



ASTB Workshop Agenda

- ◆ 0900 Welcome Aboard
- ◆ 0910 ASTB Overview
- ◆ 1010 ASTB Standards Review
- ◆ 1110 Transition to web-based ASTB
- ◆ 1200 Break for Lunch
- ◆ 1300 ASTB Revision and Revalidation
- ◆ 1340 Establish future meeting agendas
- ◆ 1400 Fin

11 JUL 02



Overview of the Aviation Selection Test Battery

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Naval Aerospace Medical Institute

Outline

- ◆ Test history, content, purpose
- ◆ Score components
- ◆ Administration rates
- ◆ Performance trends
- ◆ Demographics
- ◆ Predictive relationships with training criteria and attrition

Introduction

- ◆ Primary tool used to select student pilots and student flight officers for the USN, USMC, and USCG
- ◆ Different sections of the battery are also used to select candidates for OCS and positions in Intelligence

Introduction

- ◆ ASTB was first implemented in 1942, with revisions in 1953, 1971, and 1992
- ◆ The current (1992) version was developed in conjunction with ETS to be bias-free in terms of gender and ethnicity
- ◆ 1992 ASTB was validated separately for pilots and NFO's

Composition of the ASTB

- ◆ The test battery consists of 6 tests:
 - Math - Verbal Test (MVT)
 - Mechanical Comprehension Test (MCT)
 - Spatial Apperception Test (SAT)
 - Aviation and Nautical Test (AN)
 - Biographical Inventory (BI)
 - Aviation Interest (AI)

ASTB Scores

- Performance on these tests yields 5 component scores
- Weighted combinations of these tests are used to compute stanine scores (**Range 1 – 9**):
 - AQR:** Academic Qualification Rating
 - PFAR:** Pilot Flight Aptitude Rating
 - FOFAR:** Flight Officer Aptitude Rating
 - PBI:** Pilot Biographical Inventory
 - FOBI:** Flight Officer Biographical Inventory

What do the scores mean?

- ◆ **AQR:** Predictor of performance in academic portions of API and ground school (also predicts attrition)
- ◆ **PFAR, FOFAR:** Predictors of flight grades in primary flight training (also predict attrition)
- ◆ **PBI, FOBI:** Consider background experiences relevant to success in the fast-paced learning environment and demanding lifestyle of aviation. Designed to predict attrition (currently suspended)

ASTB Administration

- ◆ The entire paper and pencil test takes 2.5 hours
- ◆ 150 permanent custody locations:
OSOs, NRDs, NROTCs, Military Institutes,
selected NAS and MCAS in CONUS and
overseas
- ◆ All TASs are returned to NOMI where they are
scored and added to ASTB database
- ◆ NOMI is responsible for the procurement,
distribution, scoring, and control of ALL ASTB
test materials.

ASTB Administration

- ◆ A computerized version of the ASTB has been developed by NAMRL
 - Test is identical to paper-and-pencil version
 - In use at 5 sites in CONUS
- ◆ NOMI will transition to solely web-based ASTB administrations at all permanent custody locations in FY03

Retest & Scoring Policy

◆ Retakes

- 30 days between 1st and 2nd time
- 180 days between tests beyond 2nd time
- Must alternate between Form 1 and 2
- New scores always replace older ones

◆ Waivers are occasionally requested from NOMI, but BUMED-23 has ultimate authority

ASTB Administration Rates

- ◆ 10,000 partial or full ASTBs per year
- ◆ 100,000th administration of the 1992 ASTB given in May 2002
- ◆ 25,000 OAR exams
- ◆ 1,000 Intel exams
- ◆ 15,000 ASTB retests
- ◆ 61,000 individuals tested for aviation selection since 1992

ASTB Retest Rates

25JUN02

- ◆ Test Count:
 - Number of times ASTB taken
- ◆ Examinees:
 - Number of examinees taking ASTB exactly this many times
- ◆ 370 people have taken the full ASTB 4 times

Test Count	Examinees	%
1	47139	77.1%
2	11738	19.2%
3	1817	3.0%
4	370	0.6%
5	80	0.1%
6	30	
7	2	
9	1	
10	1	
Total	61178	

ASTB Retest Rates by Service

25JUN02

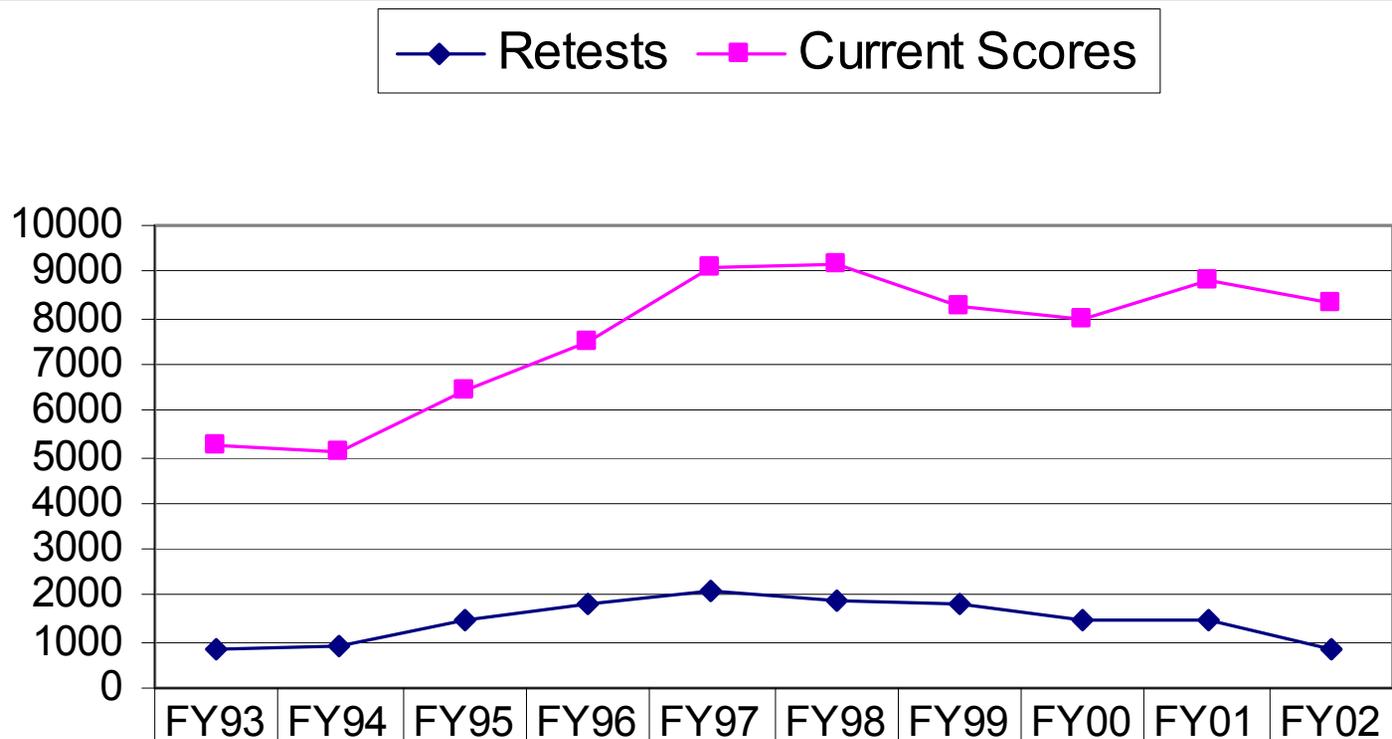
USMC

Count	Examinees	%
1	8897	68.6%
2	3354	25.9%
3	555	4.3%
4	125	1.0%
5	24	0.2%
6	7	0.1%
7	1	
	12963	

USN

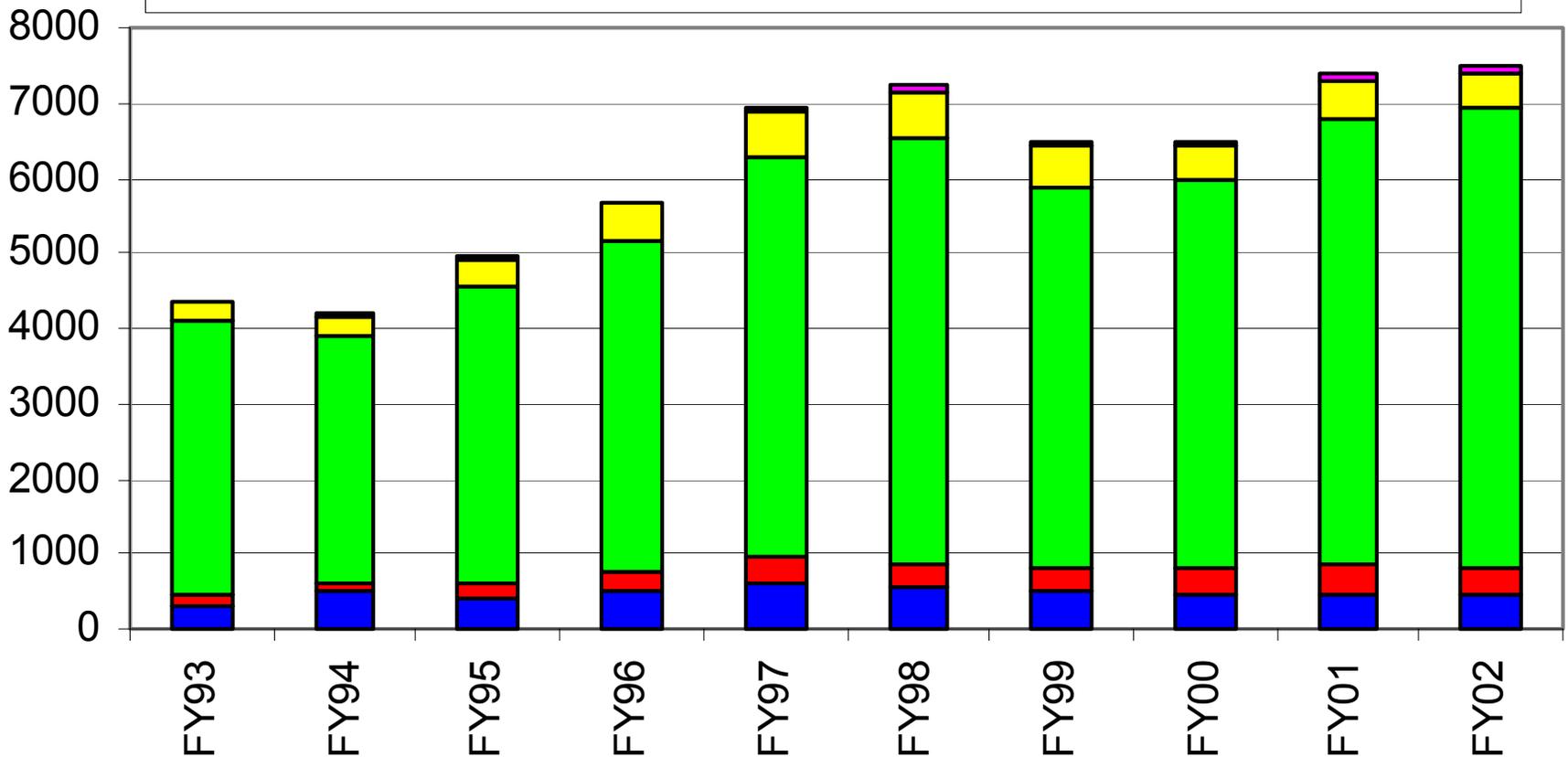
Count	Examinees	%
1	38242	79.3%
2	8384	17.4%
3	1262	2.6%
4	245	0.5%
5	56	0.1%
6	23	
7	1	
9	1	
10	1	
	48215	

ASTB Administrations by FY



Current Scores	4368	4183	4964	5686	6942	7219	6482	6474	7384	7473
Retests	865	915	1436	1790	2125	1915	1798	1469	1446	819

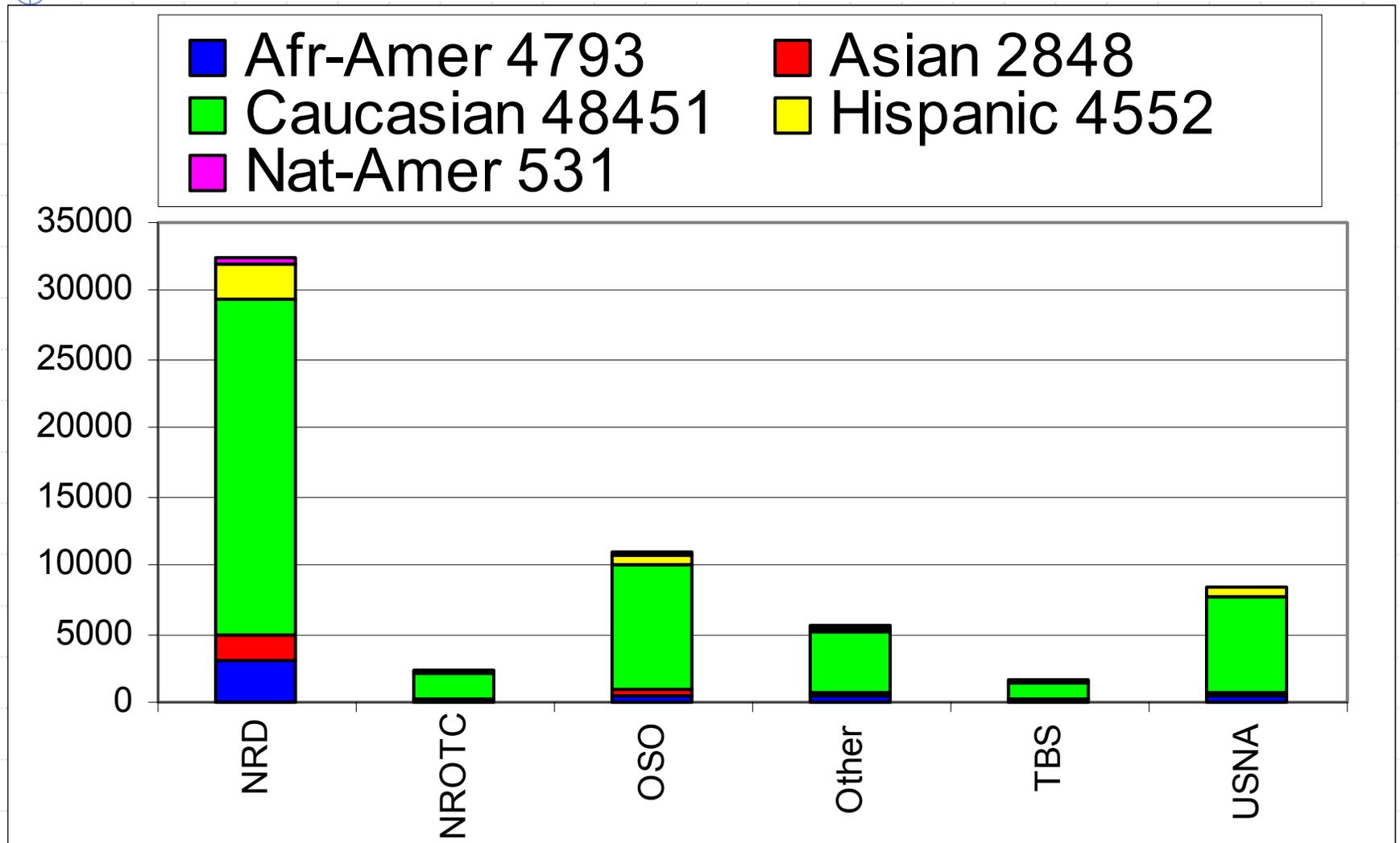
Racial Composition of Examinees by ASTB FY



ASTB Administration Rates

- ◆ 61,000 individuals tested for aviation selection since 1992
 - 14,000 at UICs registered to TBS Quantico, USMC OSOs & MCASs, or USNA/NROTC who became Marines
 - 47,000 at NRDs, Military Institutes, NROTCs, and other Miscellaneous sites

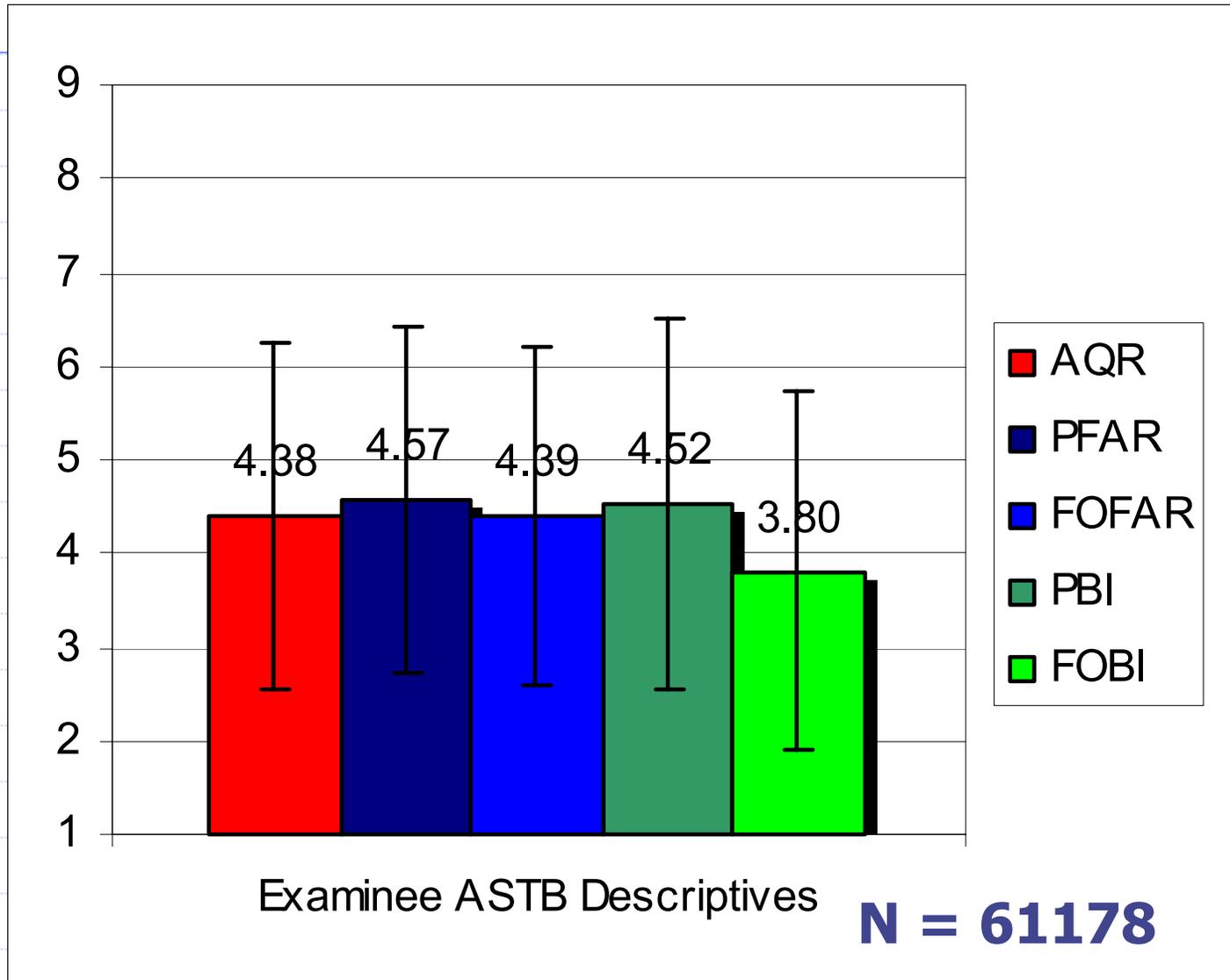
Racial Composition of Examinees by Test Site



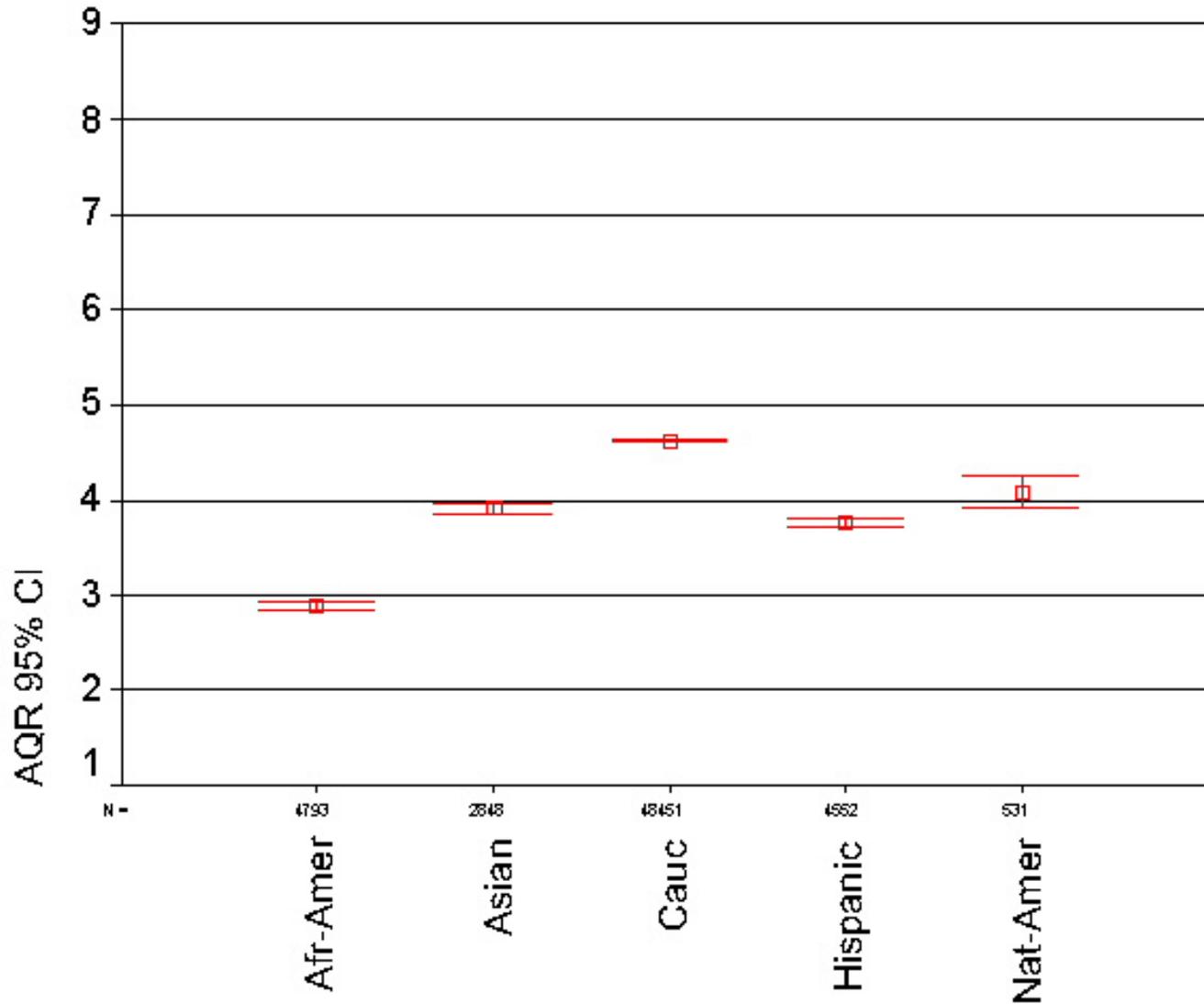
Racial Composition of Examinees by Test Site FY93-FY02

	Afr-Amer	Asian	Caucasian	Hispanic	Nat-Amer	Total	%
NRD	3102	1772	24550	2633	315	32372	52.9%
NROTC	206	89	1900	192	13	2400	3.9%
OSO	539	308	9246	714	86	10893	17.8%
Other	351	270	4493	356	46	5516	9.0%
TBS	152	72	1227	147	12	1610	2.6%
USNA	443	337	7035	510	59	8384	13.7%
Total	4793	2848	48451	4552	531	61175	
%	7.8%	4.7%	79.2%	7.4%	0.9%		

