norms be updated?

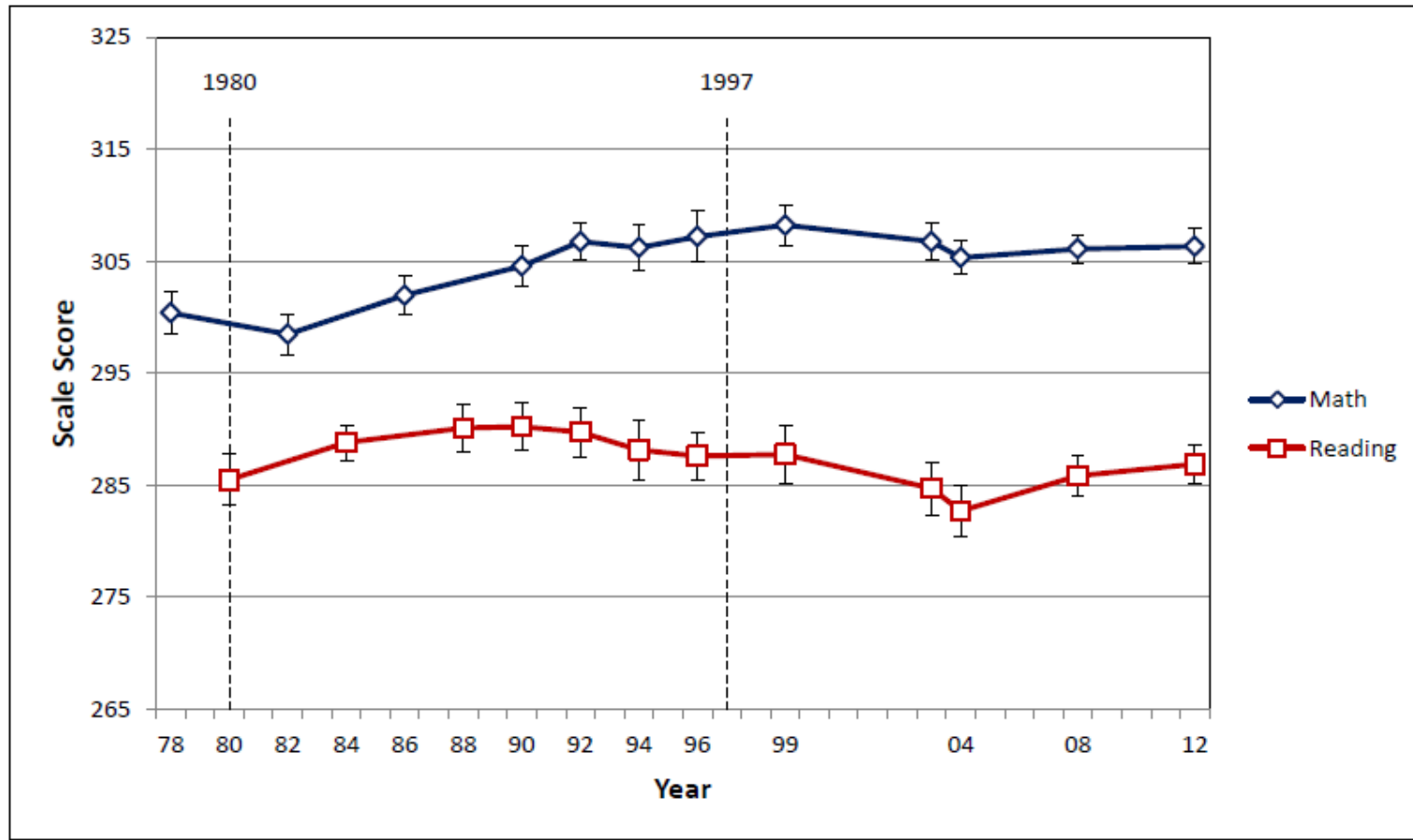
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When should norms be updated? Call to Action

The July 2017 Defense Advisory Committee indicated that it is not the age of the norms, but the validity of the norms and the changes in the norming group that are most important to consider:

- Validity
 - Does the norming group represent the target population?
 - Are the norms based on valid methodology?
 - Have changes in the population caused the ASVAB to not measure the same things as in 1997?
- Norming group
 - Are there changes in abilities?
 - Are there changes in demographics?
 - ***Will changes in demographics and ability levels have a meaningful effect on AFQT scores?***

Are there changes in abilities?

