

Subjective Survival Expectations and Observed Survival: What Makes them Different?

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Why Study Subjective Expectations?

- Reflect beliefs that influence strategic behaviors
- Benchmark to assess behavioral or belief adjustments in response to the occurrence of significant events
- May reflect actual mortality
- Are intrinsically interest

What do we Know about Individuals' Subjective Survival Expectations?

- Hurd and McGarry (1995)
 - Aggregate to population probabilities
 - Covary with some variables in a similar manner than these variables covary with actual mortality outcomes
- Perozek (2008)
 - Subjective life expectancies are higher for men and lower for women than SSA life expectancies
 - Subjective life tables suggest a further narrowing of the gender gap longevity
- Post and Hanewald (2008)
 - Reflect awareness of stochastic mortality

Objectives

- To compare life tables estimated from subjective expectations with life tables from the Health and Retirement Study (HRS) and those from vital statistics
- To study mortality differentials by BMI and smoking using subjective and objective expectations
- To study the effects of health shocks on subjective expectations

Data – Health and Retirement Study

- Individuals aged 50-61 in 1992

- Waves 1992 - 2006

- 1992 Sample composition

Whites: Males N = 3345 Females N = 3834

Blacks: Males N = 623 Females N = 630

Data – Health and Retirement Study

- Individuals aged 50-61
- Waves 1992 - 2006
- 1992 Sample composition

Whites: Males N = 3345 Females N = 3834

Blacks: Males N = 623 Females N = 630

- 2004 Sample composition

Whites: Males N = 1213 Females N = 1594

Blacks: Males N = 150 Females N = 218

Health and Retirement Study – Subjective Survival Question (1992)

“Using any number from 0 to 10, where 0 equals absolutely no chance and 10 equals absolutely certain,

What do you think are the chances that you will live to be 75 or more?”

To be 85 or more?”

Health and Retirement Study – Subjective Survival Question (2000 on)

“Using any number from 0 to 100, where 0 equals absolutely no chance and 100 equals absolutely certain,

What do you think are the chances that you will live to be 75 or more?” (younger than 66)

To be 80 or more?” (aged 65-69)

To be 85 or more?” (aged 70-74)

To be 90 or more?” (aged 75-79)

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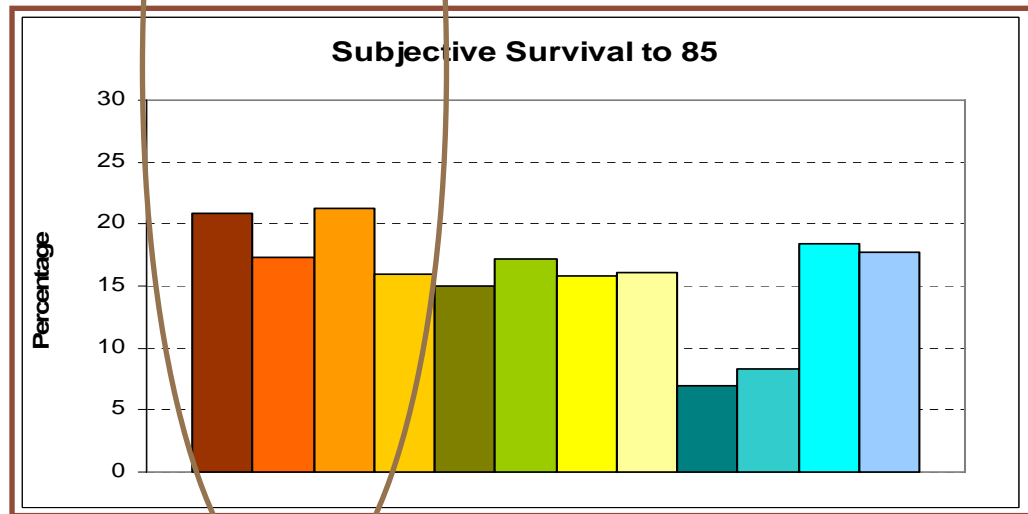
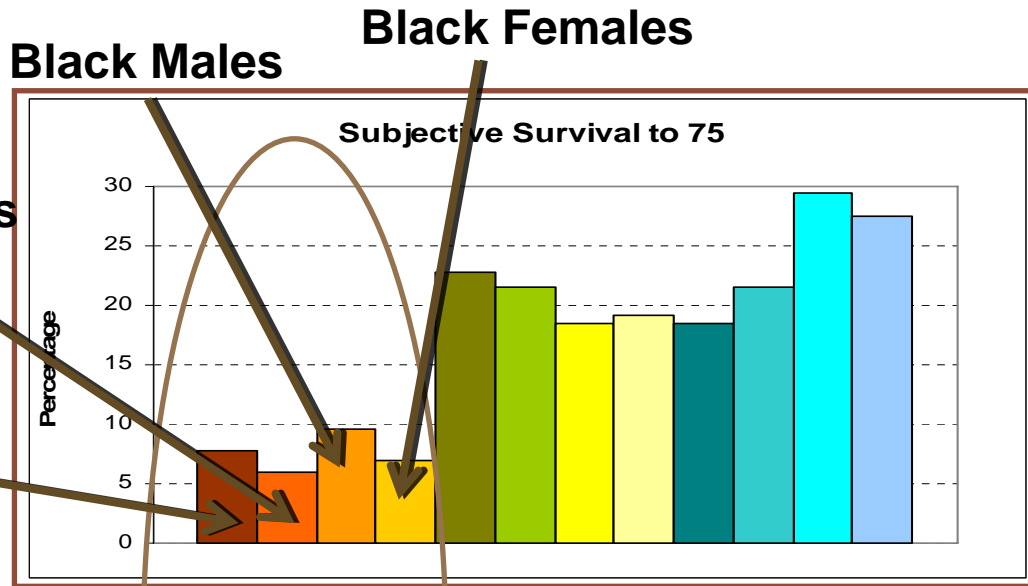
Methods