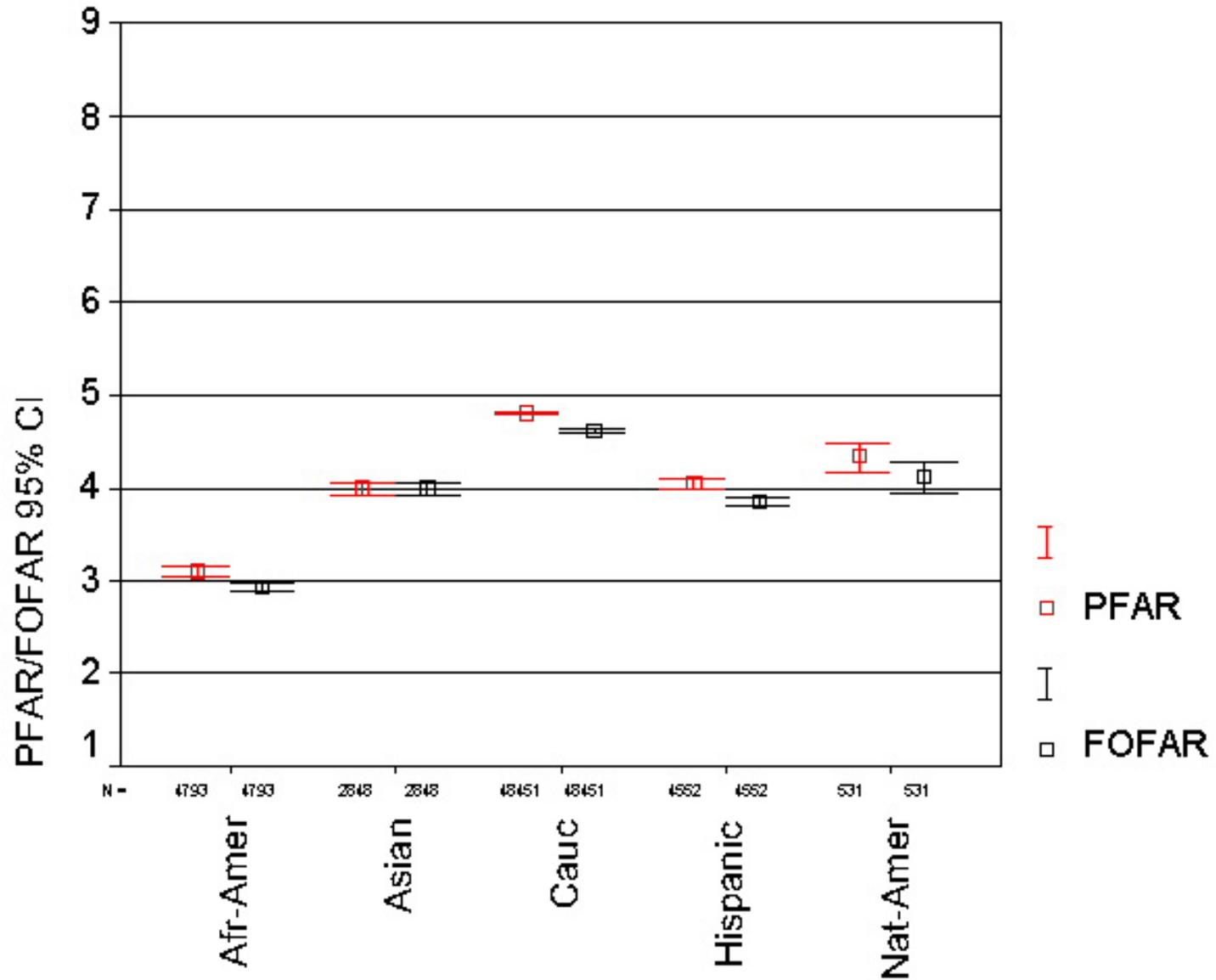
Examinee ASTB Means



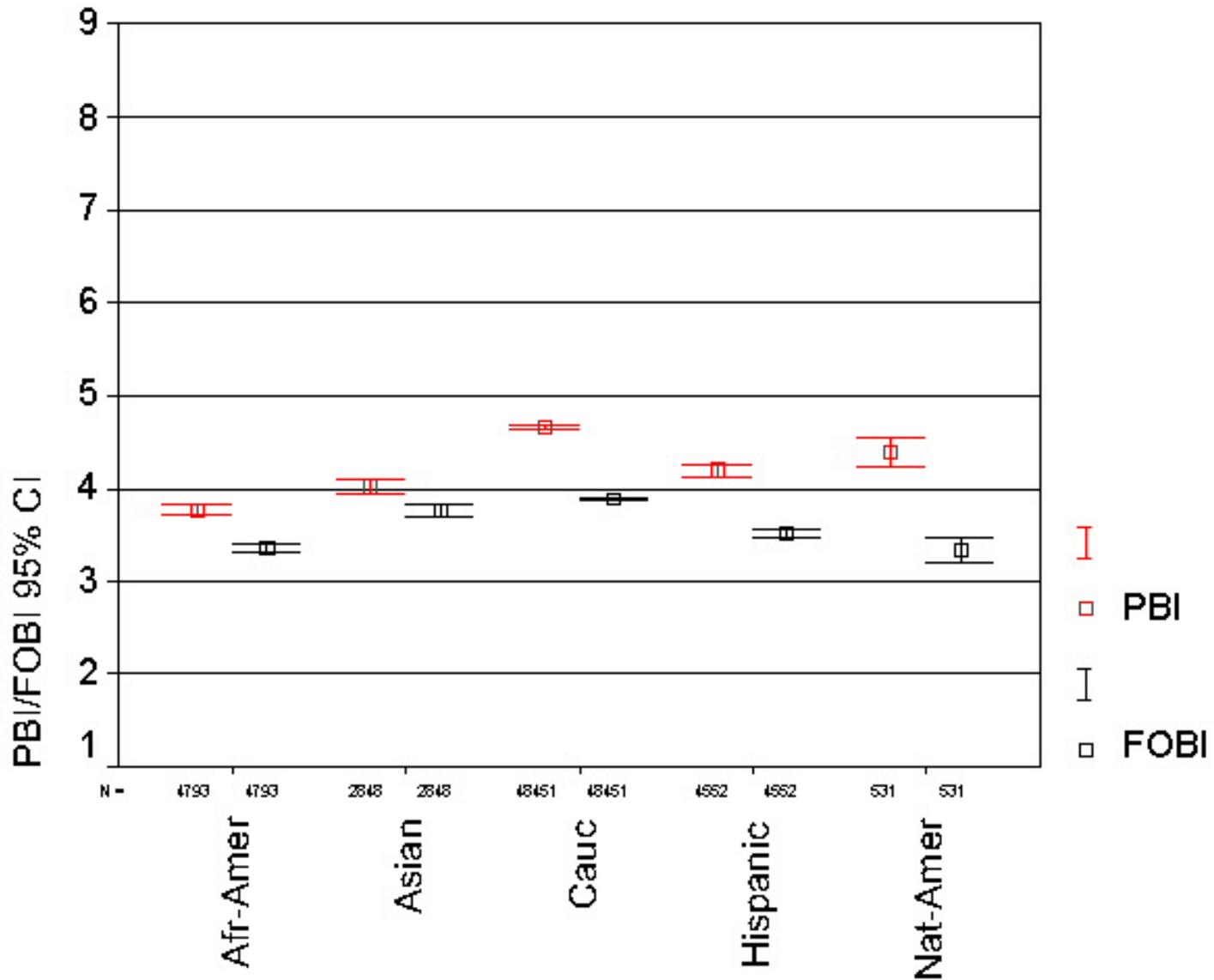
Examinee AQR by Race



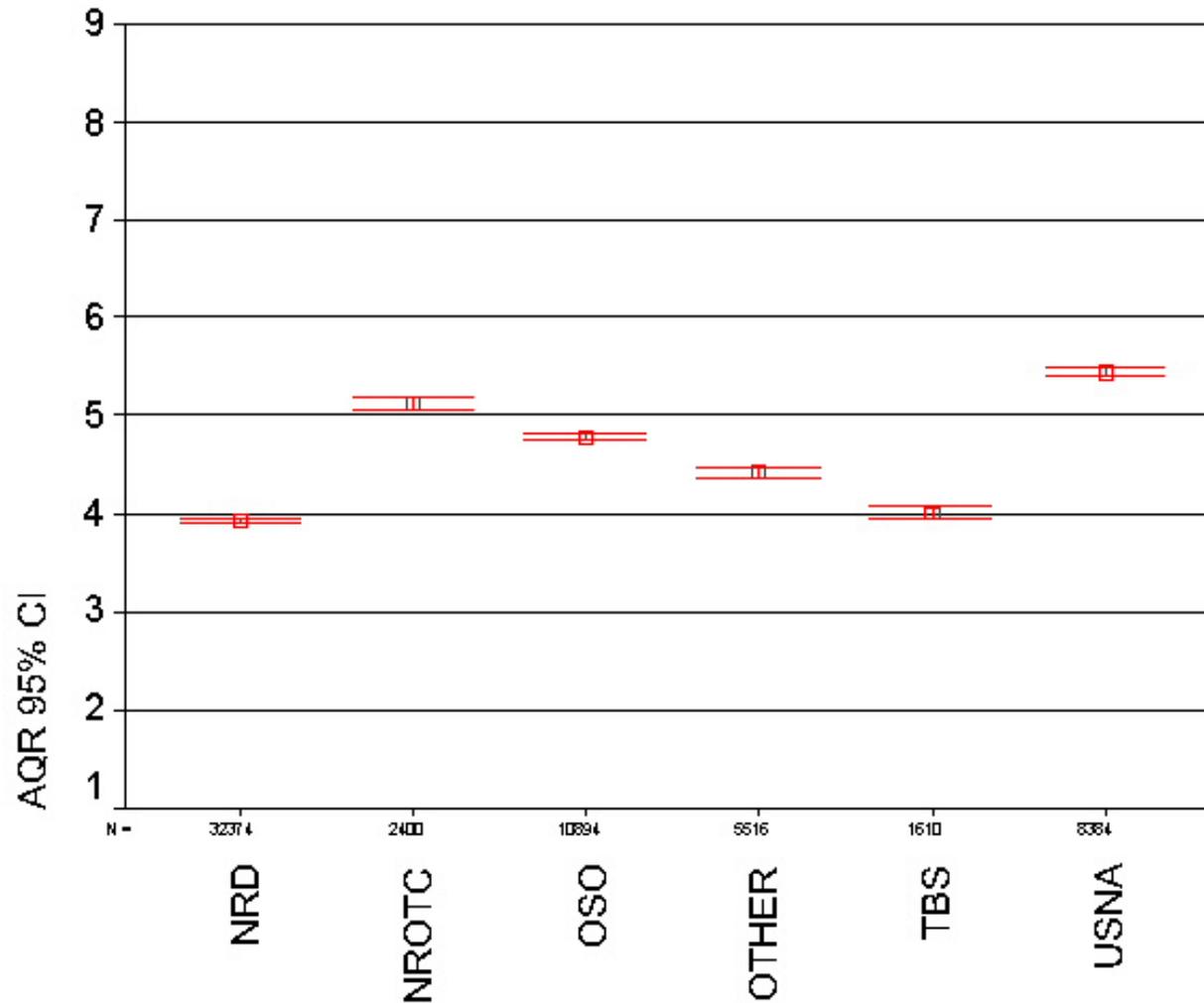
Examinee FAR by Race



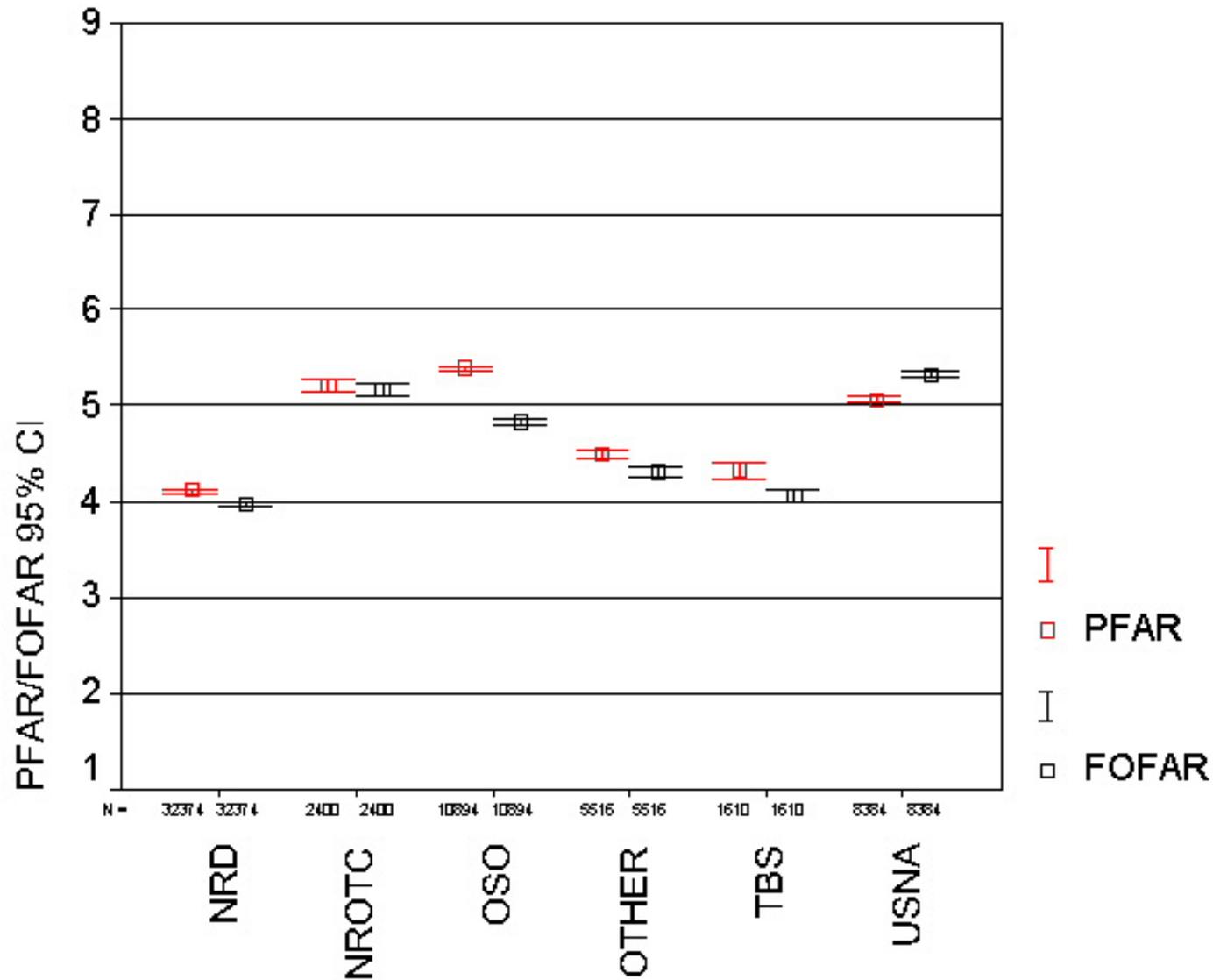
Examinee BI by Race



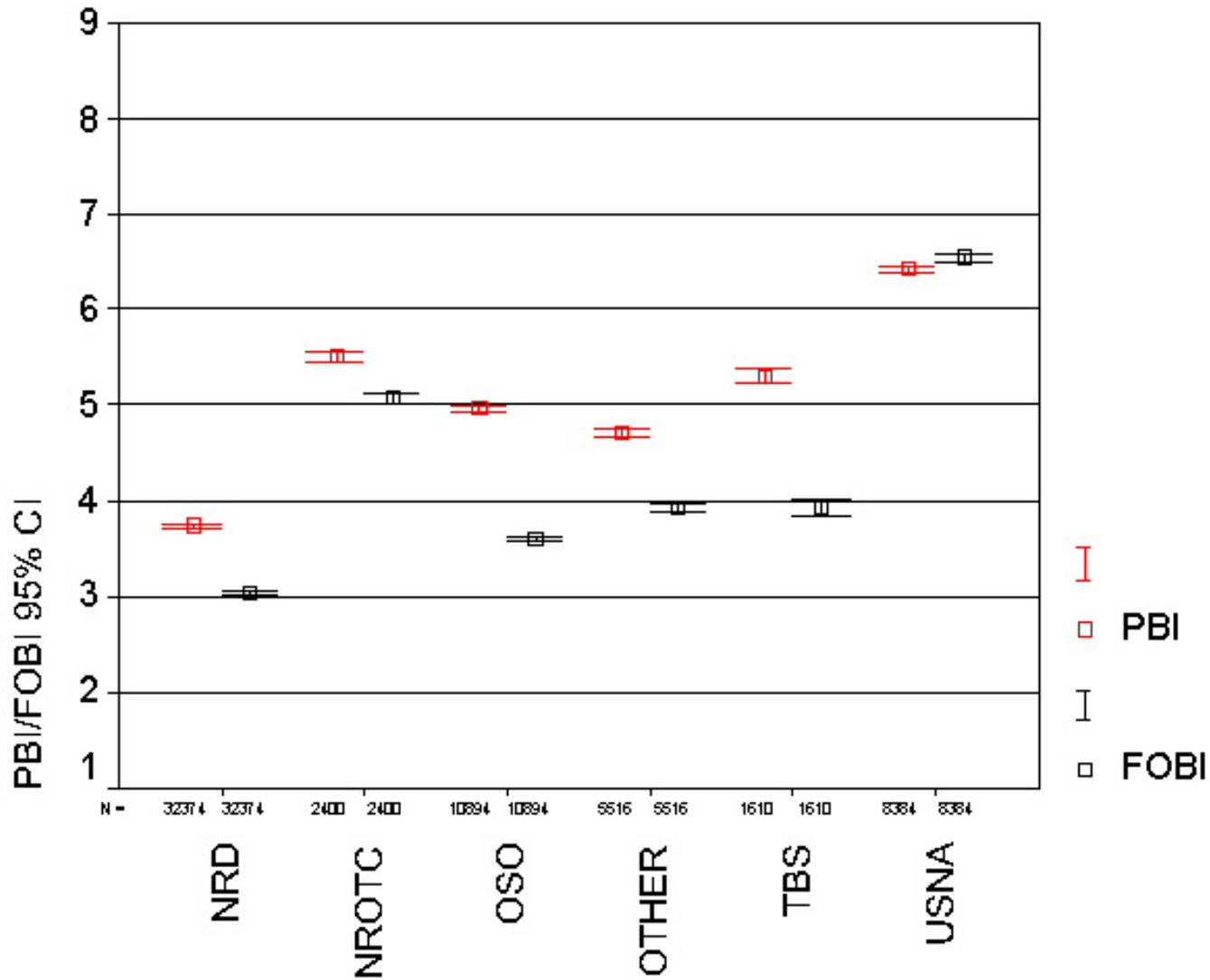
Examinee AQR by Test Site



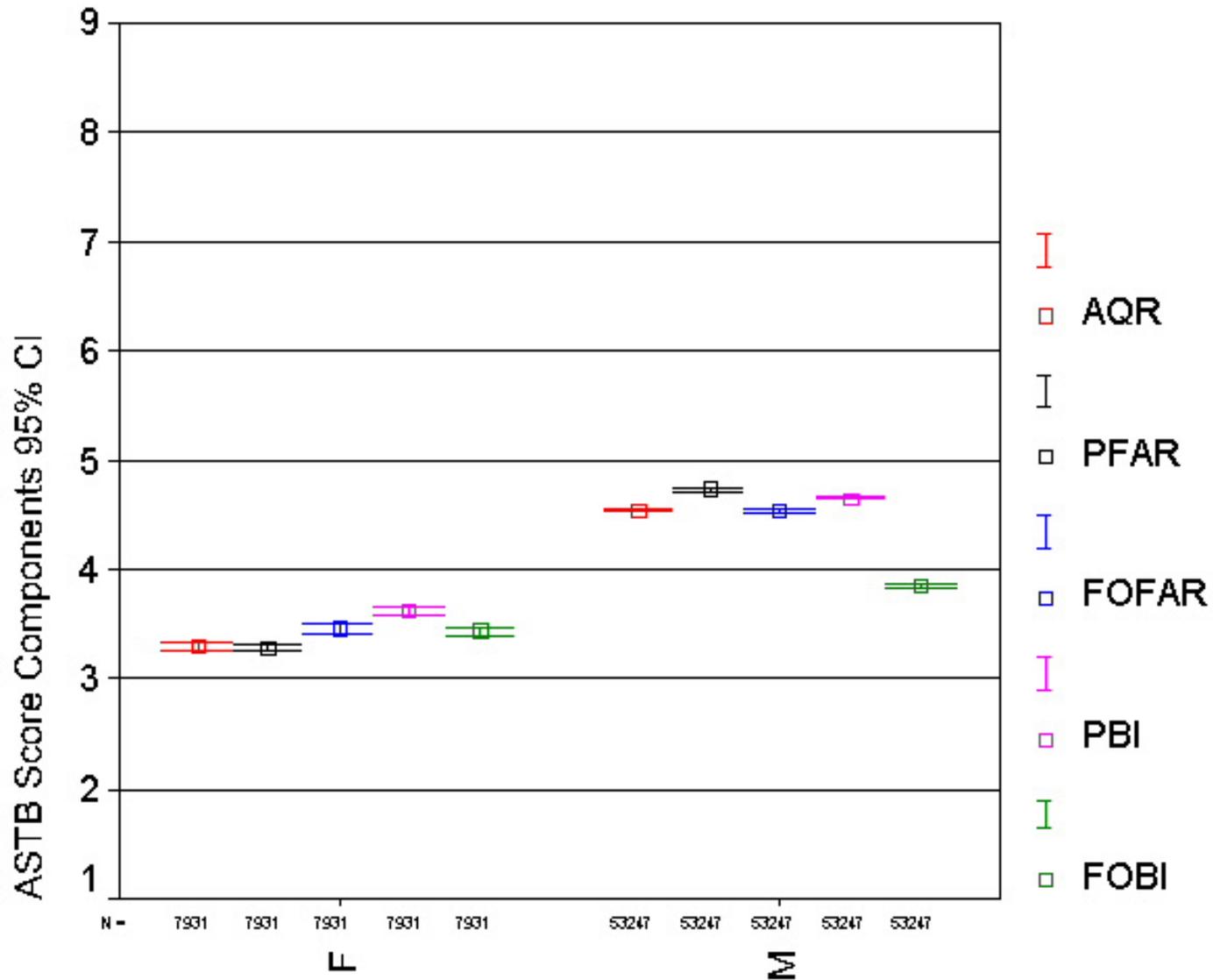
Examinee FAR by Test Site



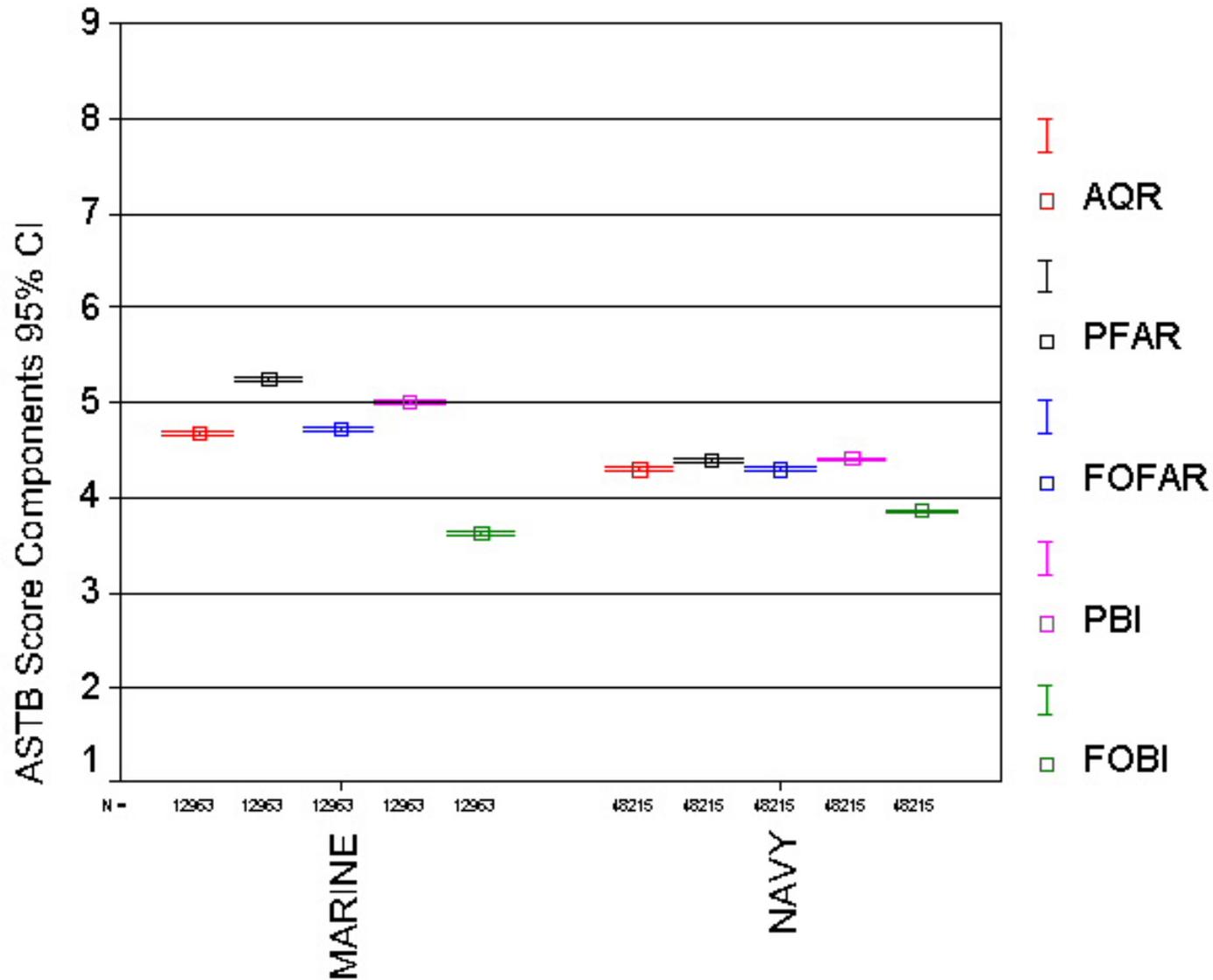
Examinee BI by Test Site



Examinee ASTB by Sex



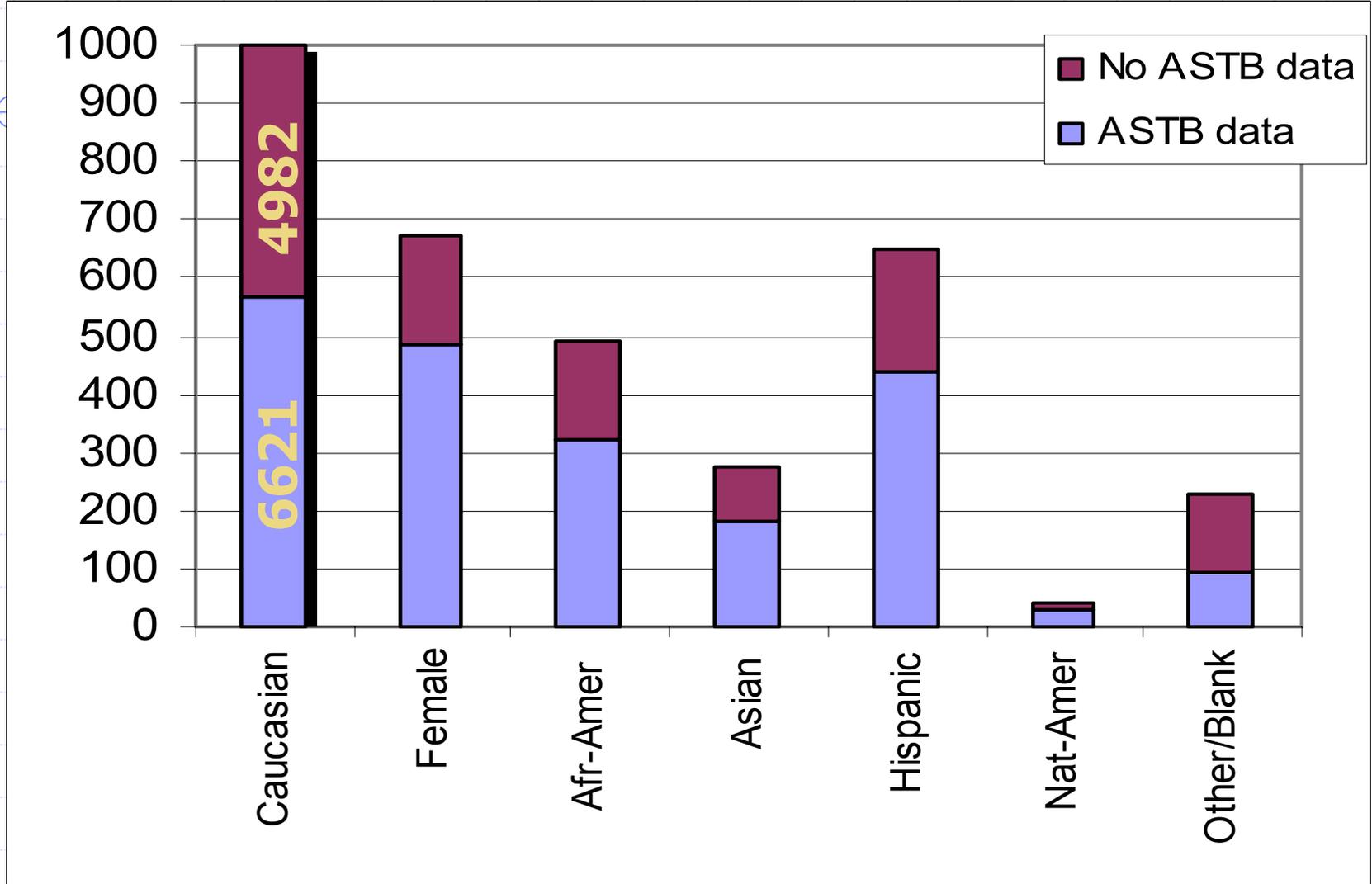
Examinee ASTB by Service



CNATRA data vs. ASTB data

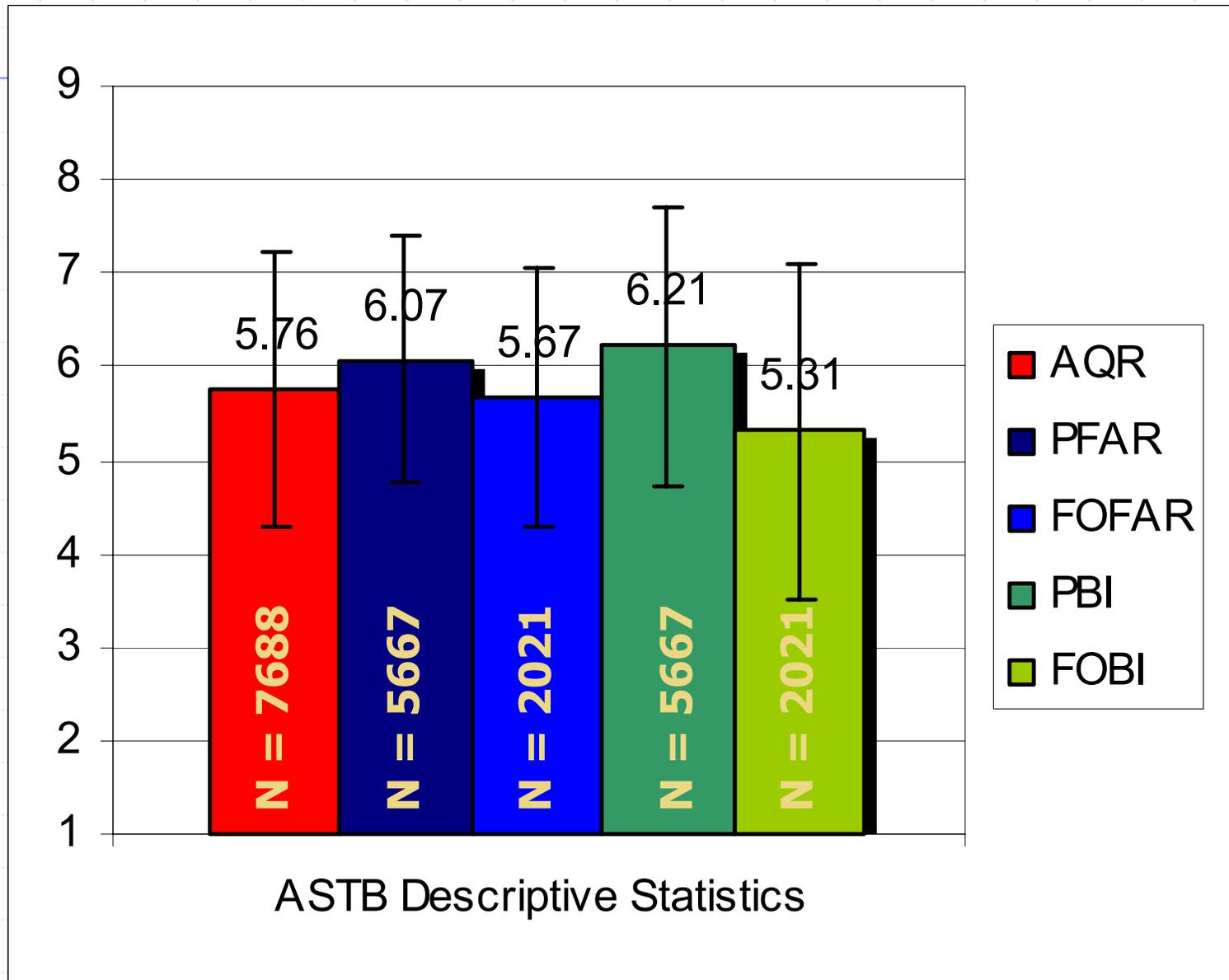
- ◆ Preceding slides have summarized everyone who took the 1992 ASTB
- ◆ Following slides will describe people who took the ASTB and were accepted into Naval flight training
- ◆ Not all flight students in the CNATRA database took the 1992 ASTB
 - 1992 ASTB data on 7688 of 13290 students