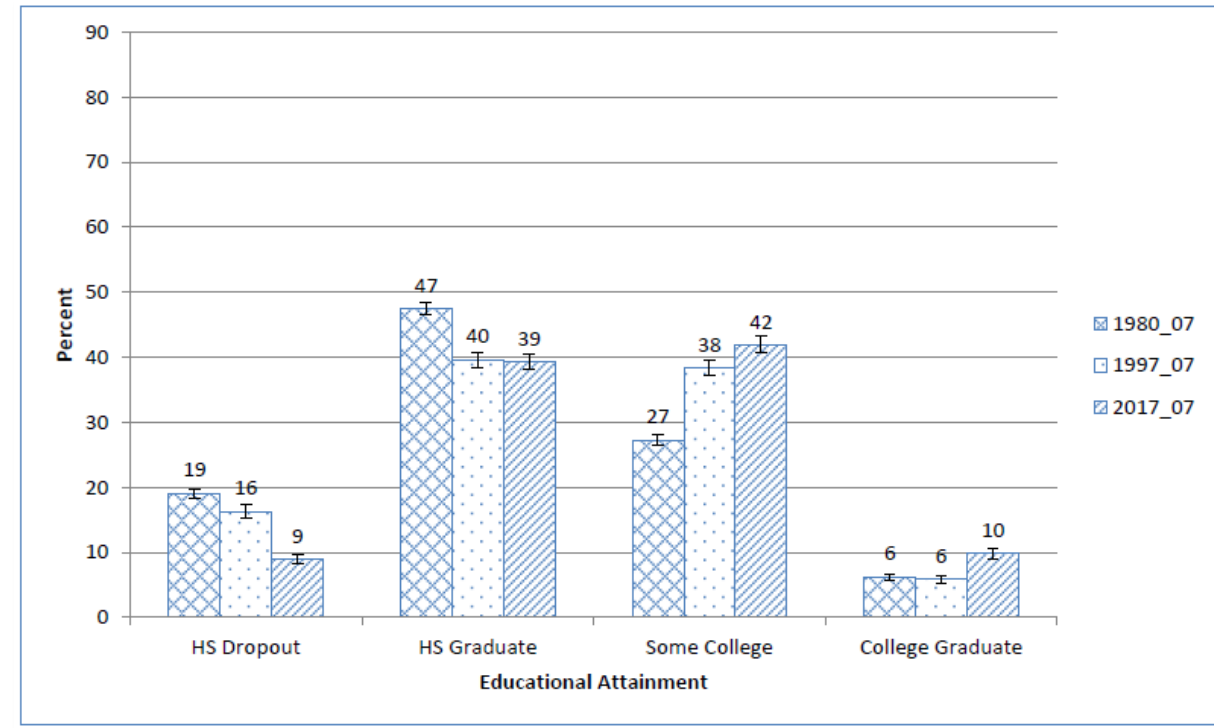
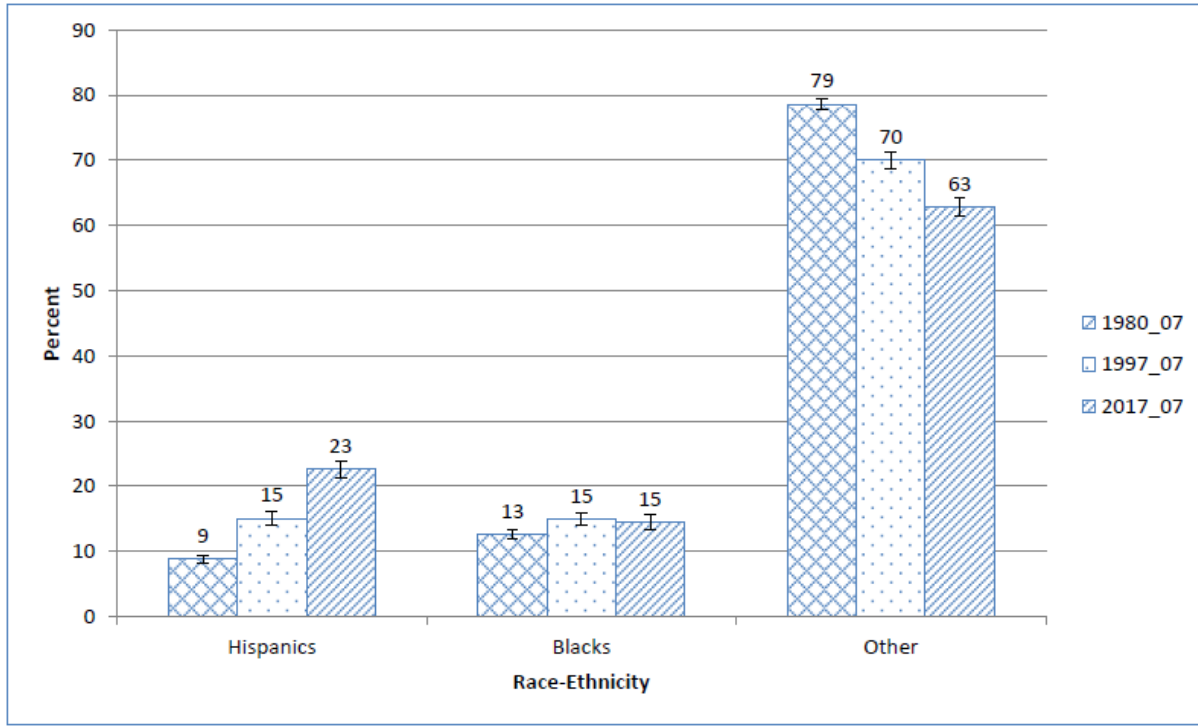