- Retrieve mortality information up to 2006 of individuals aged 50-61 in 1992
- Retrieve expected survival information from questions on subjective survival to ages 75 and 85 (or 80 depending on the particular HRS wave)
- Assume that individuals use same age pattern of mortality to assess expectations but differ in terms of the levels of mortality they are expressing:
- Non Linear Squares methods to estimate observed and subjective life tables fitting a range of mortality functions: Gompertz, Weibull, logistic and log logistic

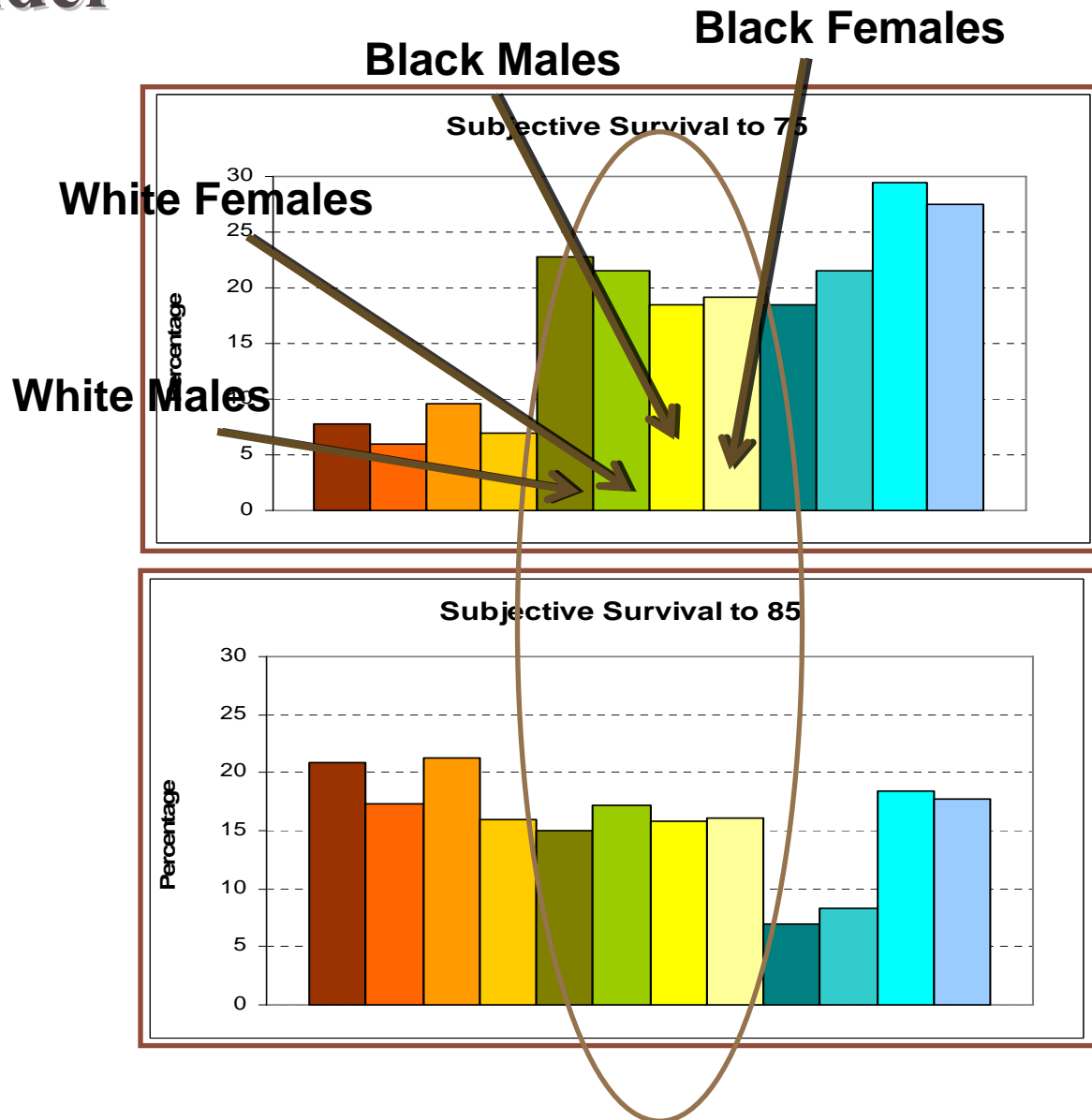
Subjective Survival Questions: Focal Point Answers: “0”, “0.5” and “1”