CNATRA data vs. ASTB data

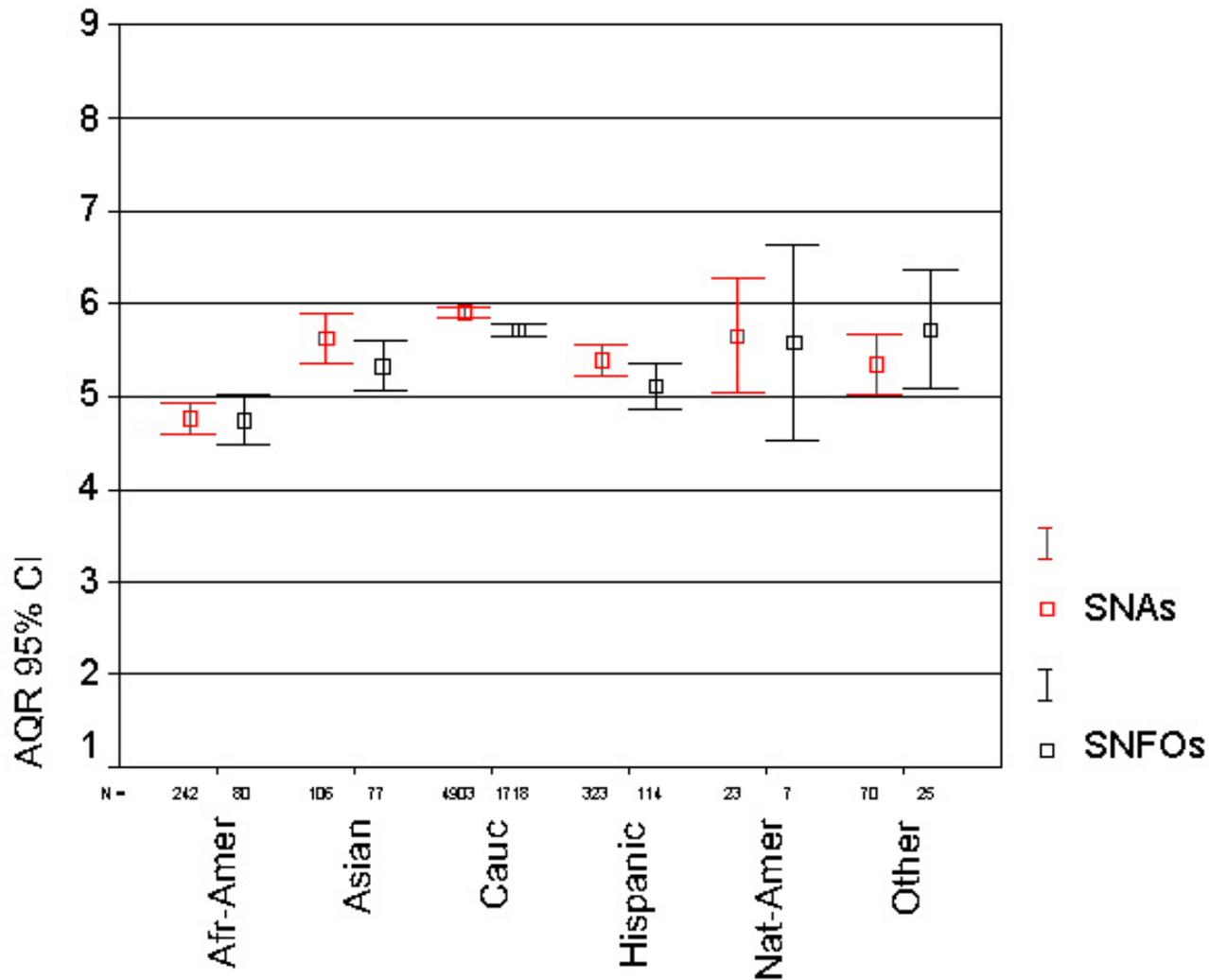


87.3% **5.0%** **3.7%** **2.1%** **4.9%** **0.3%** **1.7%**

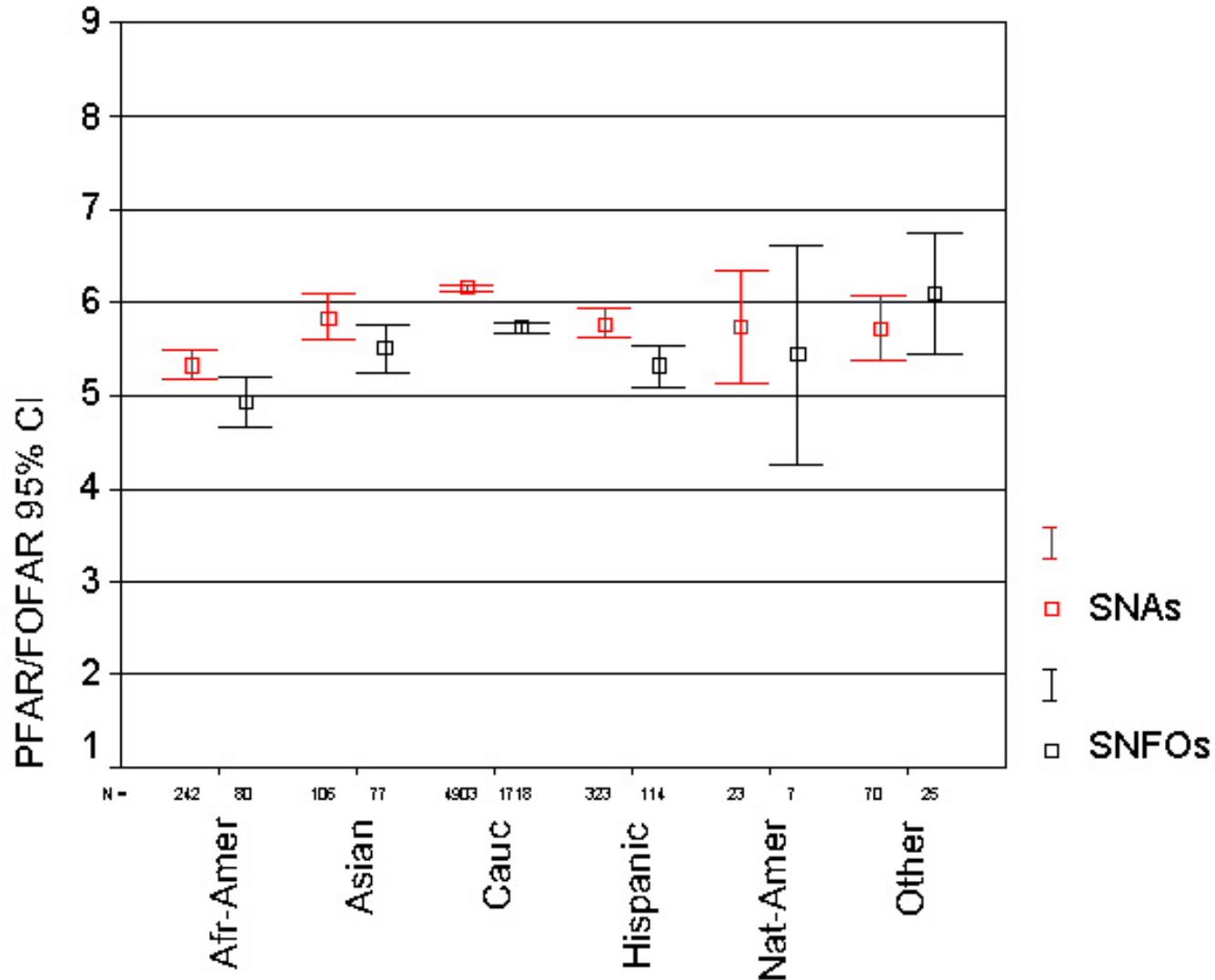
Student ASTB Means



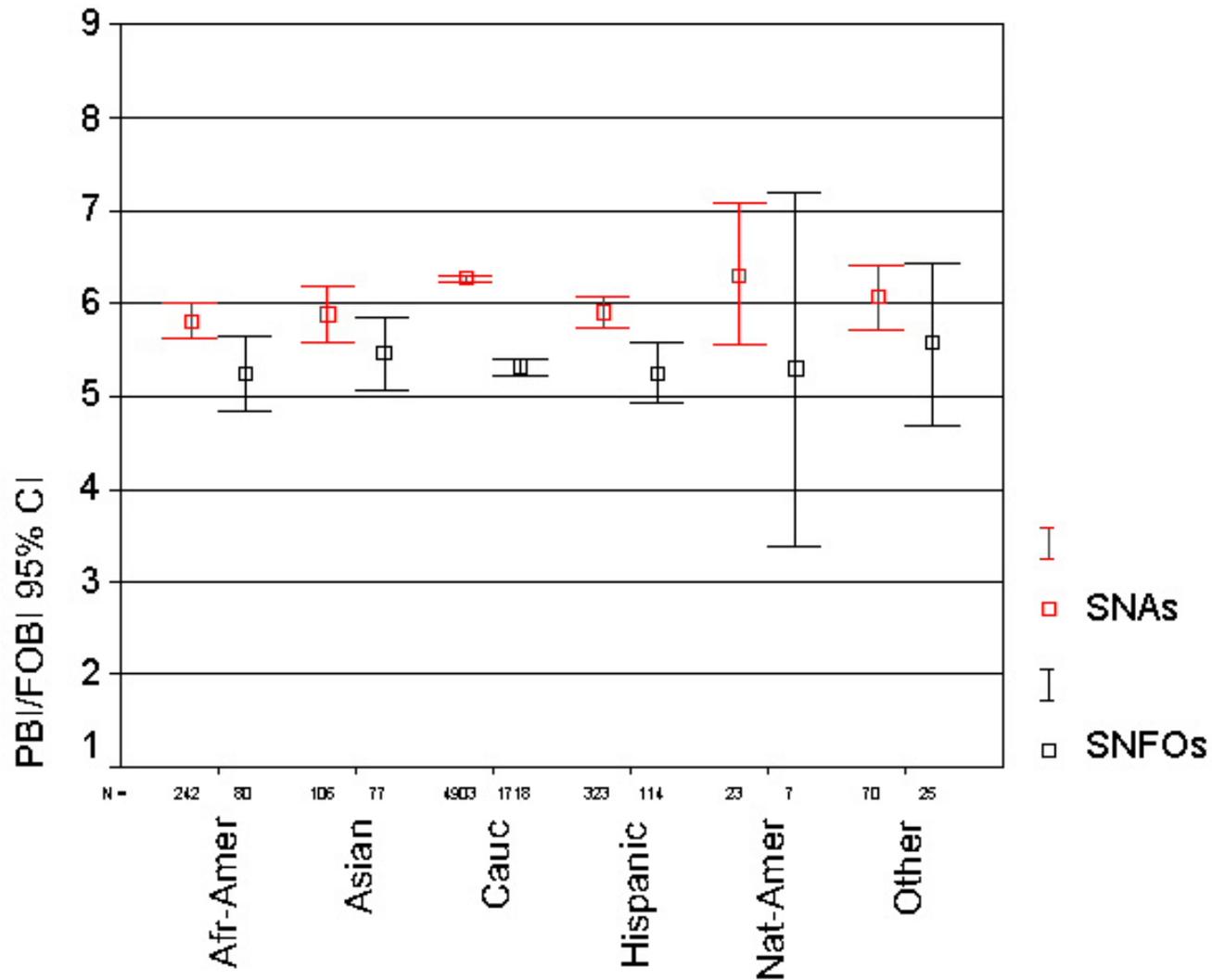
Student AQR by Race & Program



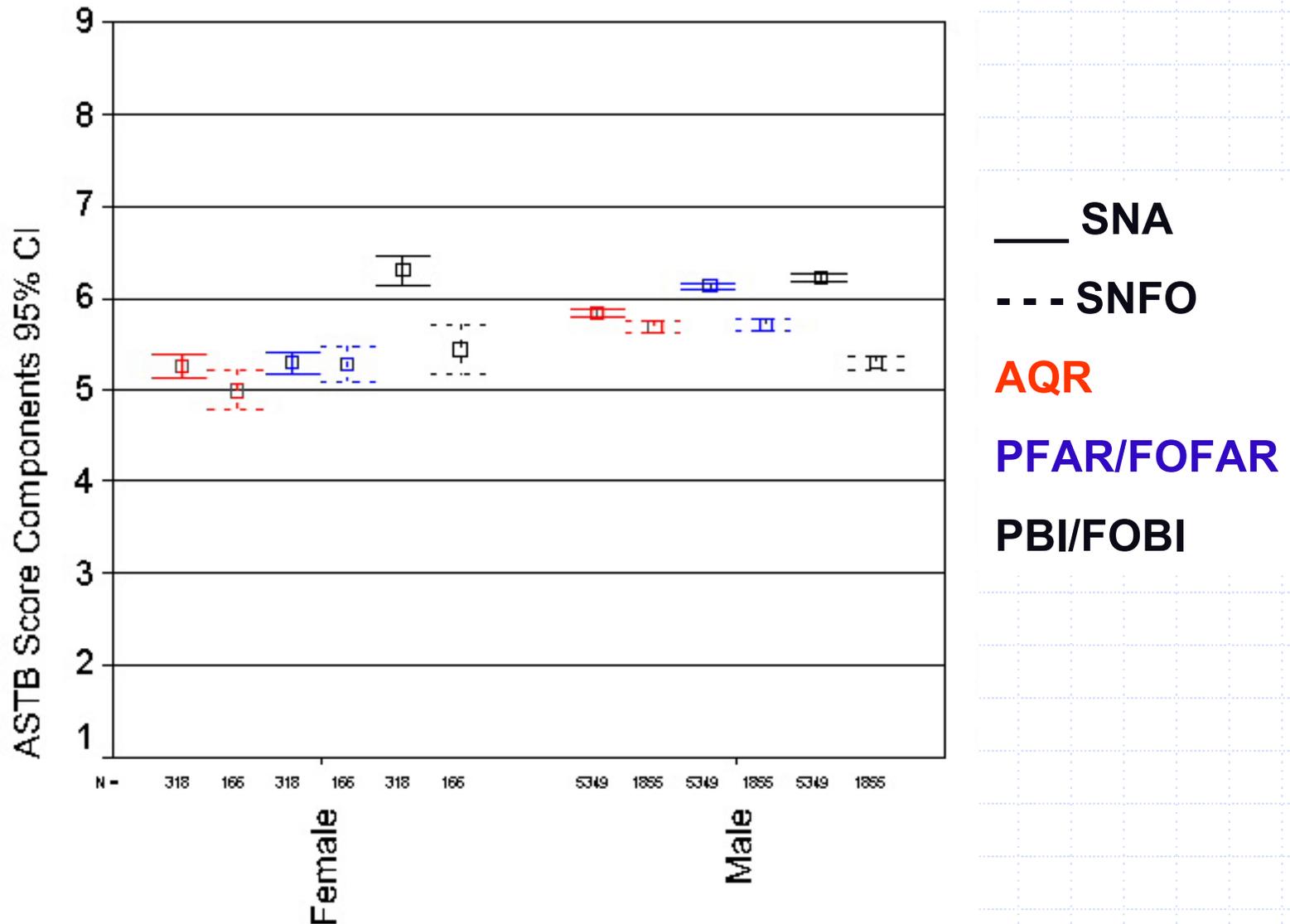
Student FAR by Race & Program



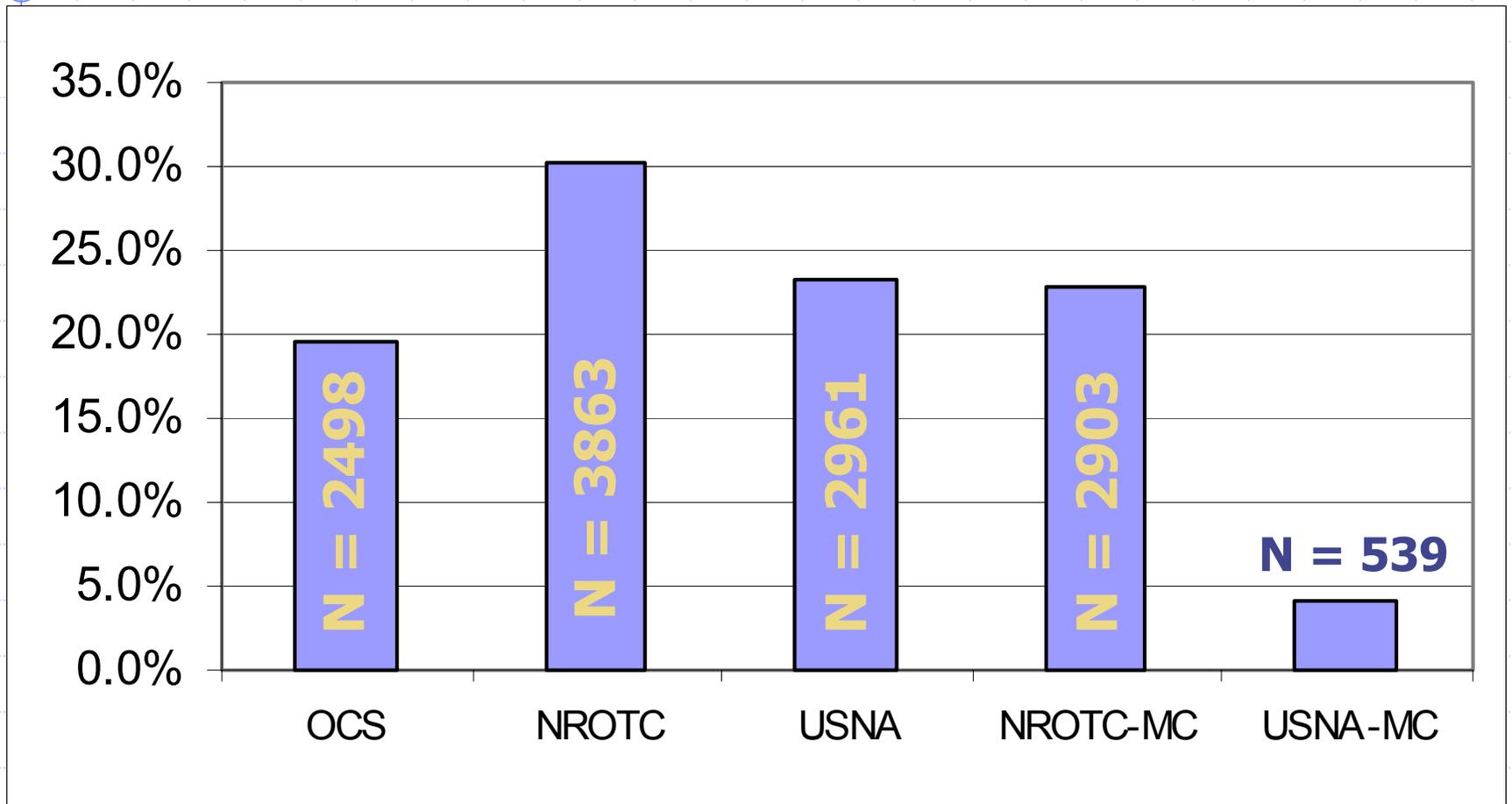
Student BI by Race & Program



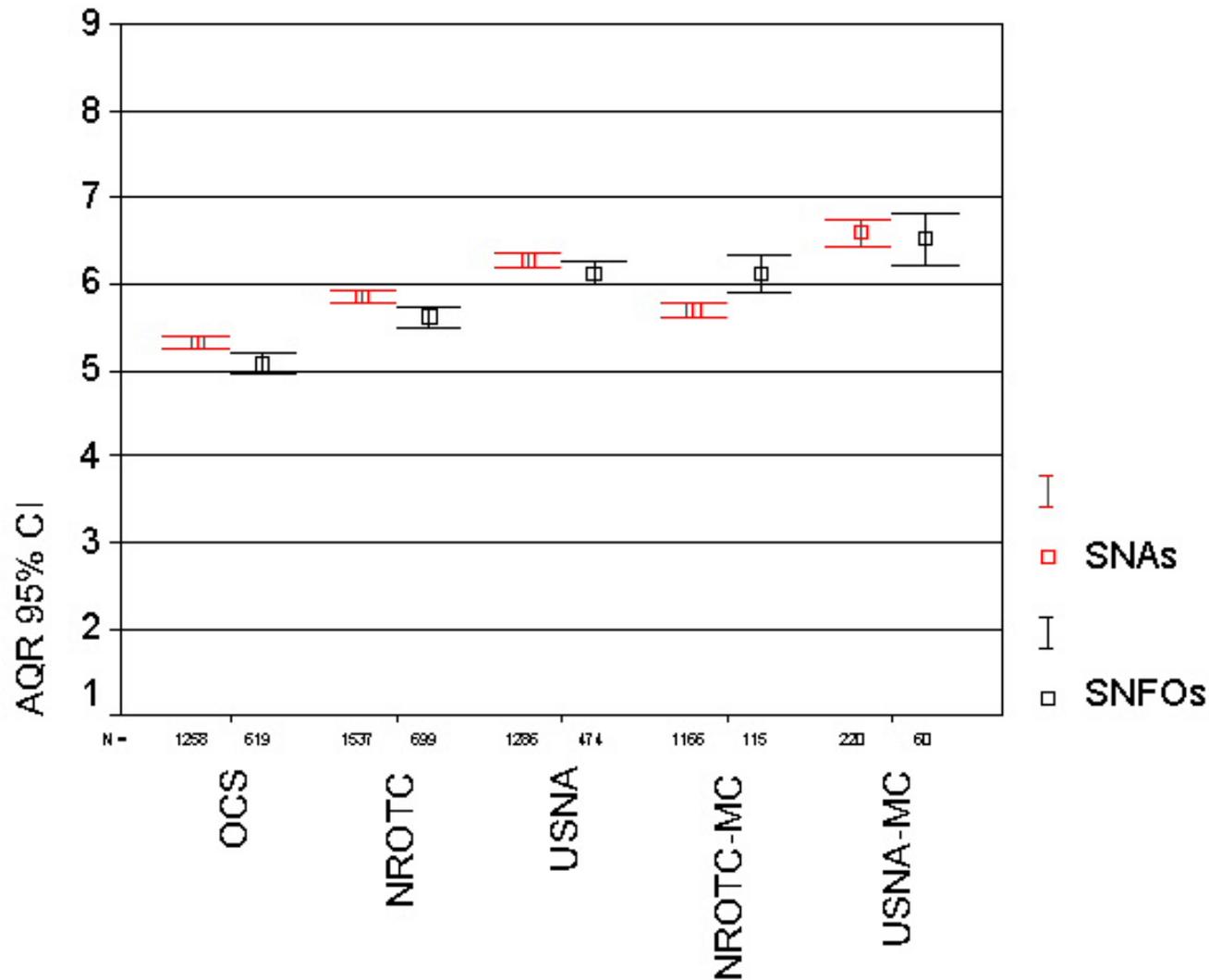
Student ASTB Scores by Sex & Program



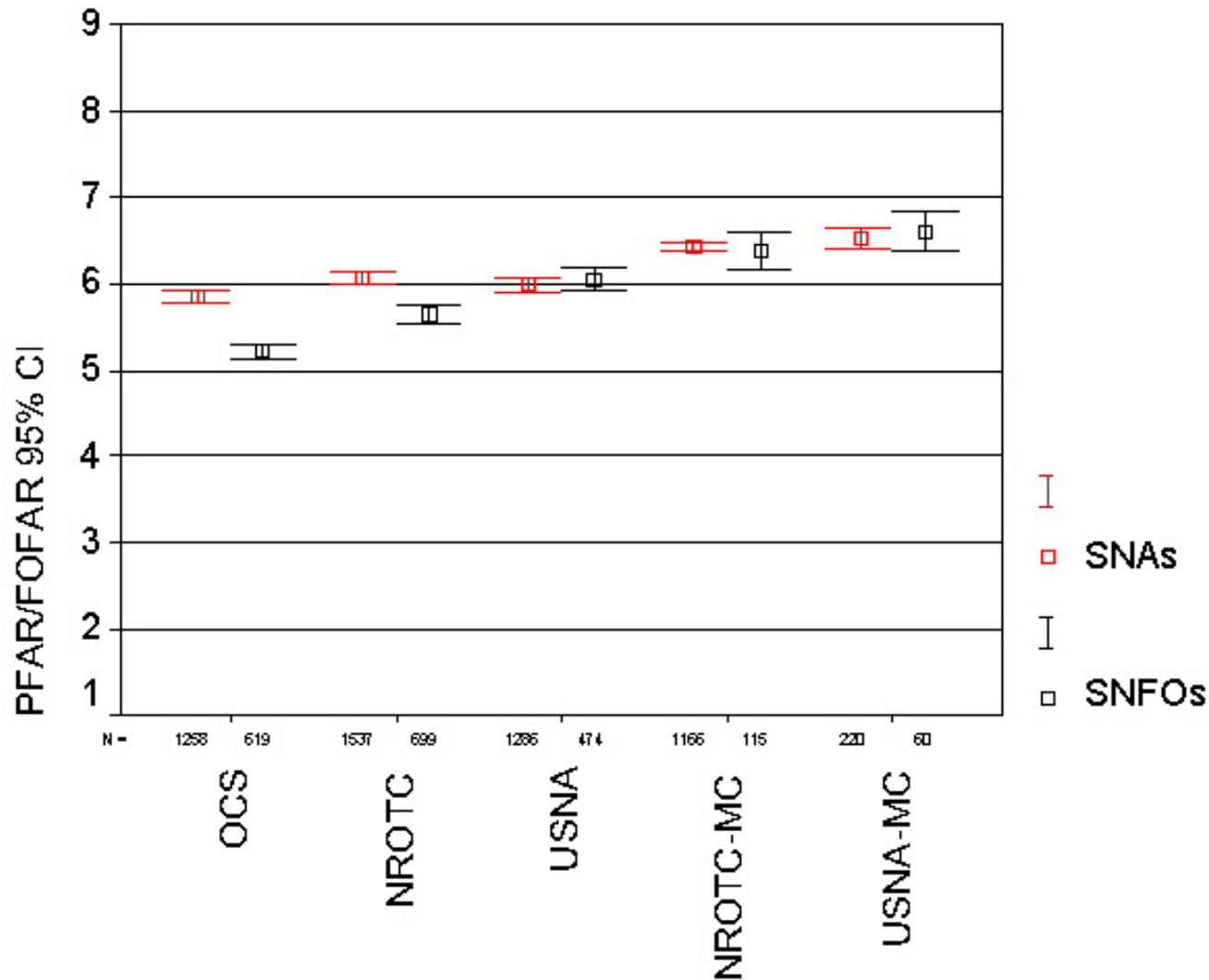
Student Counts by Accession Source



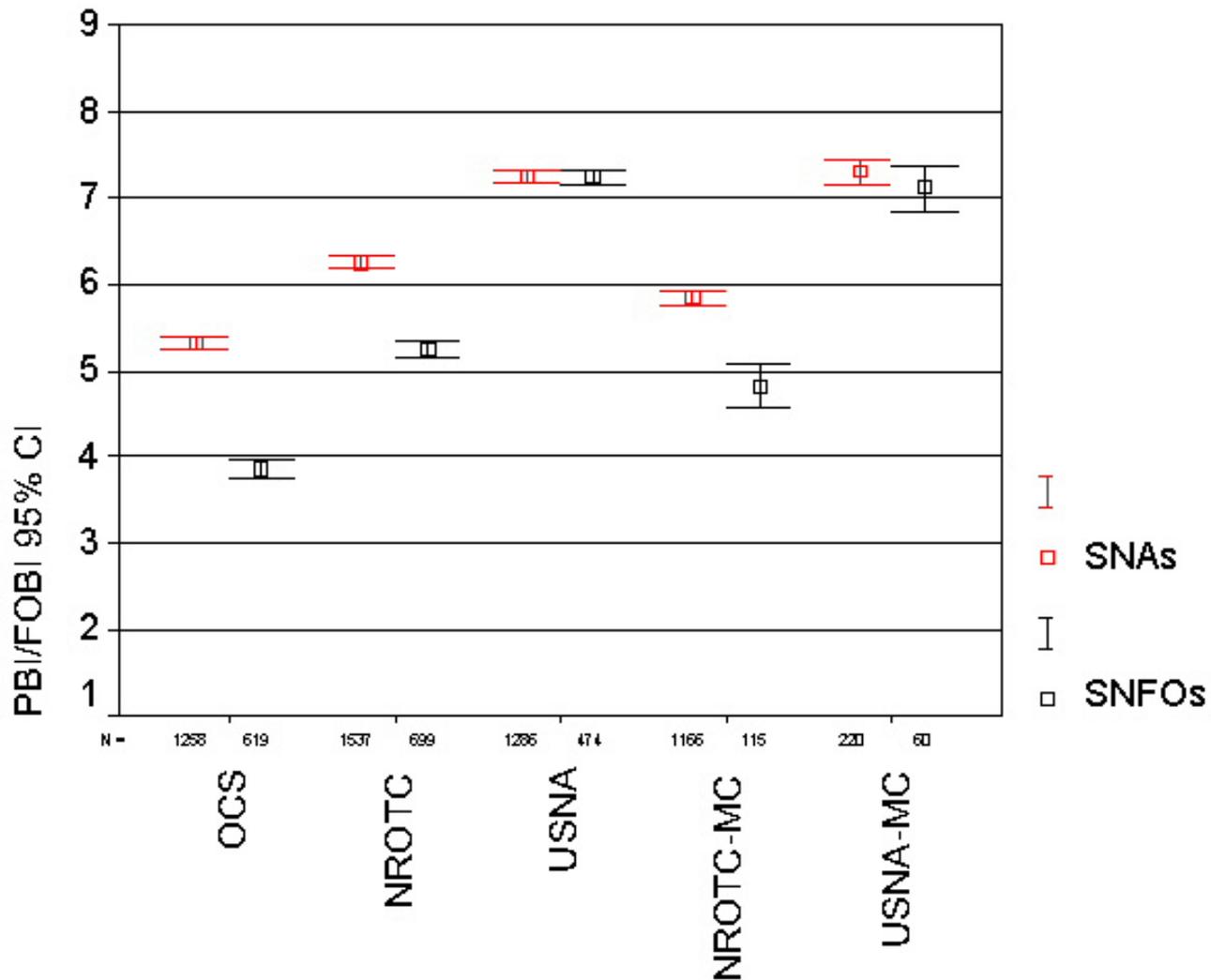
Student AQR by Source & Program