SOURCE: National Assessment of Educational Progress (NAEP), Long-Term Trend Mathematics Assessments.
The original assessment format, content, and procedures were revised minimally in 2004 to provide accommodations to students with disabilities and English language

National Assessment of Educational Progress Long Term Trend Test (LTT)

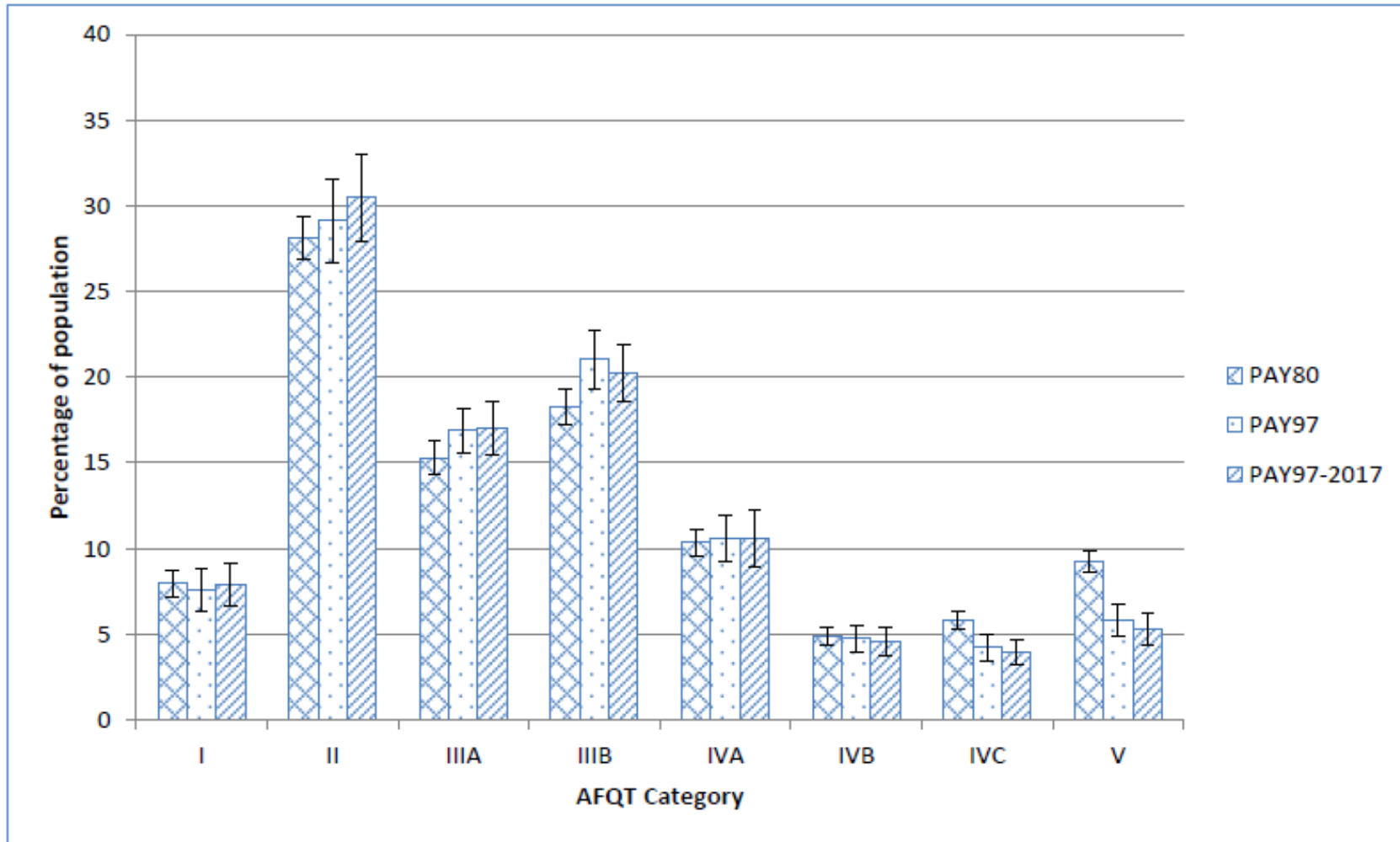
- Last administered to 17-year-olds in 2012
- Moderate increases in NAEP Math and Reading for Black and Hispanic youth yielded a small increase for the total population in 1996
- Changes from 1998 to 2012 are negligible

Are there changes in demographics?



SOURCE: Current Population Survey (CPS) data downloaded from the Integrated Public Use Microdata Series (IPUMS-CPS, University of Minnesota, www.ipums.org)

Do changes have a meaningful effect on AFQT?



- Some negligible differences are seen between PAY80 and PAY97 for IIIB, IVC, and V (maximum percentage point difference = 4%).
- There are no differences between the PAY97 and PAY97–2017 AFQT estimates.

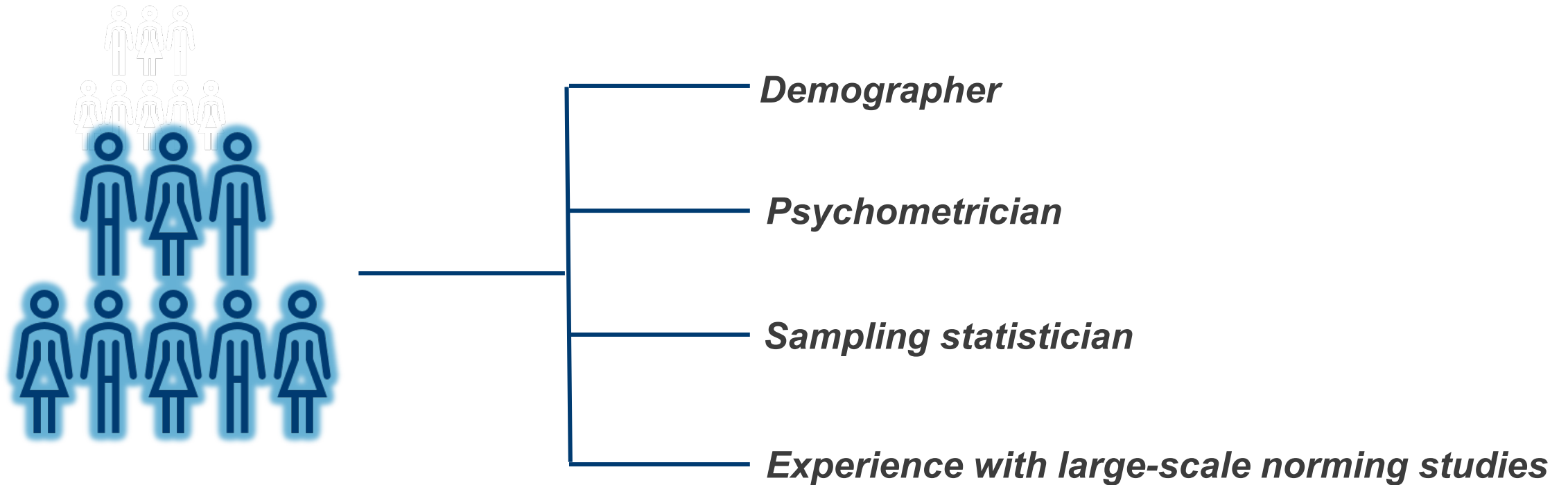
SOURCE: Riemer (January 2018). Identifying the Need for an ASVAB Norming Study – Pay 20xx. Presentation to DACMPT

How should we approach this task?