Student FAR by Source & Program



Student BI by Source & Program

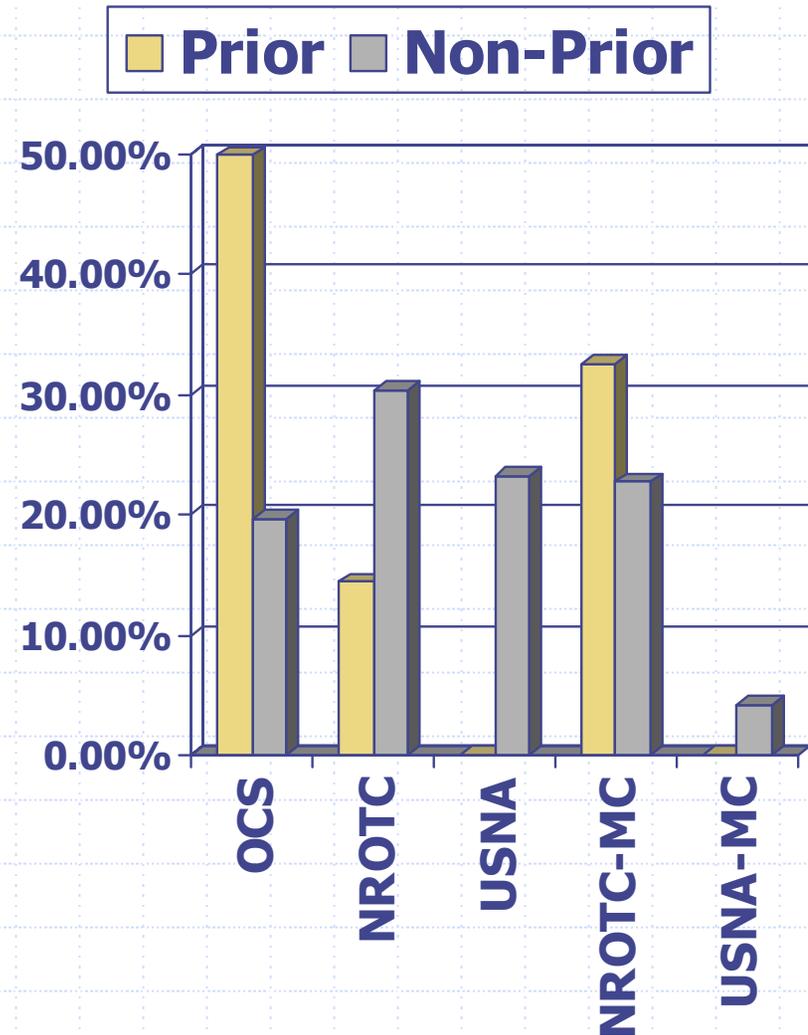


Prior Enlisted, ASTB, & NATC

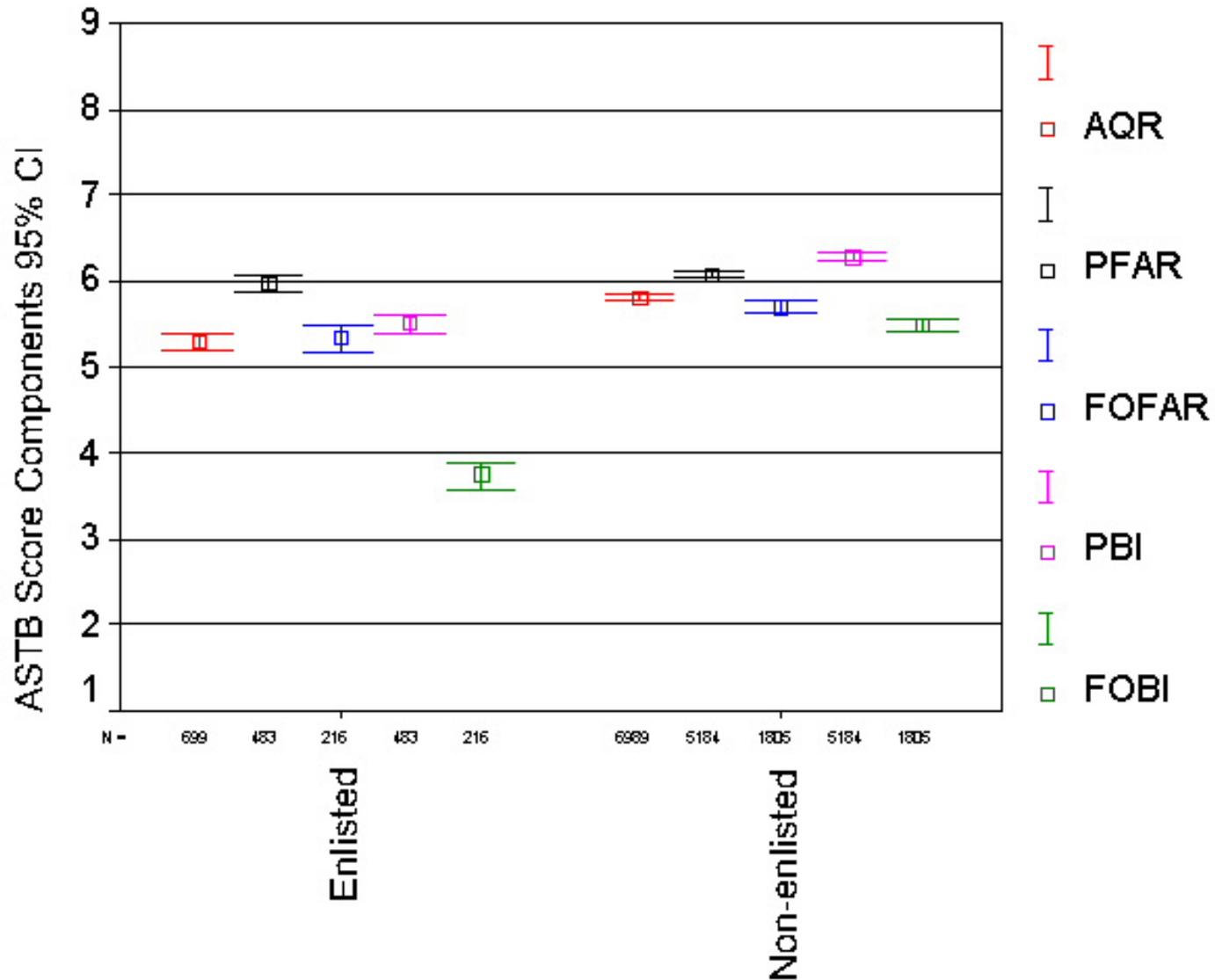
- ◆ ASTB examinees accepted into Naval Flight Training who identified themselves as presently Enlisted on ASTB TAS
- ◆ Group does not include:
 - Priors who left military service before taking ASTB
 - Enlisted who entered USNA/NROTC
- ◆ Group therefore may not be representative of the true Prior Enlisted population

Prior Enlisted, ASTTB, & NATC

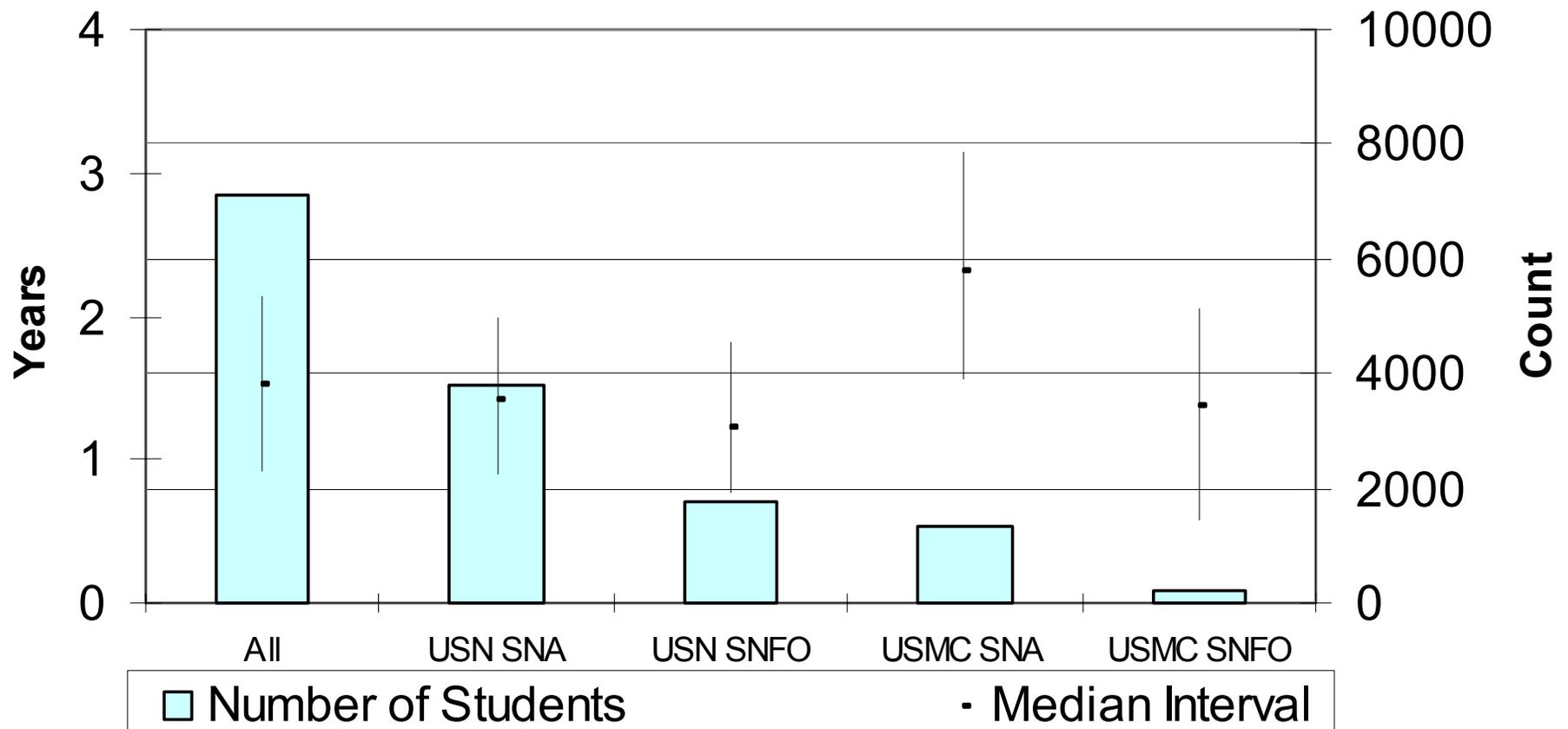
- ◆ Prior N = 699
- ◆ 69% SNAs (483)
- ◆ 64.2% USN (449)
- ◆ 28% attrition (196)