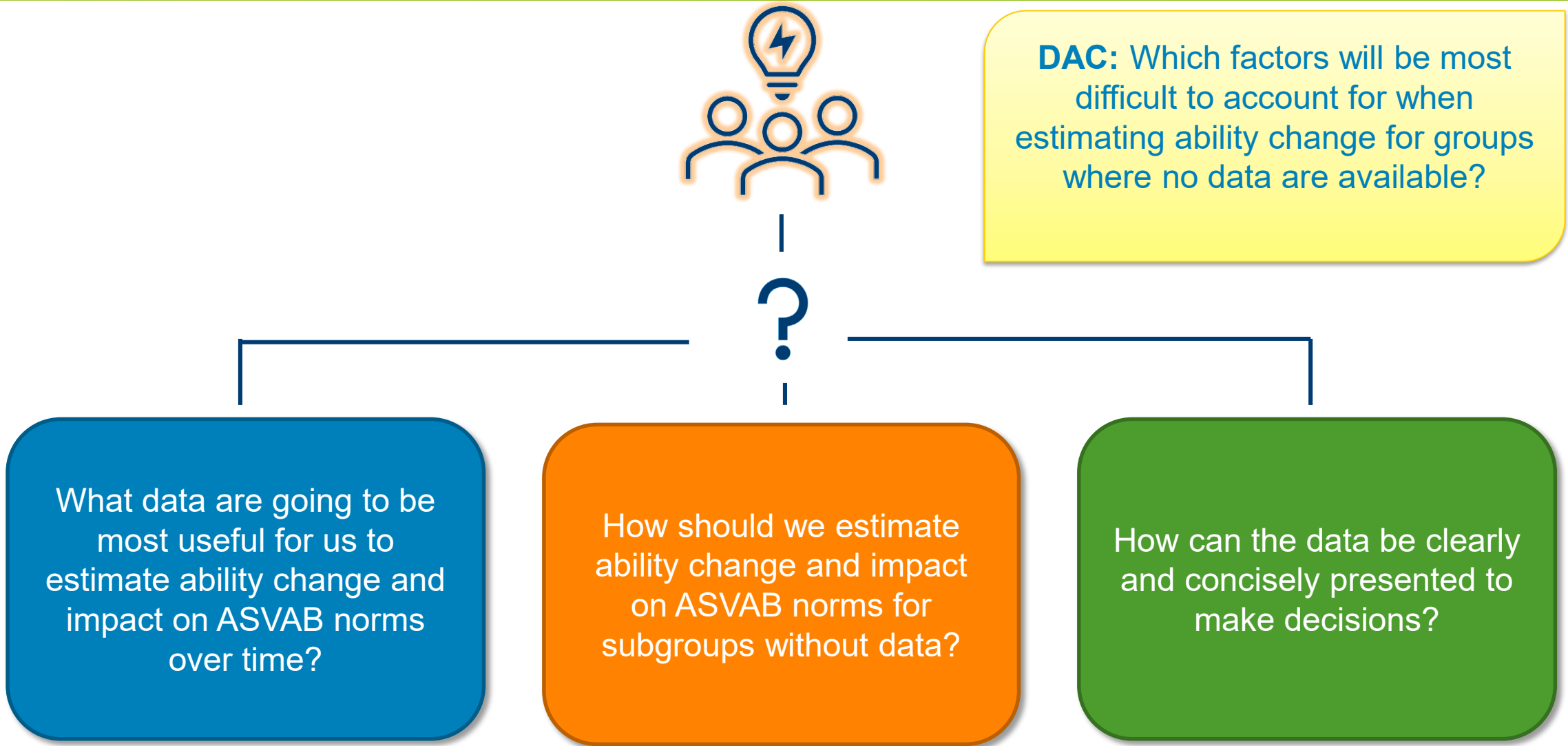


Rather than every 4 years, DTAC would like to see an annual estimate of changes in ability and demographics and how those impact the AFQT estimates

Approach: Assembling a Working Group



Approach: Discuss Relevant Decisions



Approach: Set the Criteria



What amount of change would be needed to justify the expense of conducting a new norming study?

DAC: How would you define “meaningful” change in AFQT scores that should trigger new norming efforts?

Statistical significance

Effect size

Consistent multi-year change

Historical criteria

Current Efforts:

What norming methods are available?

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What norming methods are available? **Call to Action**

What we learned from PAY97:

- The PAY97 eligible response rate was 77%, which was lower than for PAY80
 - Particularly underrepresented Hispanic population
- The PAY97 educational level estimates were dramatically higher than expected



Norming Method Options

Bureau of Labor Statistics is developing a needs assessment for methods and research questions for a 2026 National Longitudinal Survey of Youth (NLSY26)

- Included an expert panel on how to partner with Department of Defense on measures of cognition, personality, and career interests of youth
- Currently considering a similar arrangement to previous efforts



Norming Method Options (continued)

Available Methods

- Strengths and weaknesses
- Cost
- Relevant research studies

Considerations

- Sampling
- Communication
- Data collection
- Data analysis



Questions for the DAC

- What thoughts do you have on which factors will be most difficult to account for when estimating ability change for groups where no data are available?
- How would you define *meaningful* change in AFQT scores that should trigger new norming efforts?
- Aside from large-scale studies similar to those already conducted, what are some other ways that norming data can be collected?

How can we take into consideration the impacts of the COVID-19 pandemic on educational achievement?

Questions?