Student ASTB by Status as Prior Enlisted

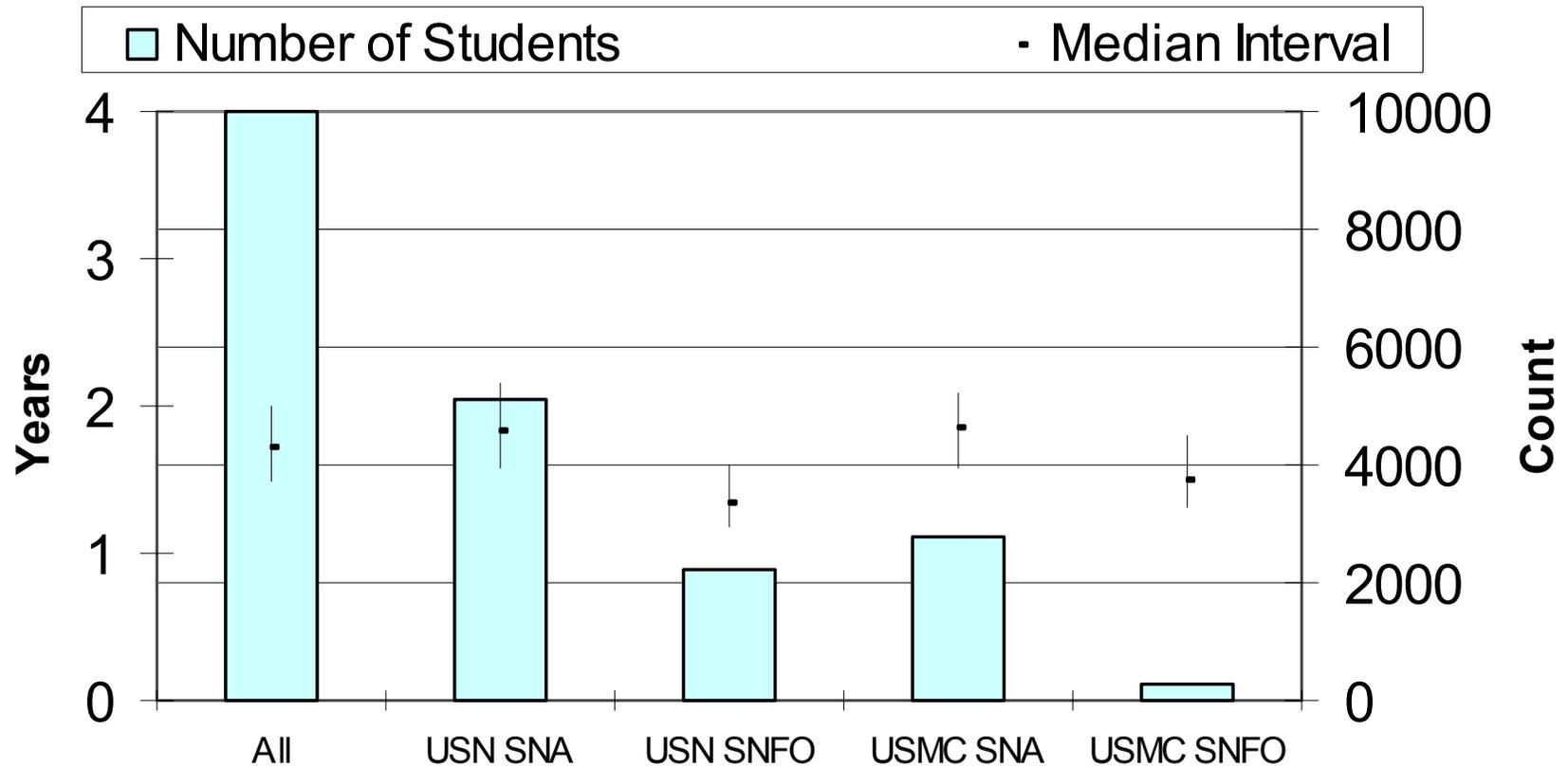


Interval between ASTB Date and NASC Report Date



Range displayed spans 25% and 75% intervals among aviation students

Interval between NASC Report Date and Completion of Training



Range displayed spans 25% and 75% intervals among aviation students

Predictive Relationships with Training Criteria and Attrition

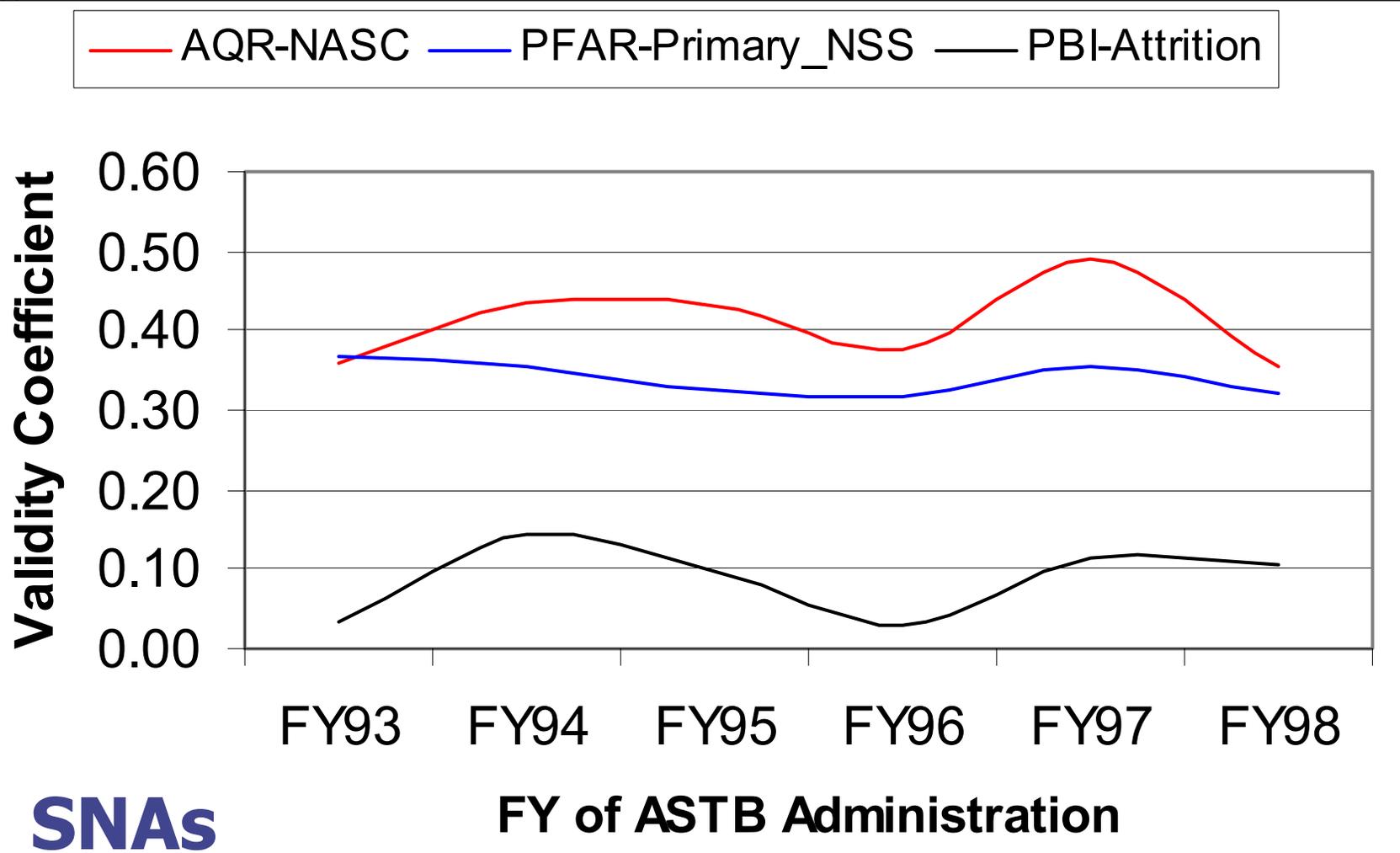
◆ Test Components:

- **AQR:** Predictor of NASC NSS
- **PFAR, FOFAR:** Predictors of Primary NSS
- **PBI, FOBI:** Designed to predict attrition (suspended)

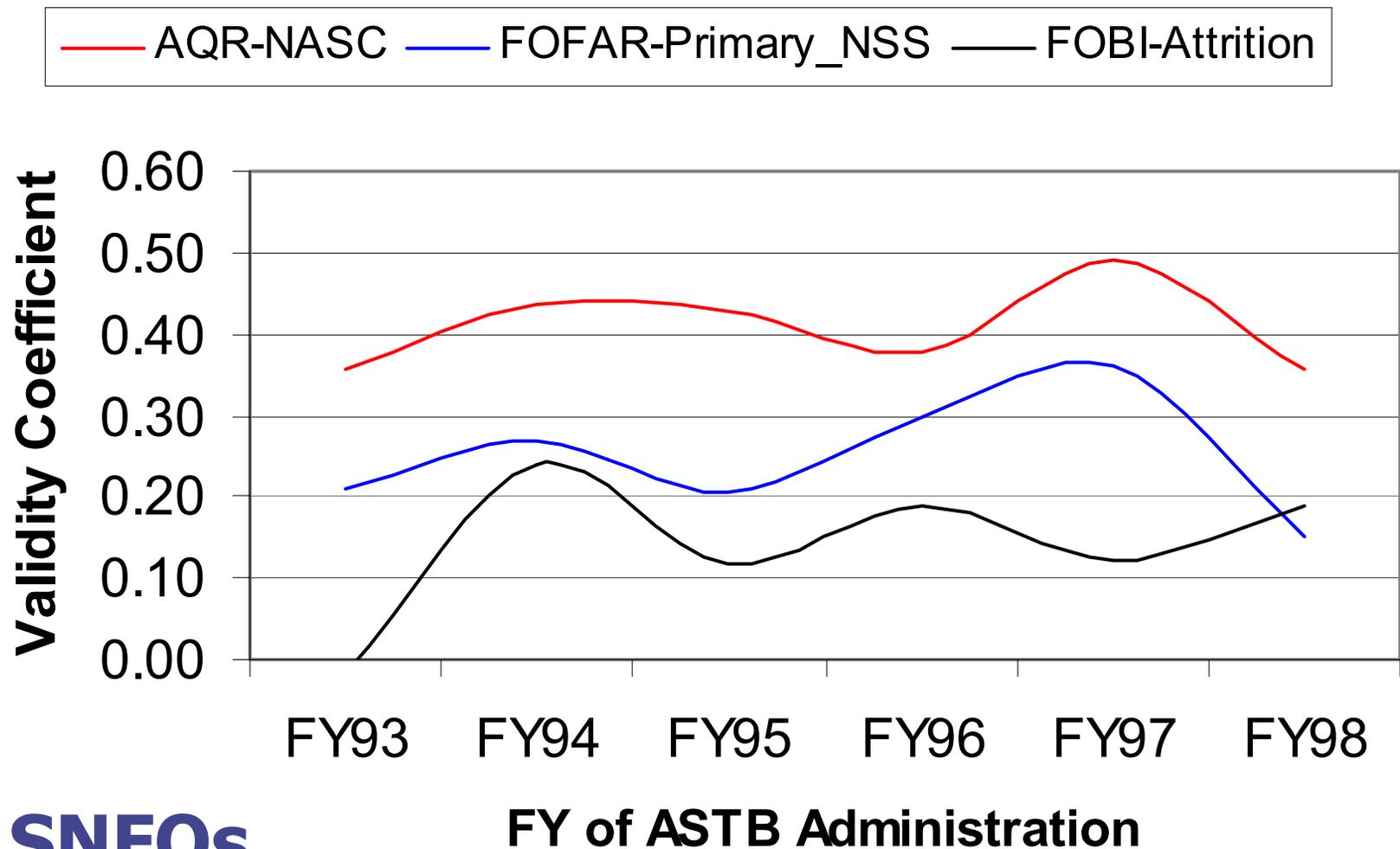
◆ The validity coefficient (higher is better)

◆ Validity data presented for FY93-FY98

ASTB Component Validity by Test FY for Original Criterion Variables



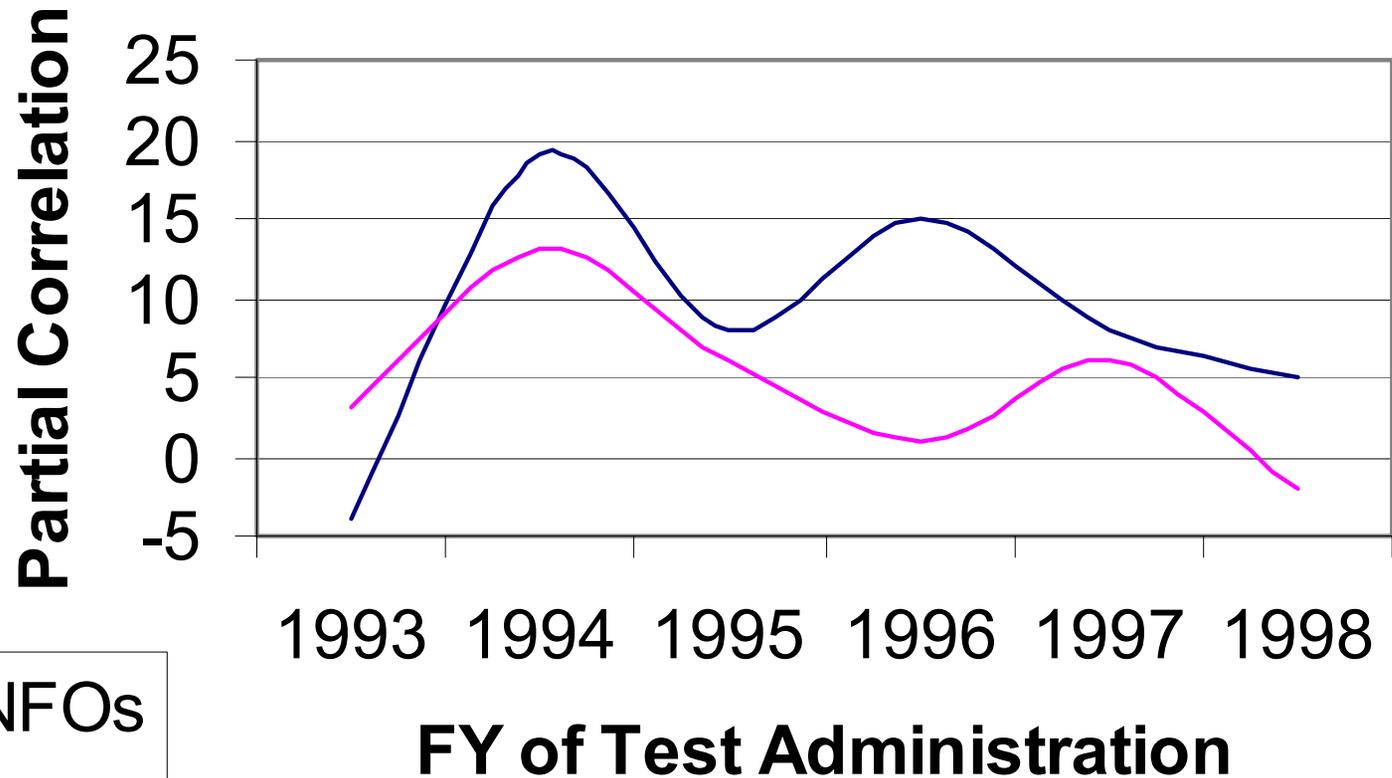
ASTB Component Validity by Test FY for Original Criterion Variables



SNFOs

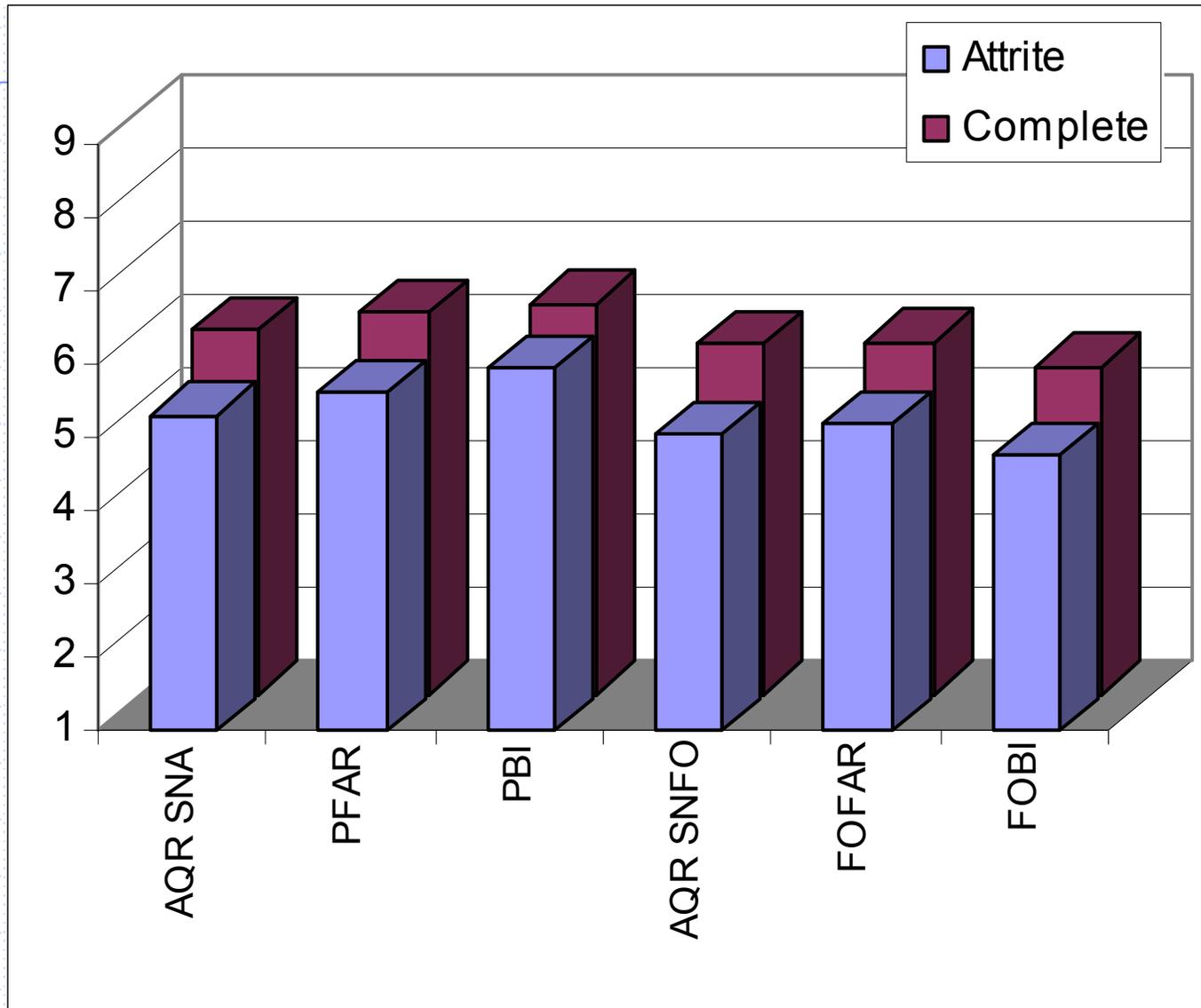
FY of ASTB Administration

PBI/FOBI Validity in Predicting Attrition Controlling for AQR & PFAR/FOFAR



— NFOs
— Pilots

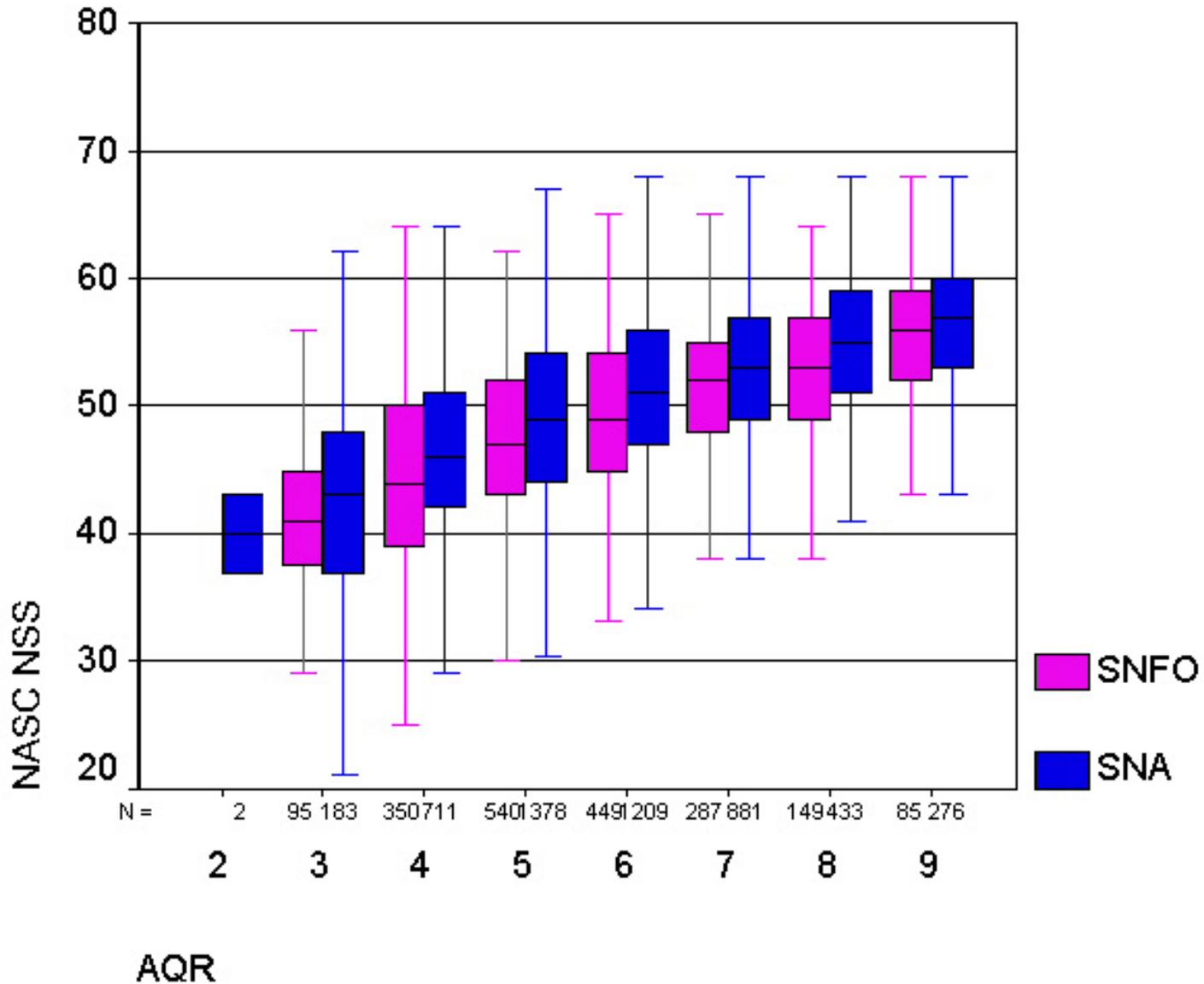
Attrite Status by Student ASTB



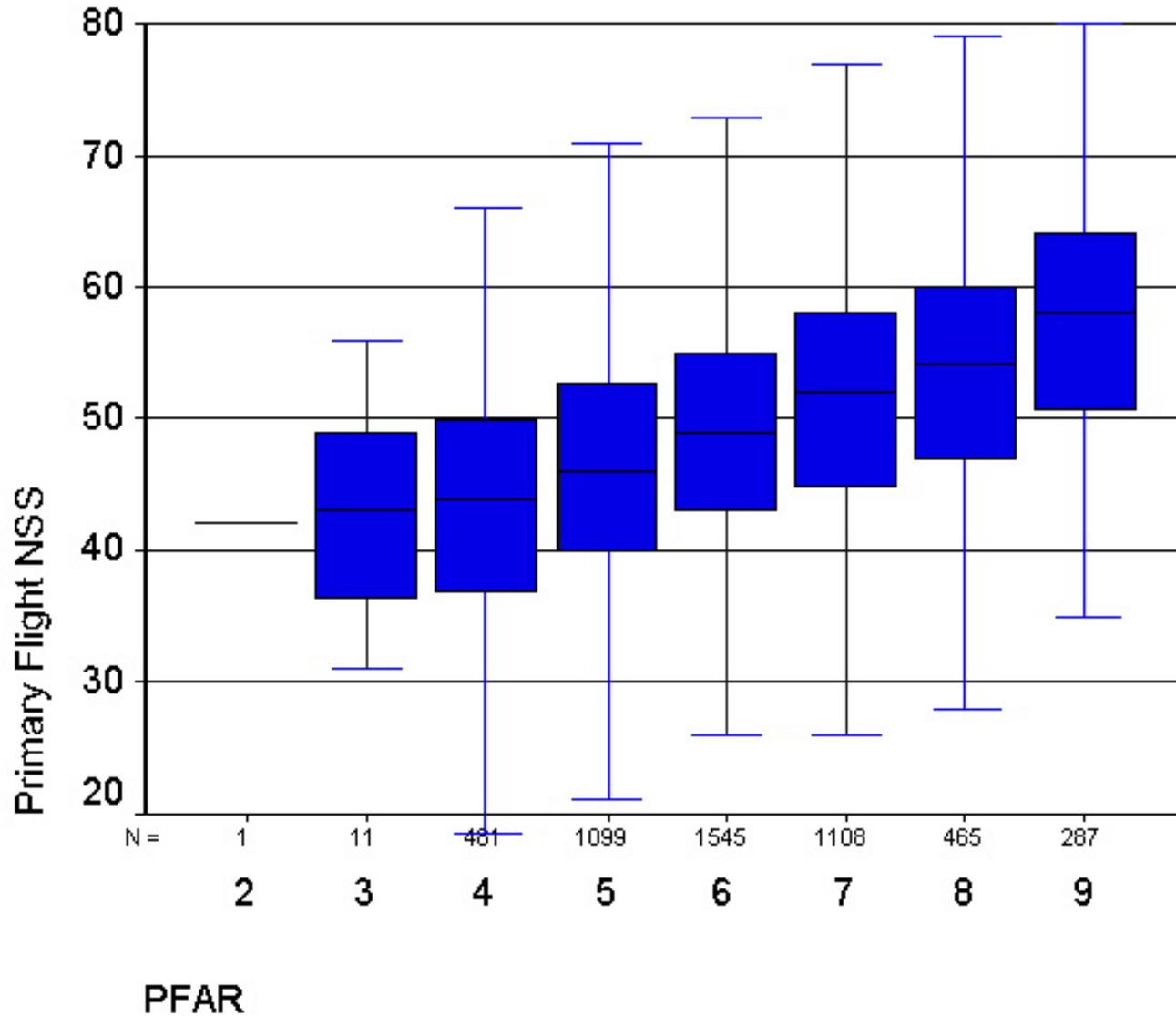
BI Suspension Status

- ◆ 1 MAR 02 BUMED recommended suspension of the BI portions of the ASTB for SNA/SNFO selection
- ◆ 22 APR 02 BI suspended for Navy ASTBs
- ◆ 26 APR 02 BI suspended for USMC ASTBs
- ◆ USCG has suspended BI portions of the ASTB, date TBD