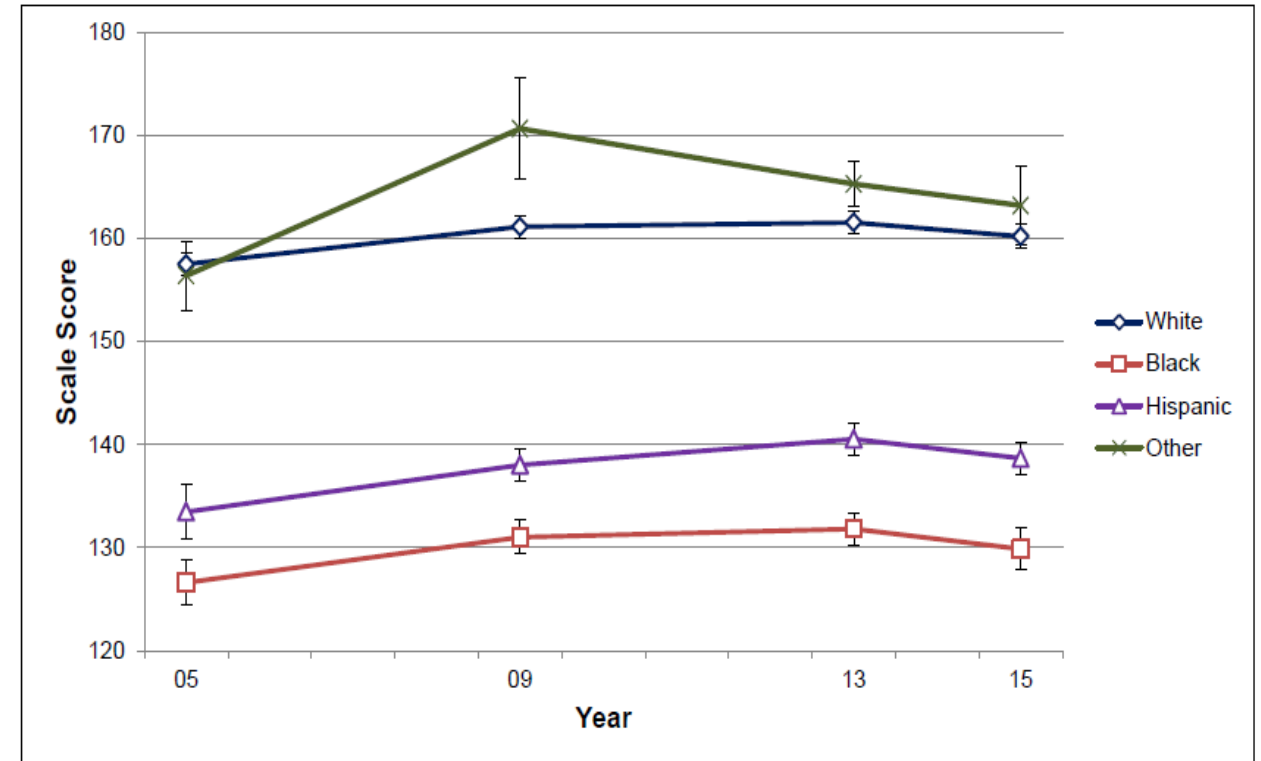
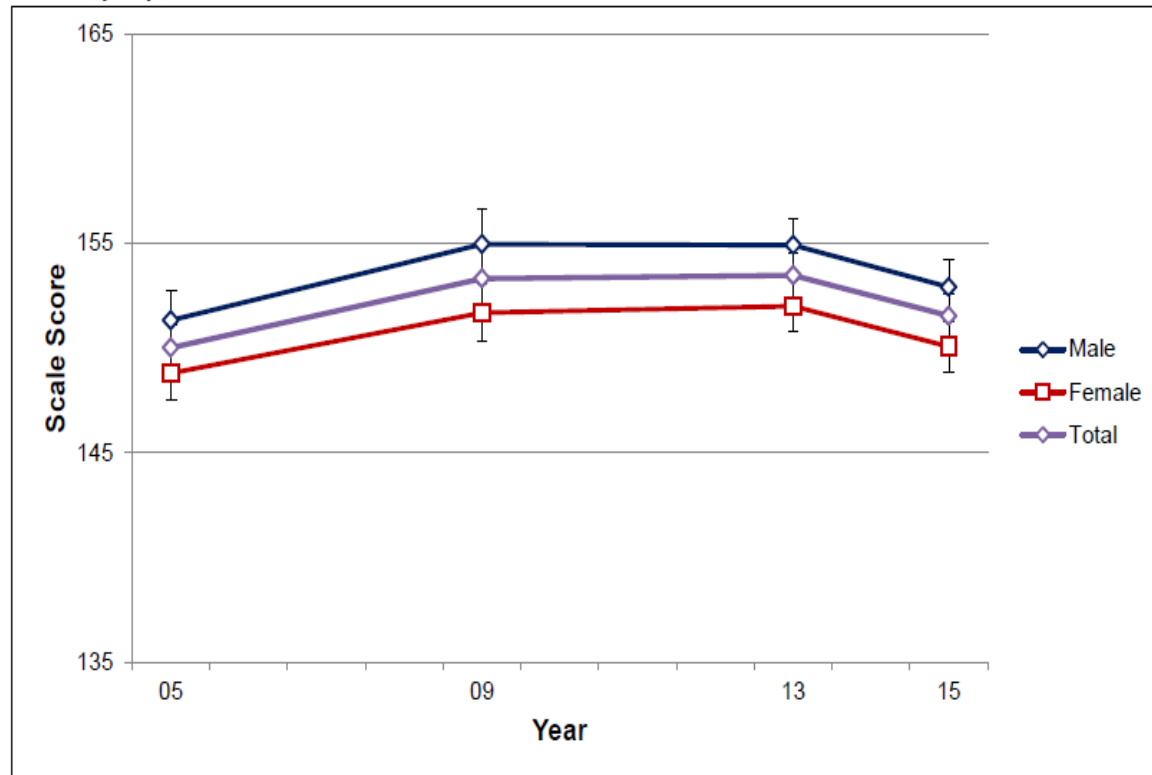
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Additional Information

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Are there changes in abilities?

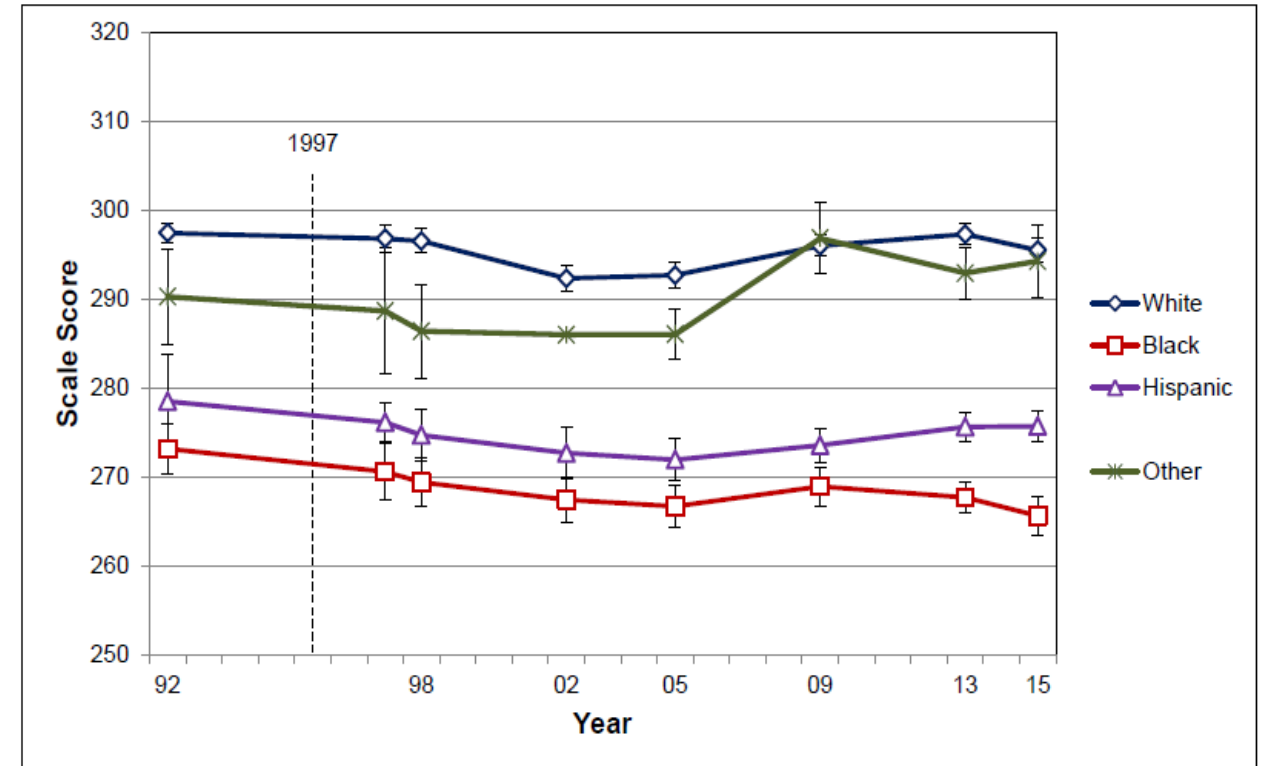
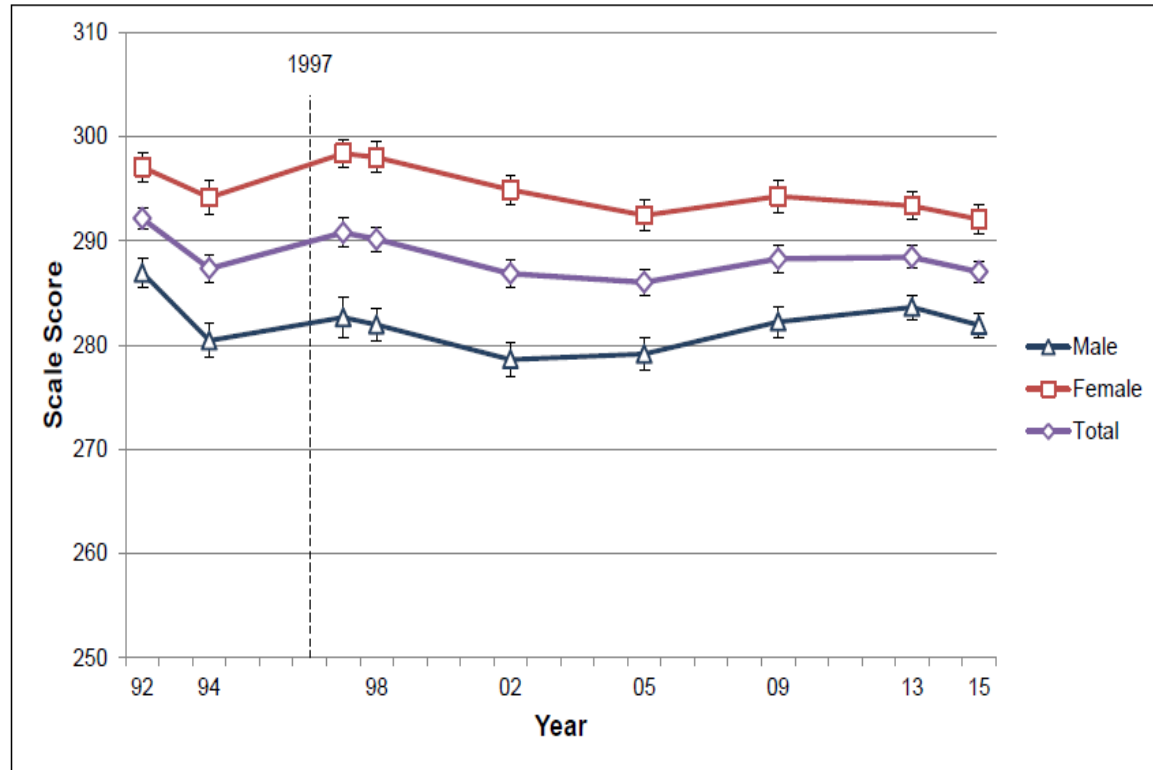
Trend in NAEP math scores for 12th-grade students