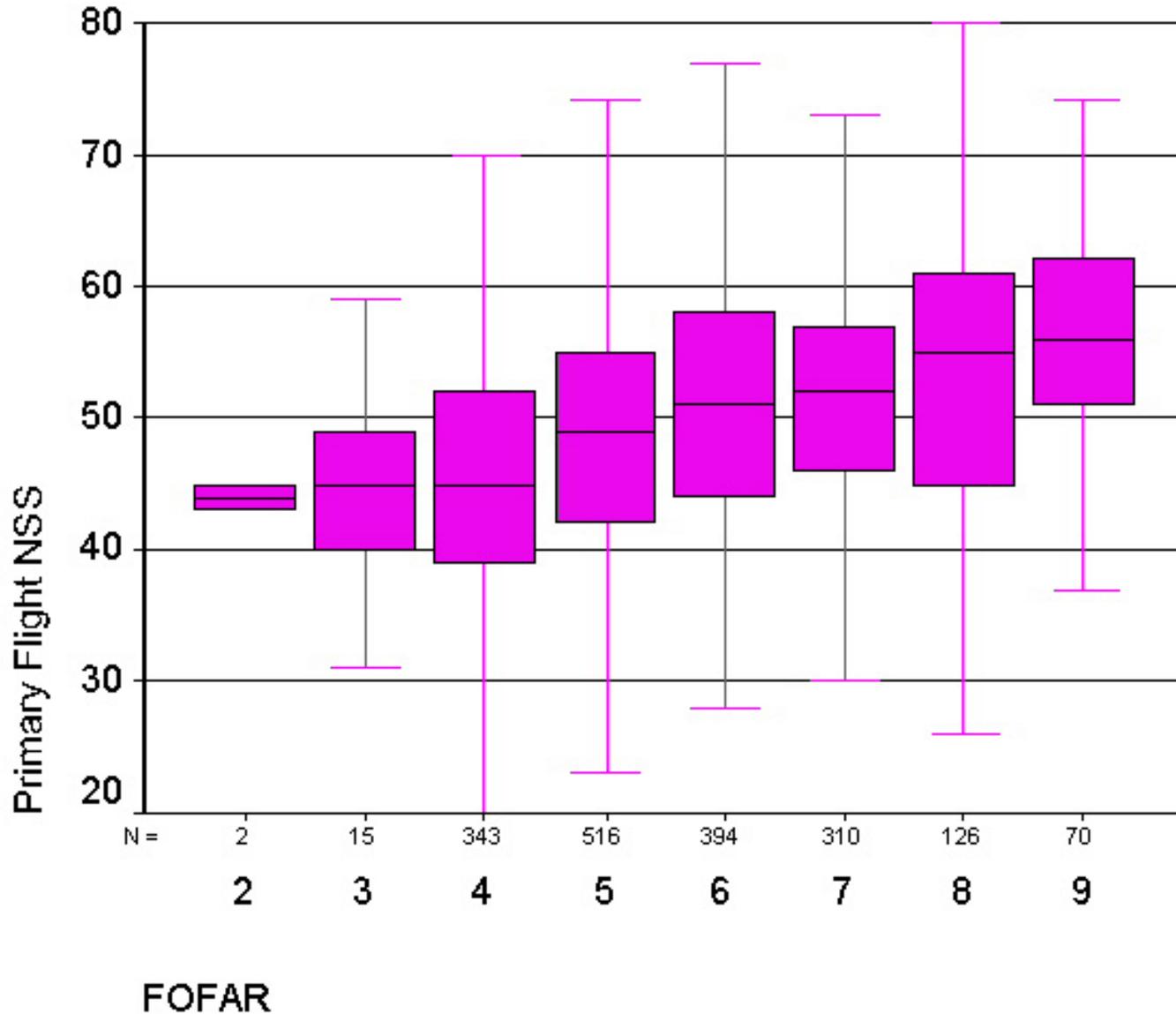
NASC NSS by AQR and Program



Primary NSS by PFAR



Primary NSS by FOFAR

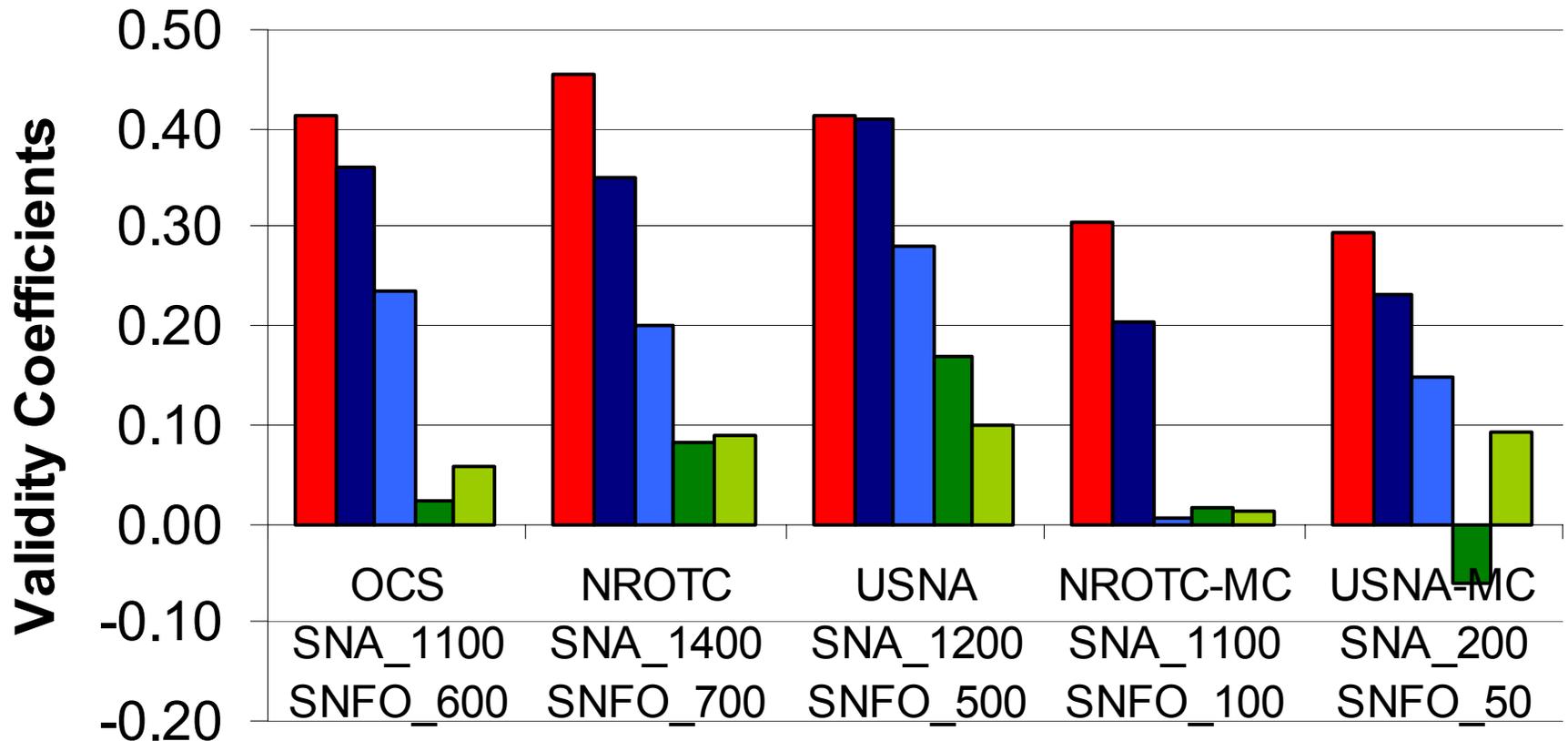


ASTB and USMC Field Flight Performance Boards

- ◆ Old ASTB Components AQT and FAR have been found to predict subjection to FFPB among USMC aviators
- ◆ Mean differences were identified on both components

ASTB Component Validity by Source for Original Criterion Variables

■ AQR-NASC
 ■ PFAR-Pri
 ■ FOFAR-Pri
 ■ PBI-Attr
 ■ FOBI-Attr

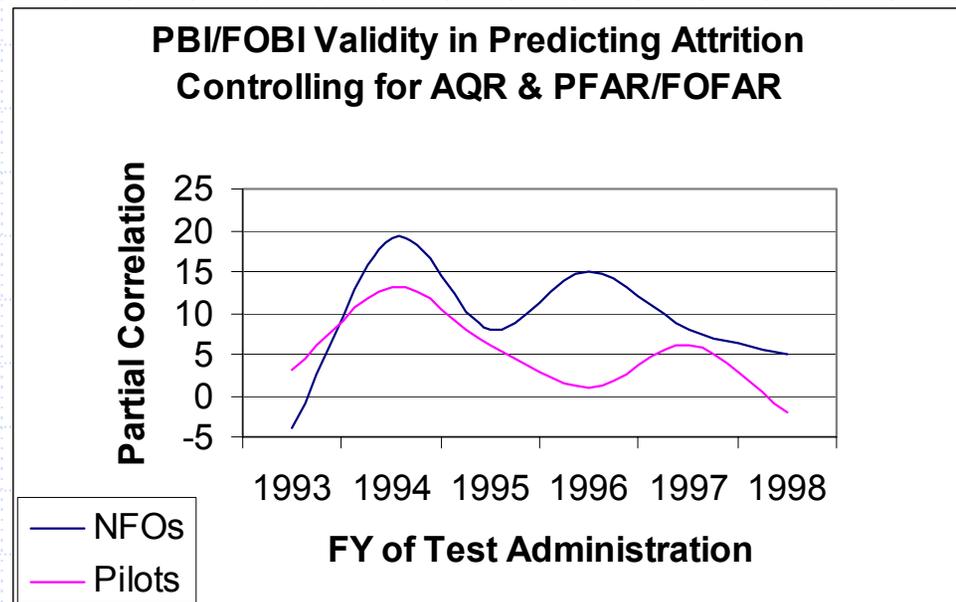


Suspension of the BI

- ◆ Biographical Inventory Scales (Pilot BI (PBI) and NFO BI (FOBI)) were developed to predict training attrition
- ◆ Although these tests were once powerful predictors of attrition, their predictive validity has been in decline over a period of years

Background

- ◆ In recent years these tests' predictive validity has declined essentially to zero



- ◆ Other ASTB measures (AQR/PFAR/FOFAR) remain highly predictive of training outcomes, including attrition

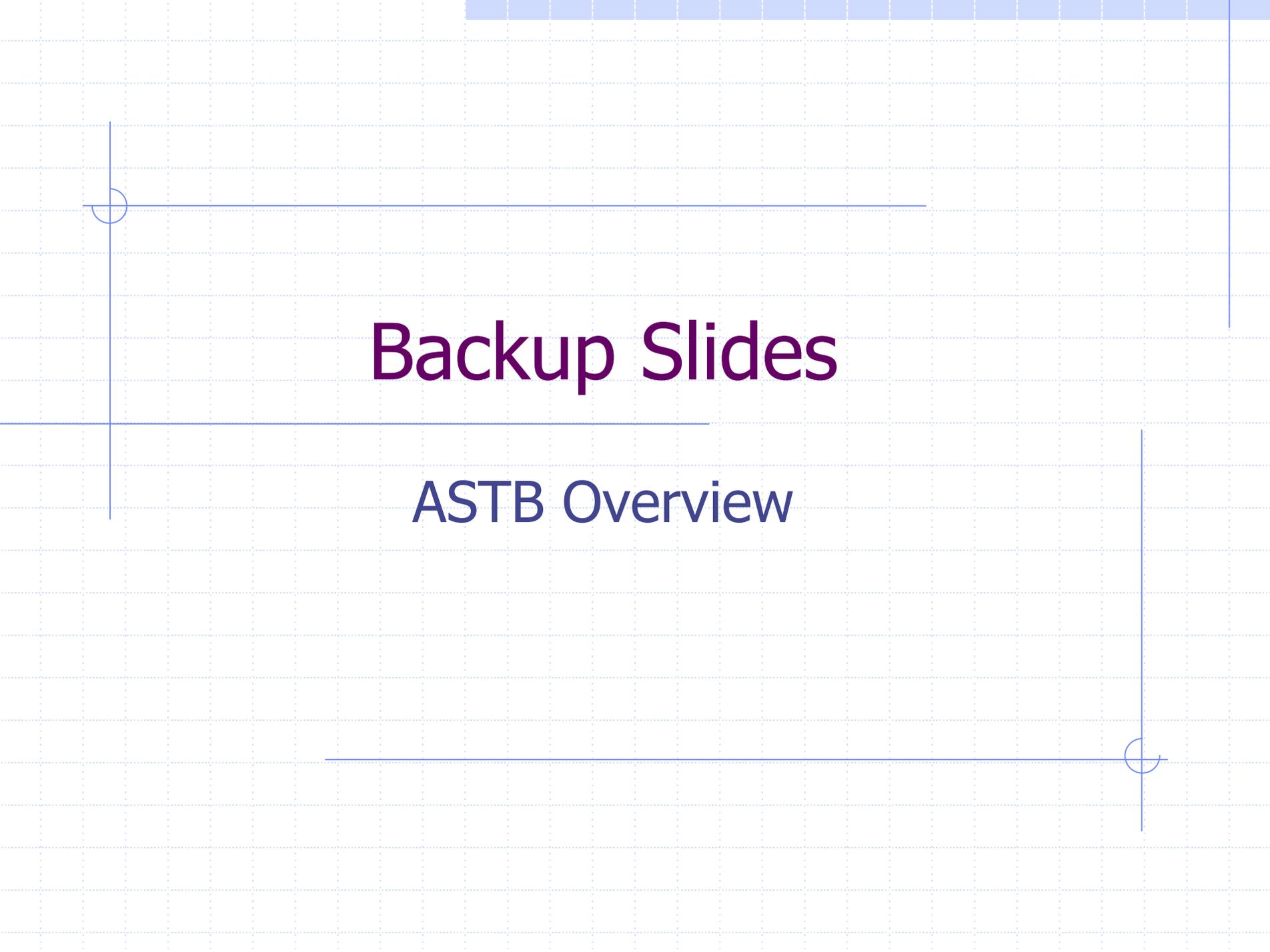
Possible Causes of Decline in Predictive Validity of PBI and FOBI

- ◆ Changes in applicant population
- ◆ Changes in criterion predicted by test
- ◆ Test coaching by test administrators
- ◆ “Gaming” the test by applicants

Contact Information

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- ◆ FAX (850) 452-2144 (DSN 922-)
- ◆ h1phillips@nomi.med.navy.mil

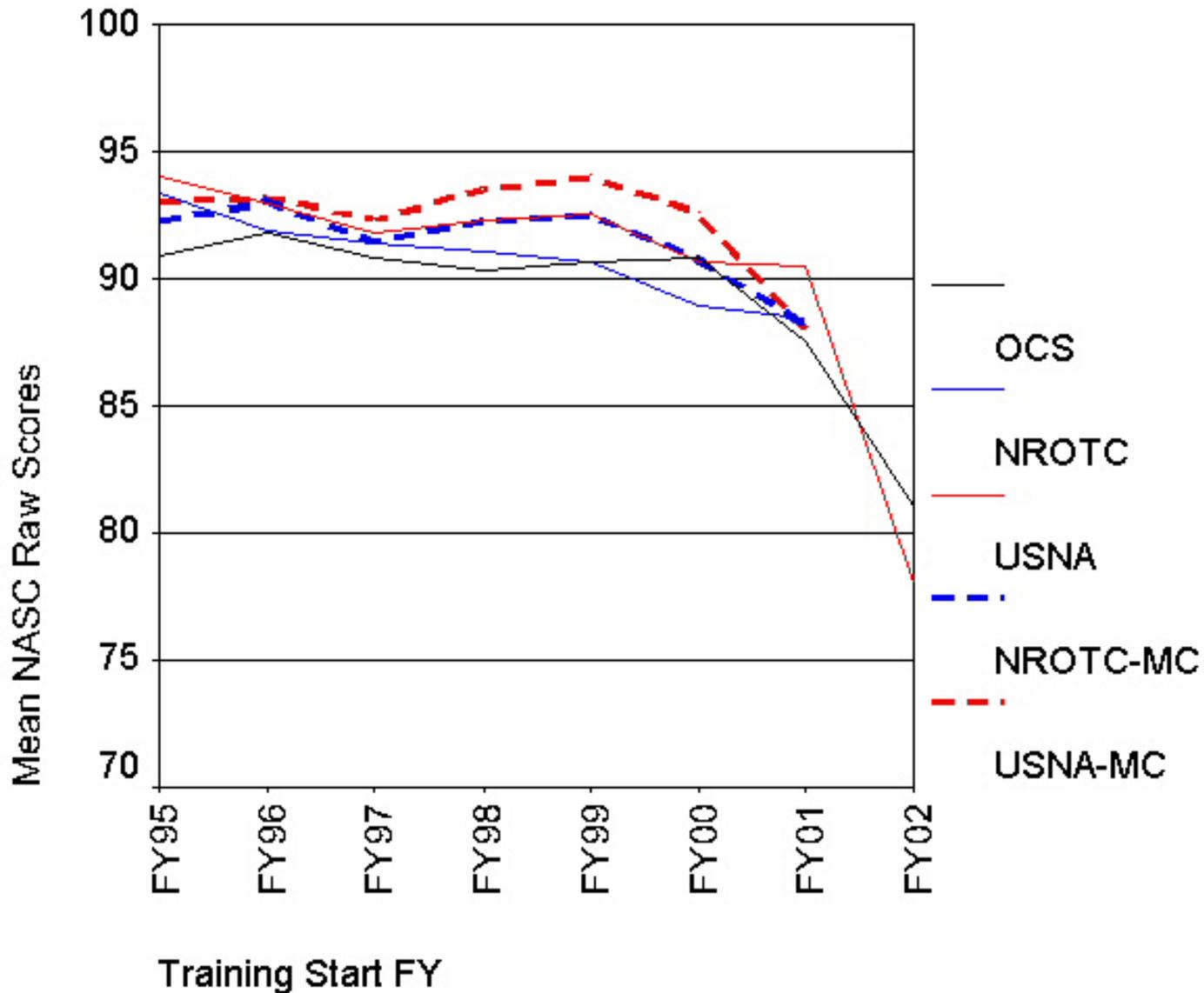




Backup Slides

ASTB Overview

NASC Raw Scores by Source



ASTB Retest Rates

25JUN02

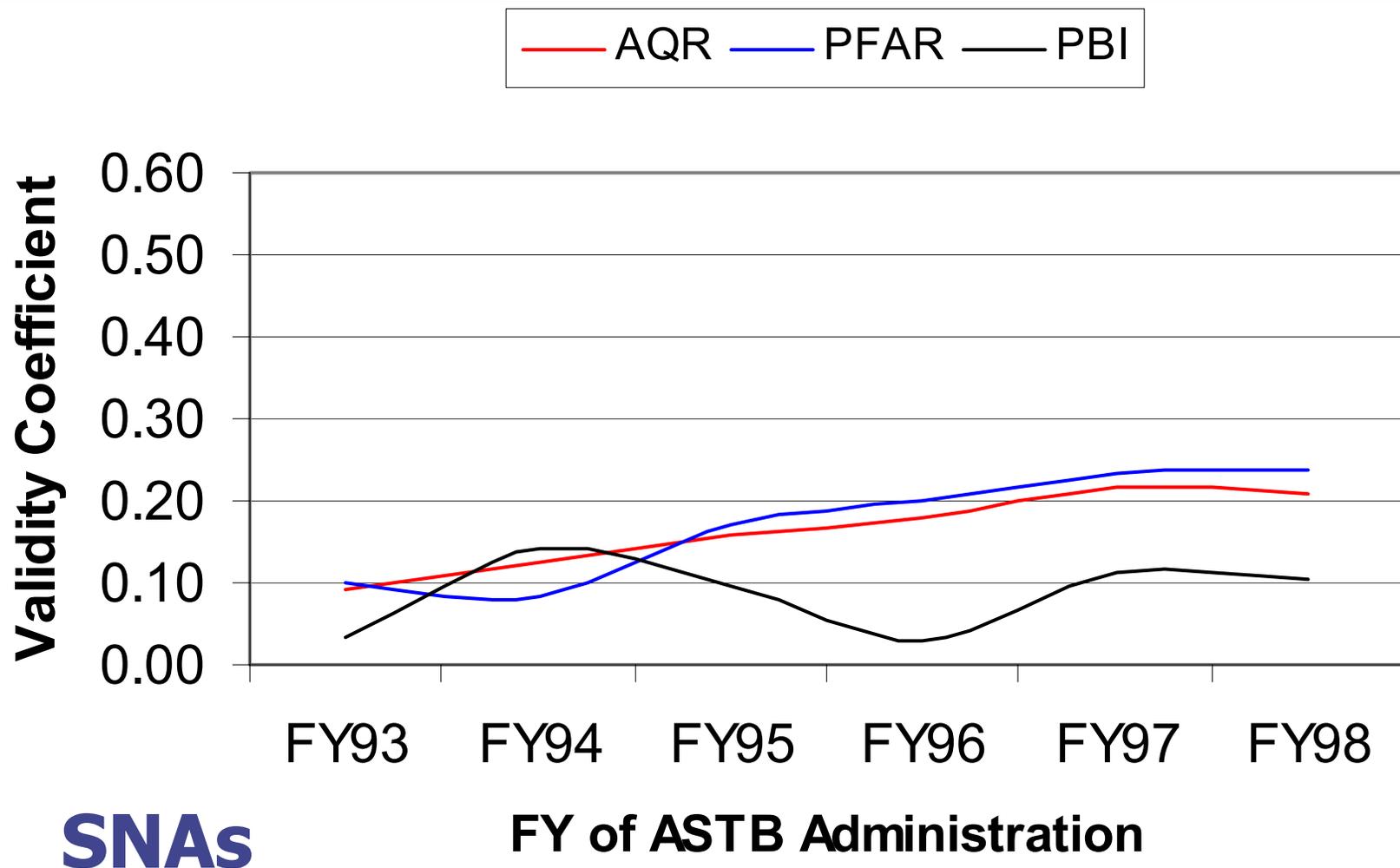
- ◆ ASTB administrations by FY (Total = 75756)
- ◆ ASTB retests by FY (Total = 14578)
- ◆ Current ASTB scores by FY (Total = 61178)
 - As of 25JUN02

	All ASTBs	Retests	Current
FY93	5233	865	4368
FY94	5098	915	4183
FY95	6400	1436	4964
FY96	7476	1790	5686
FY97	9067	2125	6942
FY98	9134	1915	7219
FY99	8280	1798	6482
FY00	7943	1469	6474
FY01	8830	1446	7384
FY02	8292	819	7473
Total	75756	14578	61178

CNATRA data vs. ASTB data

<u>NASC Rep</u>					% missing
Date	CNATRA	ASTB	Delta		ASTB
Missing	580	464	116		20.0%
preFY93	2403	32	2371		98.7%
FY93	935	14	921		98.5%
FY94	1179	88	1091		92.5%
FY95	1601	901	700		43.7%
FY96	1409	1183	226		16.0%
FY97	1622	1521	101		6.2%
FY98	1345	1321	24		1.8%
FY99	1136	1108	28		2.5%
FY00	898	874	24		2.7%
FY01	166	163	3		1.8%
TOTAL	13274	7668	5605		42.2%

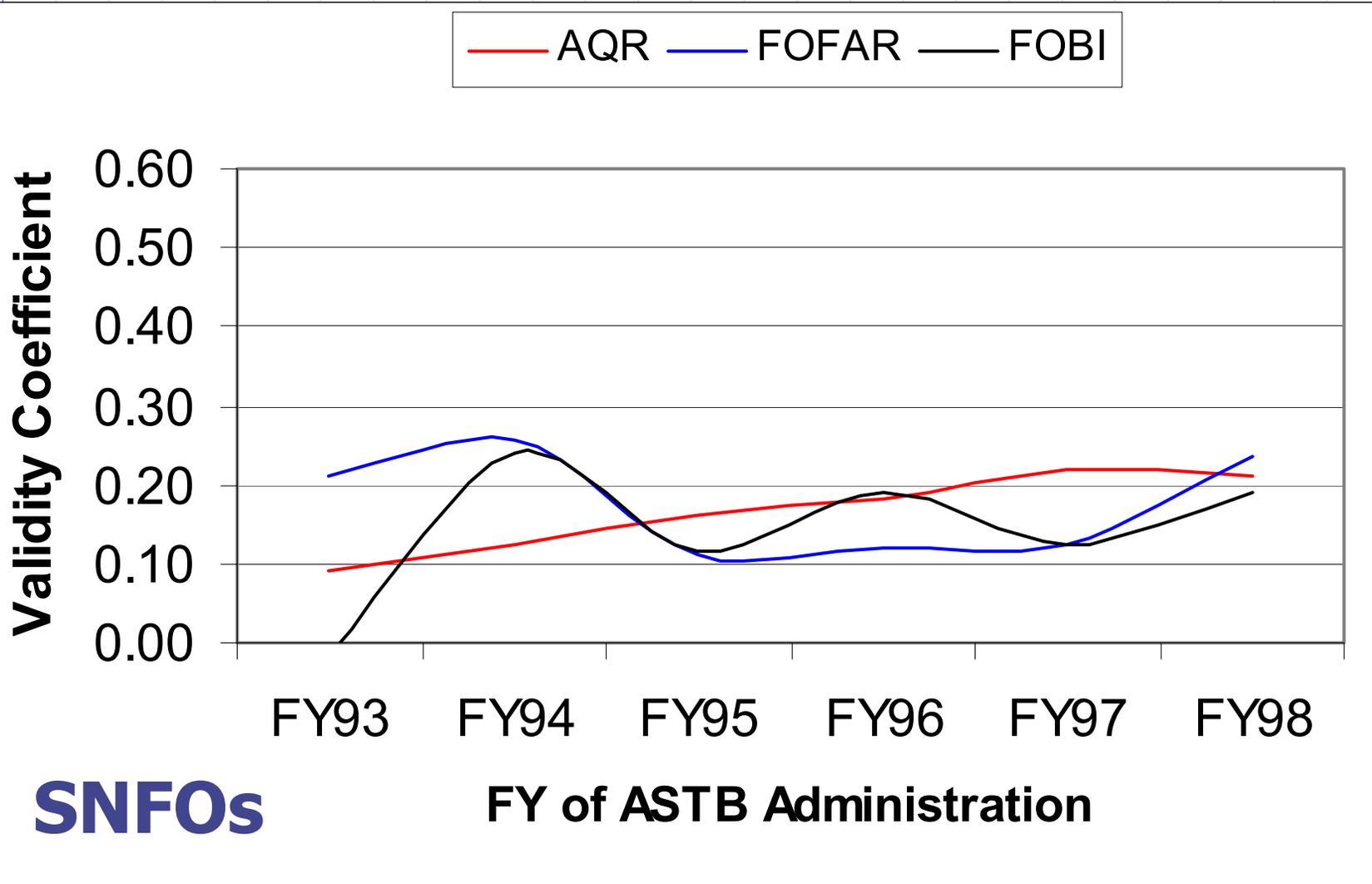
ASTB Component Validity by Test FY for Attrition Only



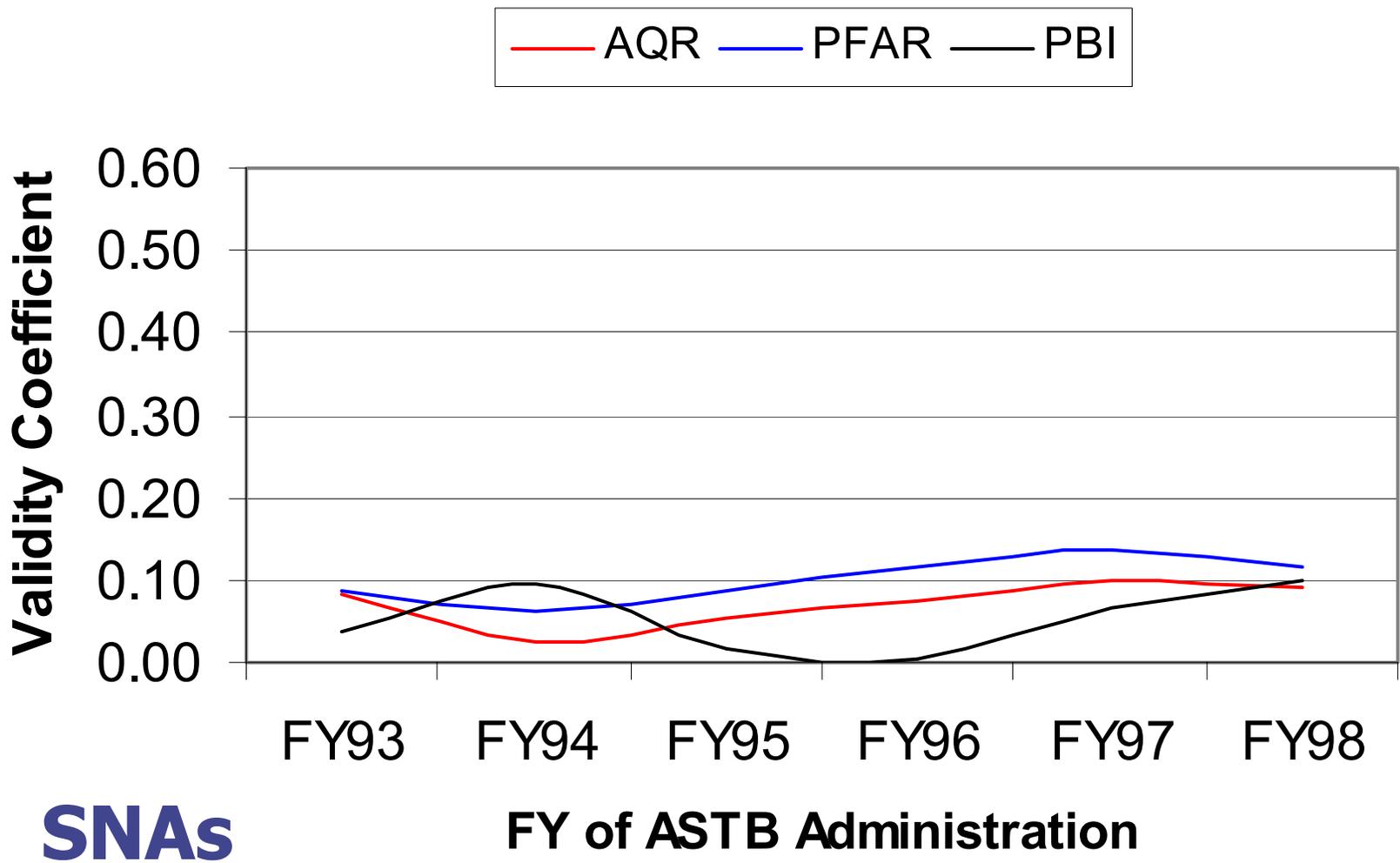
SNAs

FY of ASTB Administration

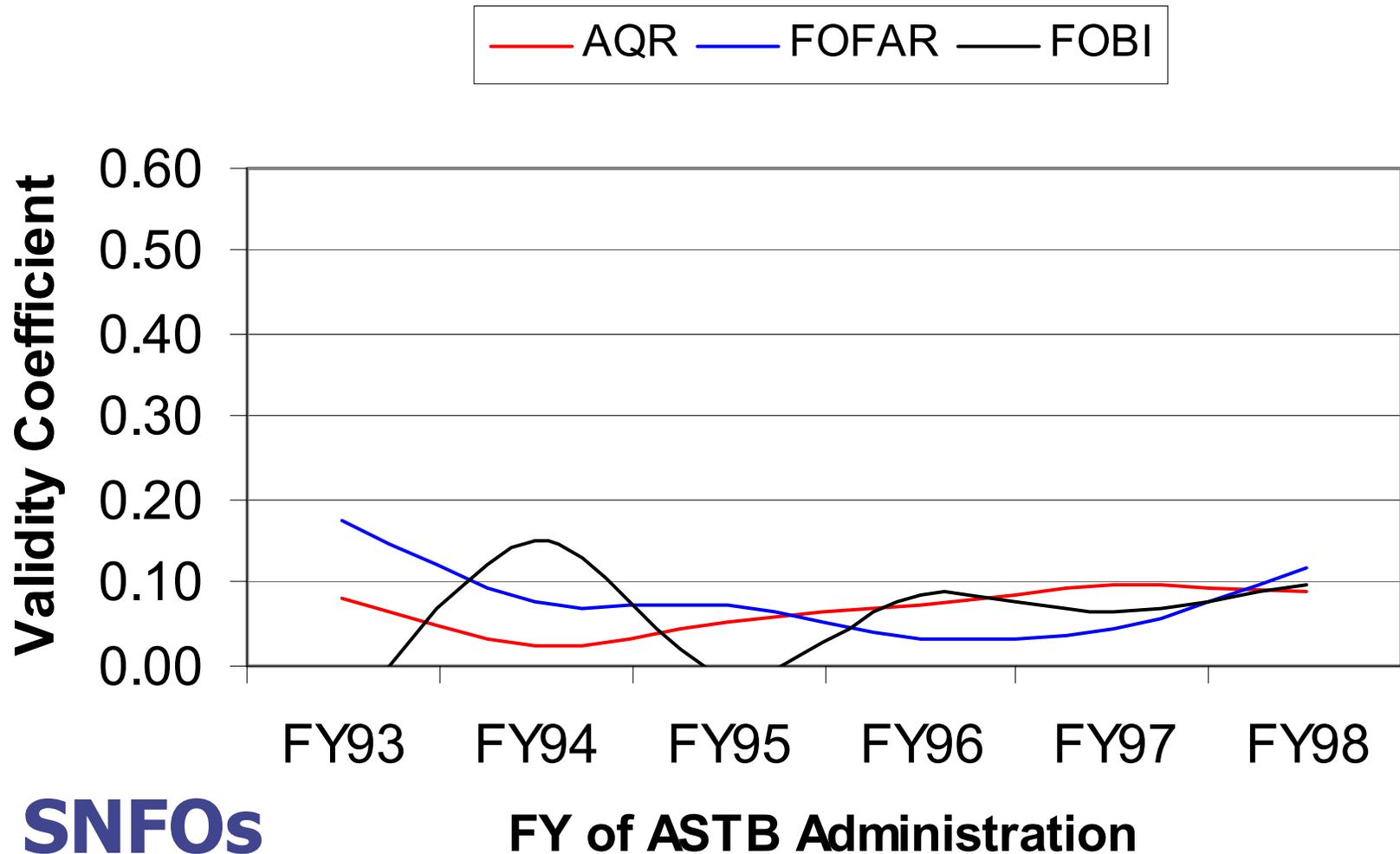
ASTB Component Validity by Test FY for Attrition Only



ASTB Component Validity by Test FY for DOR Status Only



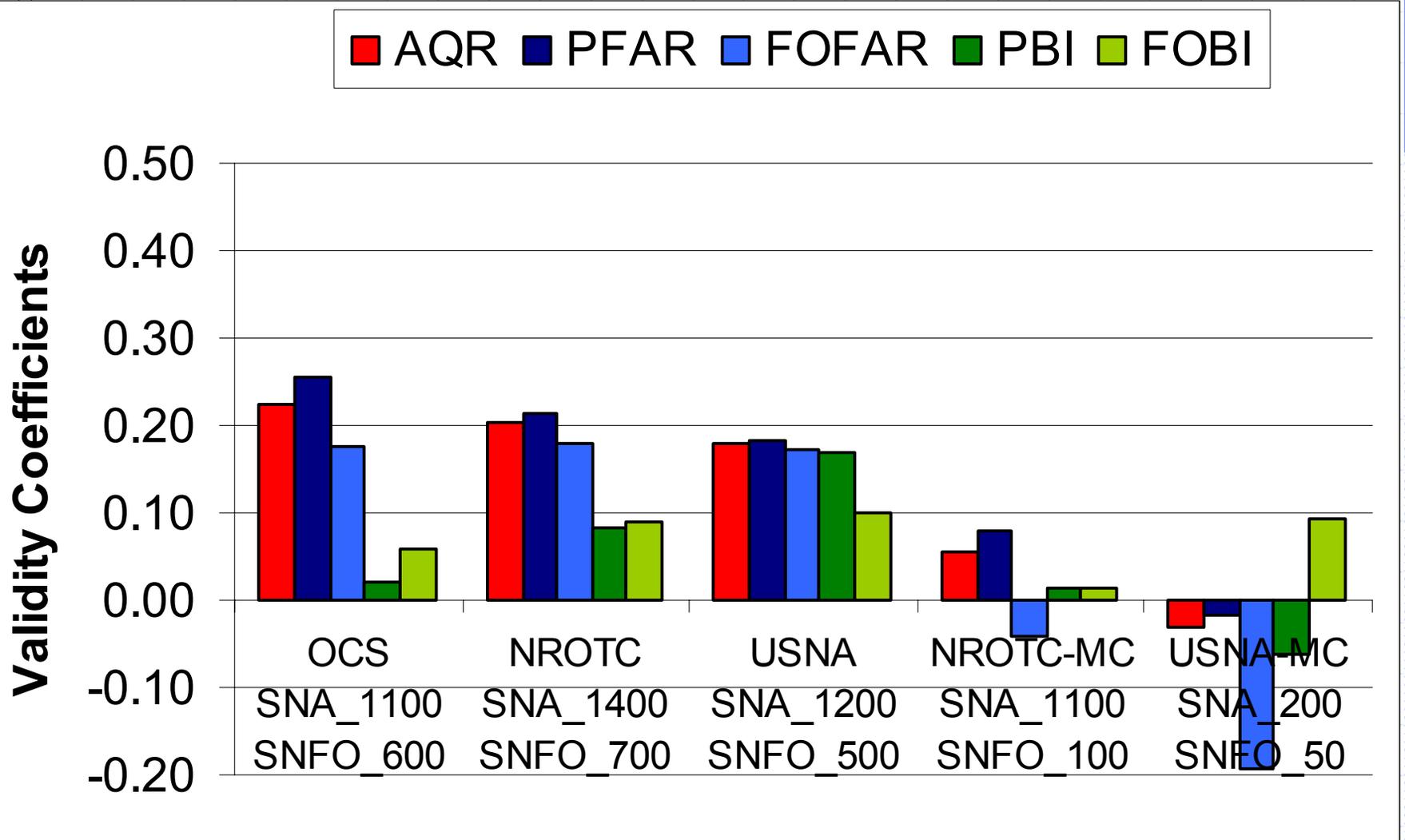
ASTB Component Validity by Test FY for DOR Status Only



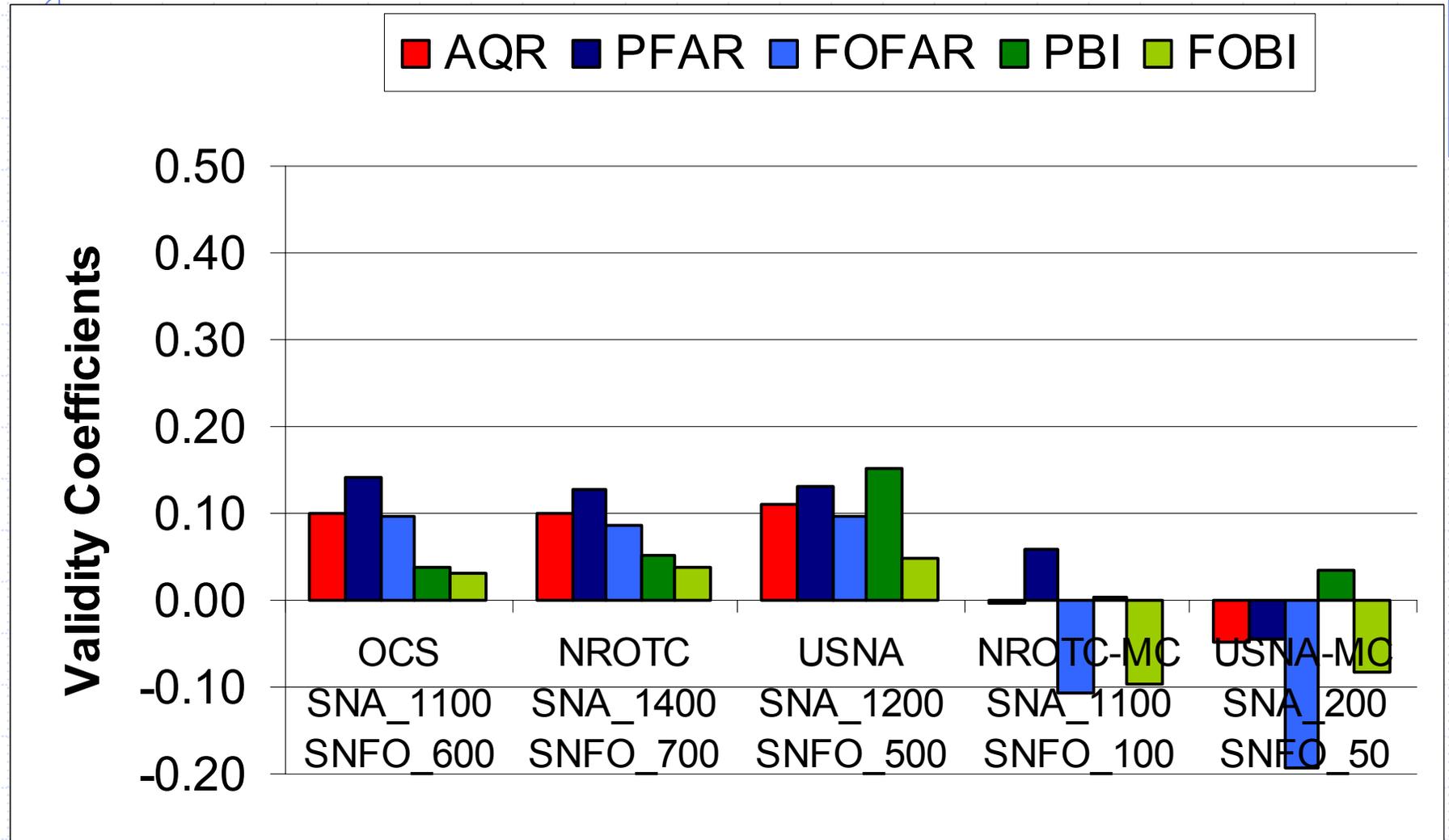
SNFOs

FY of ASTB Administration

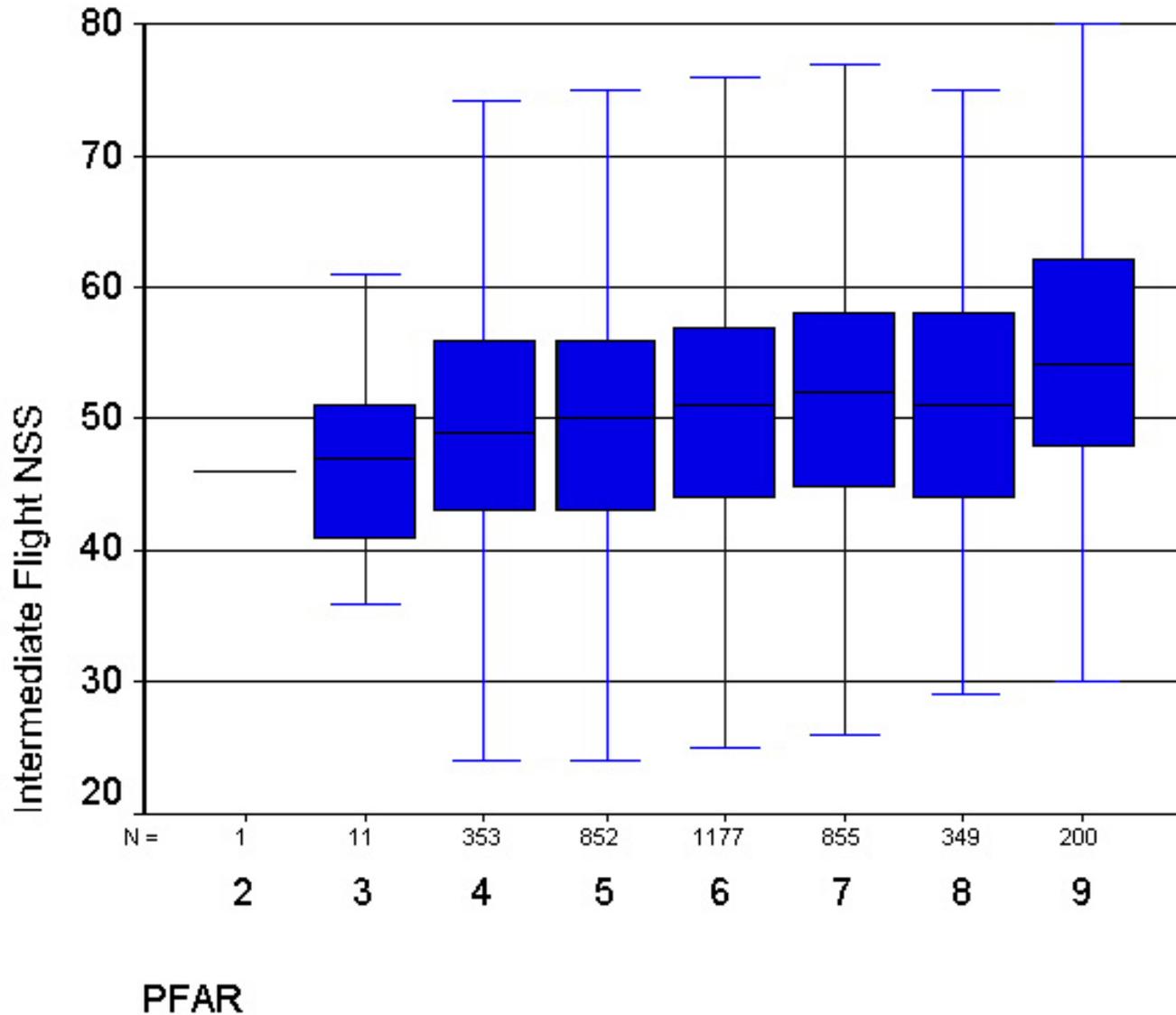
ASTB Component Validity by Source for Attrition Only



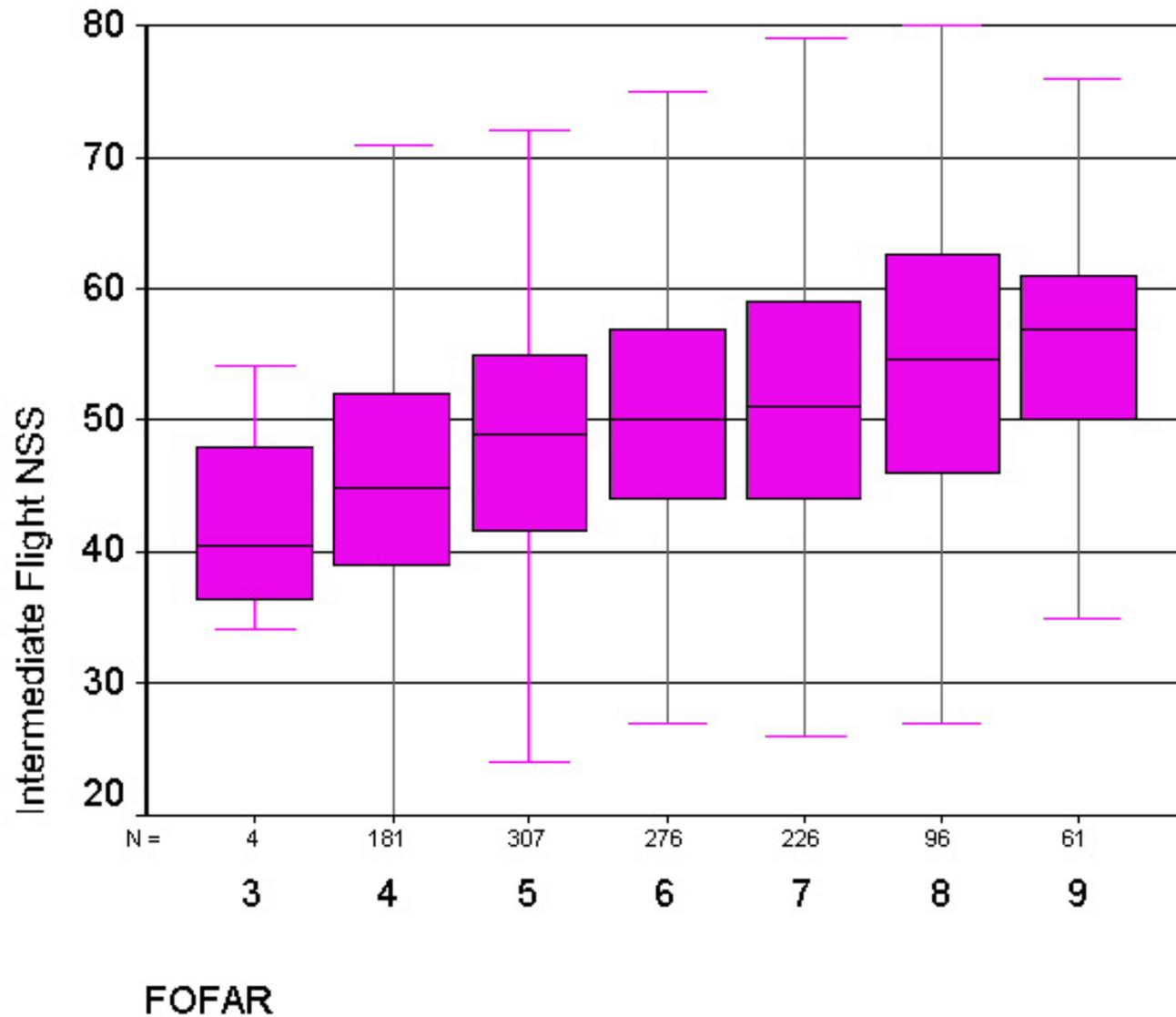
ASTB Component Validity by Source for DOR Status Only