SOURCE: National Assessment of Educational Progress (NAEP), Mathematics Assessments.

Are there changes in abilities?

Trend in NAEP reading scores for 12th-grade students



SOURCE: National Assessment of Educational Progress (NAEP), Reading Assessments.

Are there changes in abilities?

Applicant counts and percentages by age for 1997, 2010, and 2014 populations

AGE	1997		2010		2014	
	Count	%	Count	%	Count	%
16-17	97,320	25	49,883	16	45,378	21
18	95,402	24	66,172	21	55,435	26
19	60,122	15	46,640	15	31,965	15
20	37,580	10	33,120	11	20,751	10
21	25,200	6	24,531	8	15,010	7
22	18,383	5	19,315	6	12,009	6
23	13,482	3	15,693	5	9,545	4
24	10,169	3	11,989	4	7,074	3
25	7,785	2	8,781	3	4,890	2
26	6,495	2	6,629	2	3,624	2
27	4,715	1	5,272	2	2,840	1
28	3,248	1	3,943	1	1,973	1
29	2,575	1	2,988	1	1,457	1
30-34	7,921	2	8,445	3	3,868	2
35+	1269	0	4711	2	363	0
Total	391,666	100	308,112	100	216,182	100
18 to 23	250,169	64	205,471	67	144,715	67

Accession counts and percentages by age for 1997, 2010, and 2014 populations

AGE	1997		2010		2014	
	Count	%	Count	%	Count	%
17	8,189	4	3,350	2	3,157	2
18	59,640	32	37,732	24	41,505	30
19	43,756	23	33,758	21	30,609	22
20	24,539	13	22,860	14	18,081	13
21	15,144	8	15,466	10	12,239	9
22	10,600	6	11,893	7	9,037	7
23	7,565	4	8,963	6	7,250	5
24	5,429	3	7,097	4	5,079	4
25	3,966	2	4,809	3	3,516	3
26	2,885	2	3,443	2	2,497	2
27	2,087	1	2,669	2	1,917	1
28	1,357	1	1,847	1	1,246	1
29	1,010	1	1,390	1	812	1
30-34	2573	1	3545	2	1923	1
35+	155	0	1688	1	34	0
Total	188,895	100	160,510	100	138,902	100
18 to 23	161,244	85	130,672	81	118,721	85

SOURCE: Riemer (January 2018). Identifying the Need for an ASVAB Norming Study – Pay 20xx. Presentation to DACMPT

REFERENCES

- Bloxom B., Pashley P., Nicewander, A. & Yan, D. (1995). Linking to a large-scale assessment: An empirical evaluation. *Journal of Educational and Behavioral Statistics*.
- MaCurdy, T. & Vytlačil, E. (2003). Establishing new Norms for the AFQT using data from PAY97. Defense Manpower Data Center.
- Riemer, R. (January 2018). Identifying the need for an ASVAB norming study – Pay 20xx. Presentation to DACMPT.
- Sackett, P. R., Eitelberg, M. J., & Sellman, W. S. (2009). *Profiles of American youth: Generational changes in cognitive skills* (FR-09-22). Human Resource Research Organization.
- Segall, D. (2004). Development and evaluation of the 1997 ASVAB score scale. Defense Manpower Data Center.
- Sims & Hiatt. (2001). Follow-on analysis of PAY test scores. Center for Naval Analyses. Alexandria, Virginia.