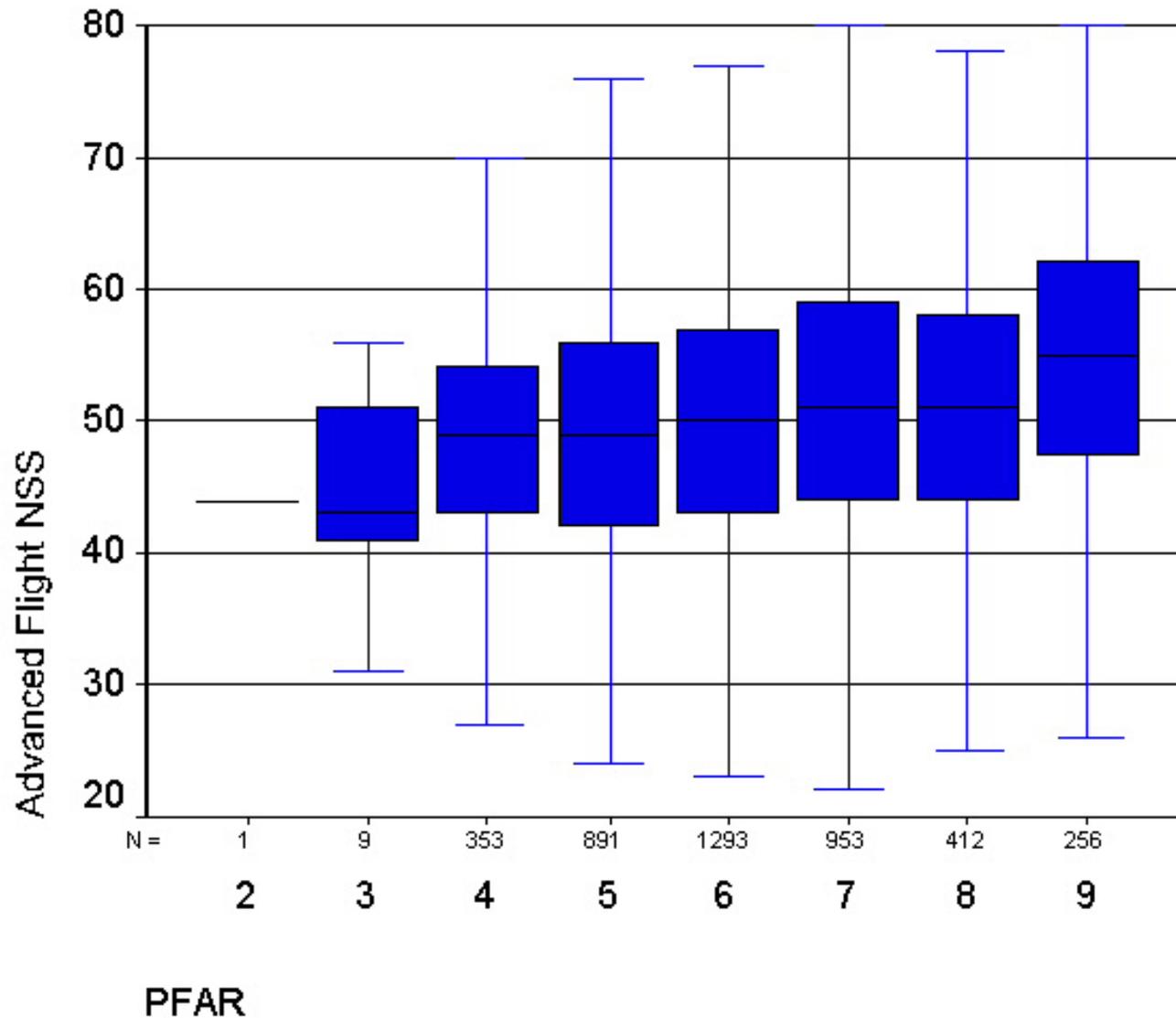
Intermediate NSS by PFAR



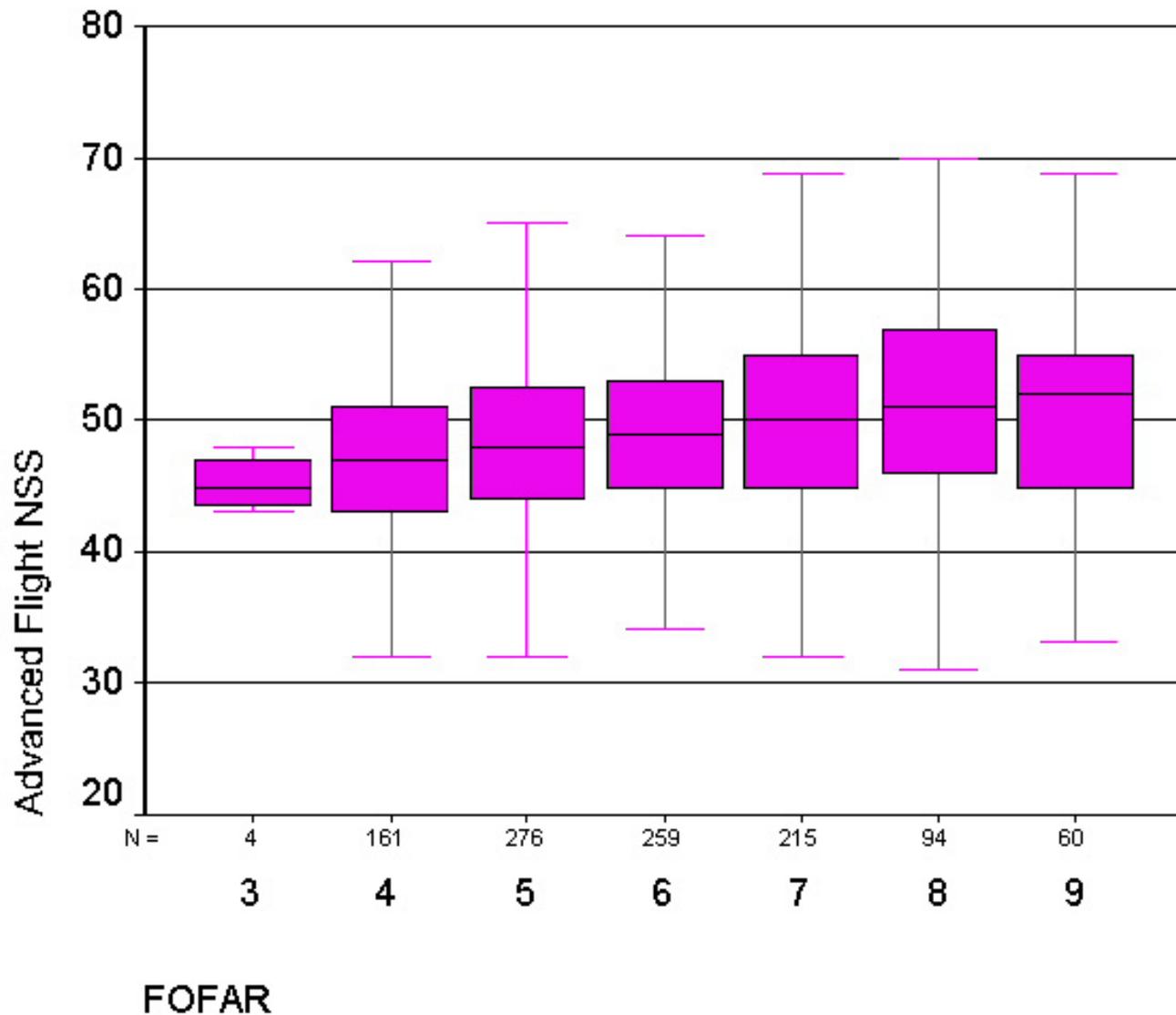
Intermediate NSS by FOFAR



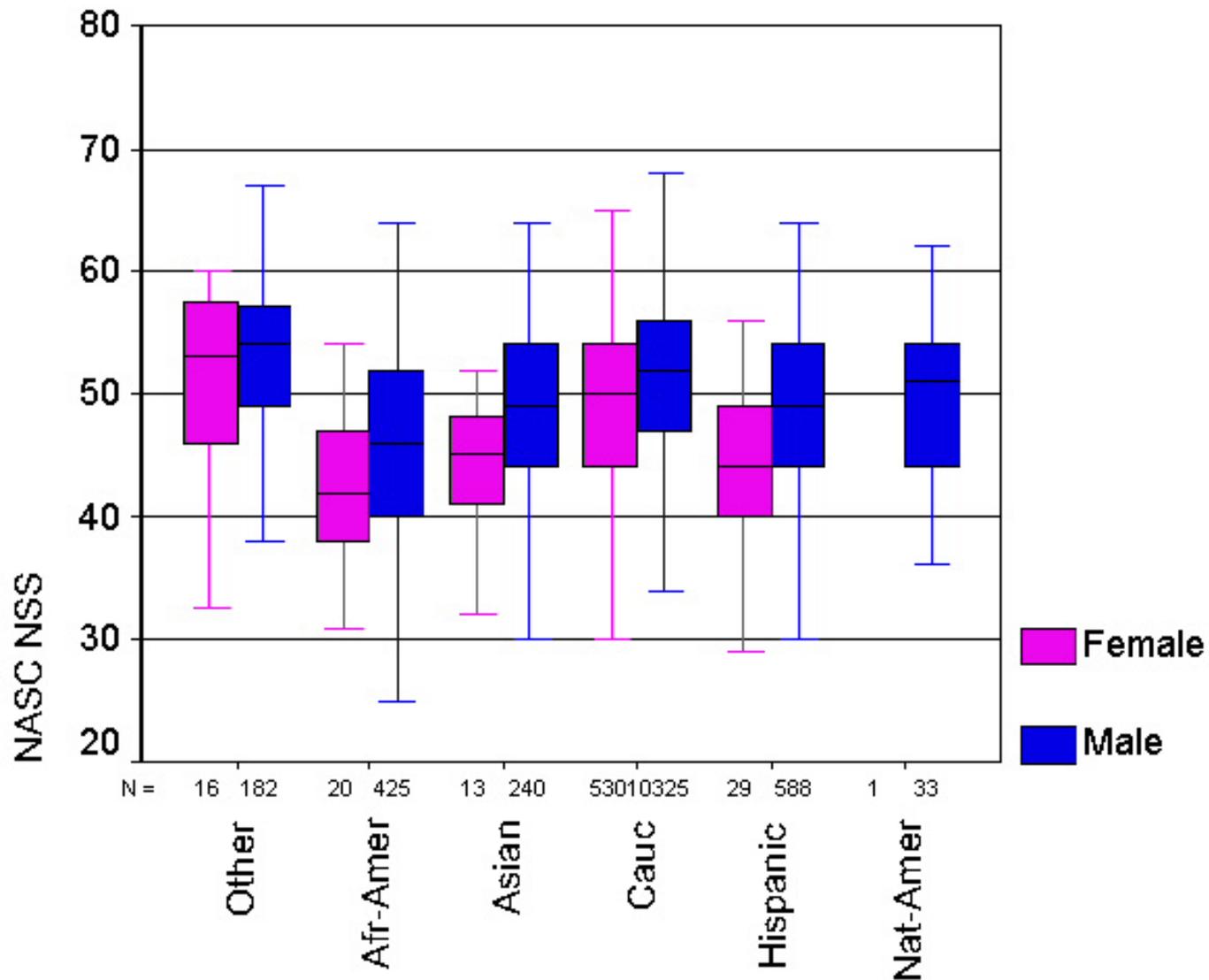
Advanced NSS by PFAR



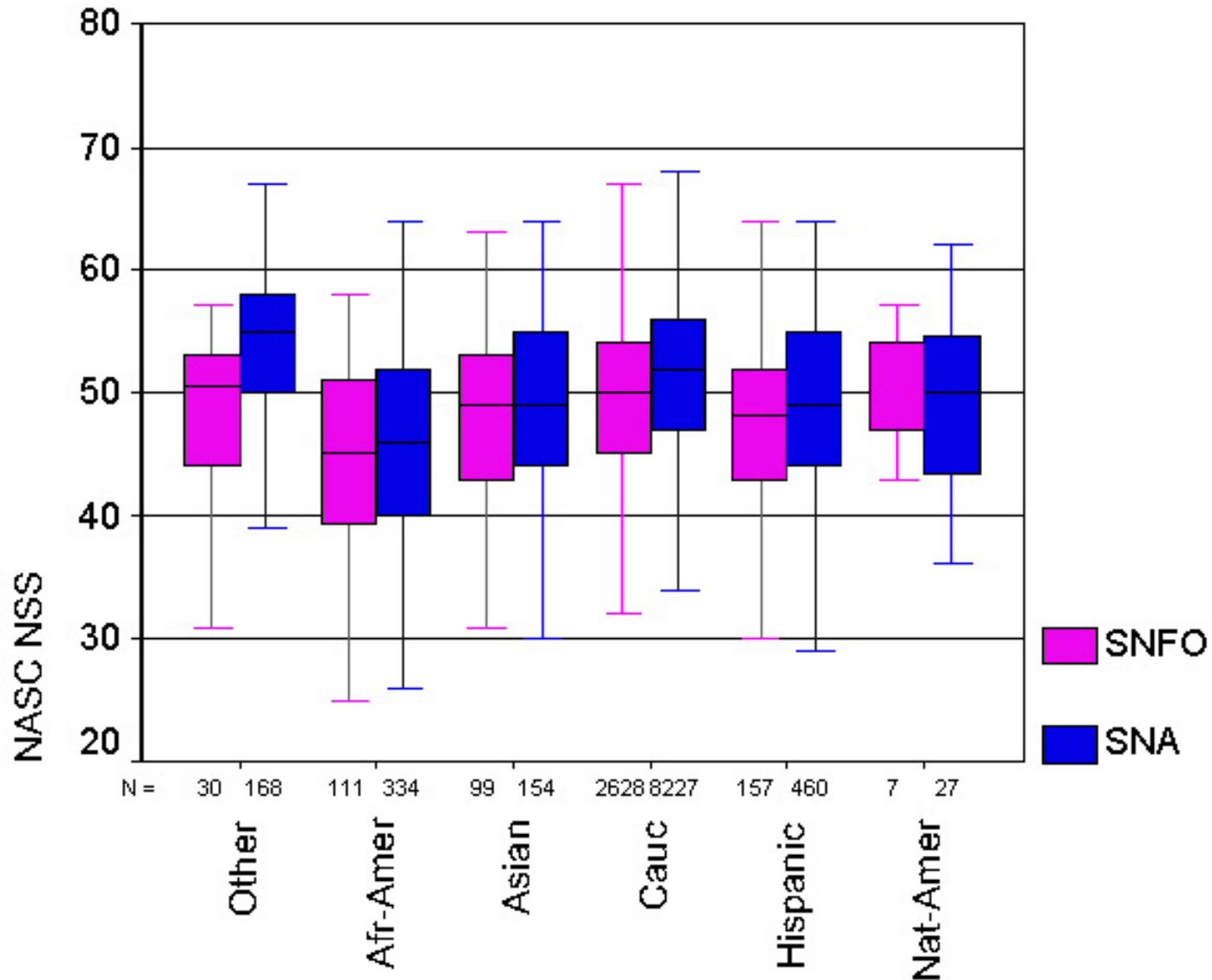
Advanced NSS by FOFAR



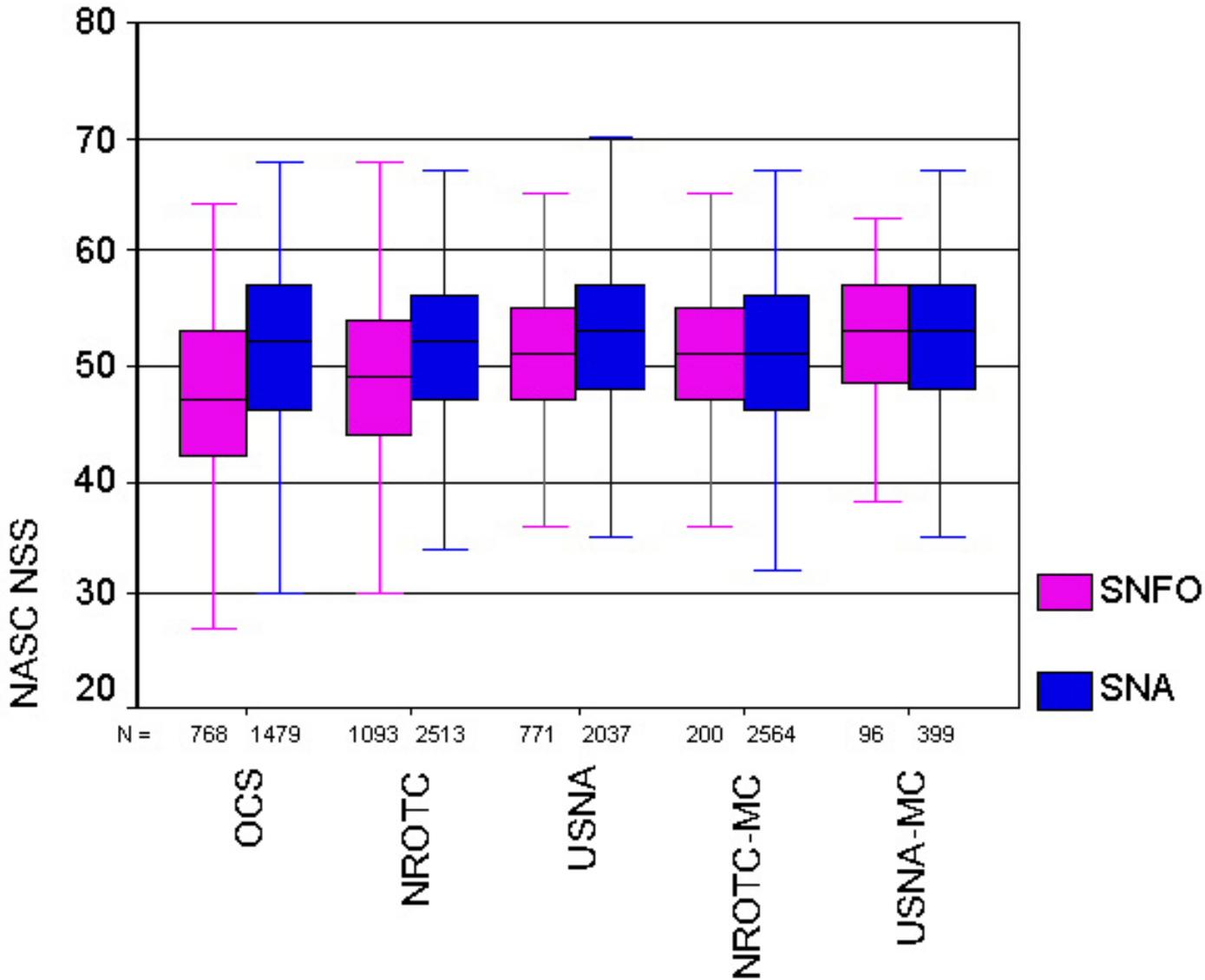
NASC NSS by Sex and Race



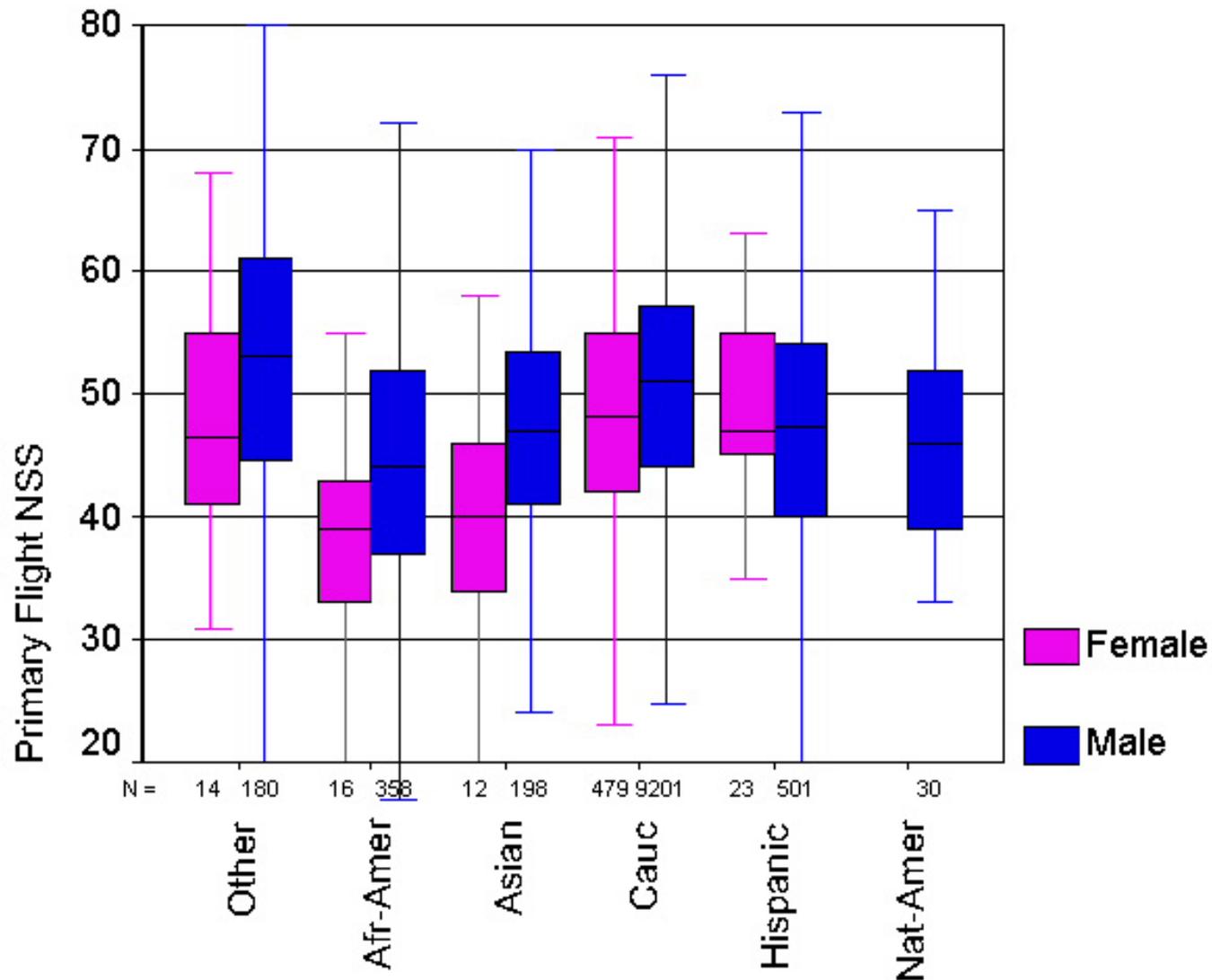
NASC NSS by Race and Program



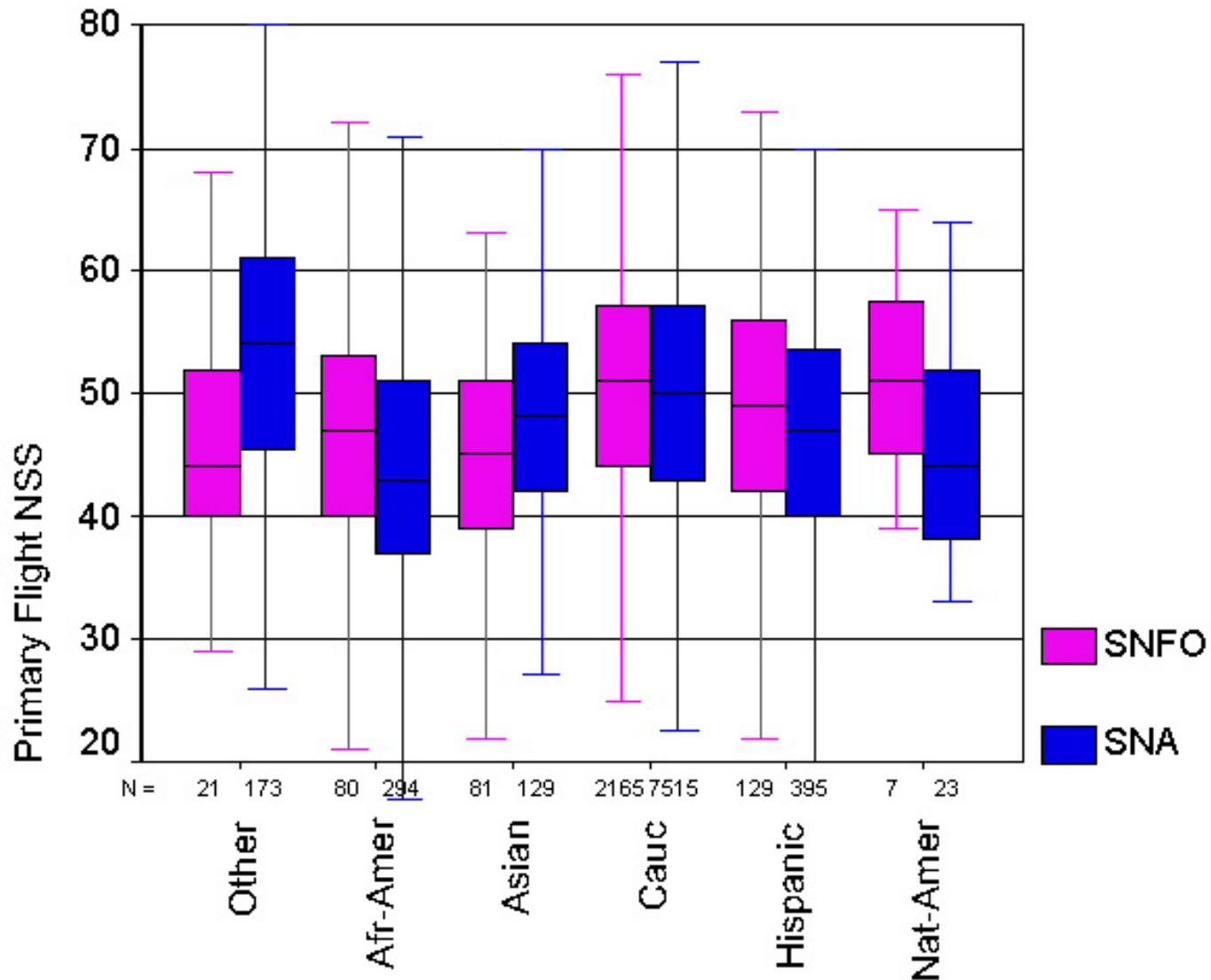
NASC NSS by Source and Program



Primary NSS by Sex and Race



Primary NSS by Race and Program



Primary NSS by Source and Program