- Coarseness of the Scale
- Greater Uncertainty
- Rounding Mechanisms
- Cognition Problems

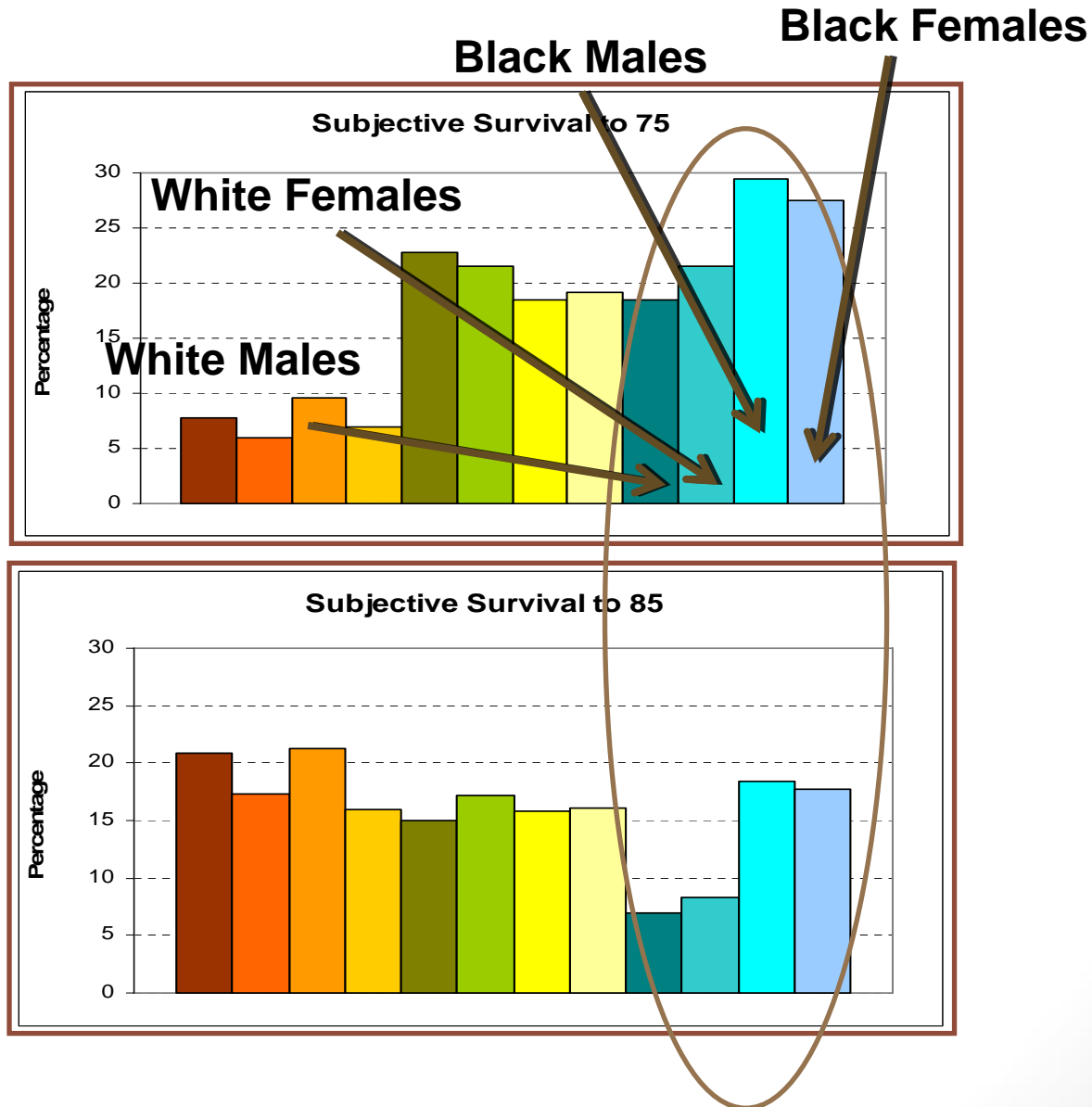
Percentage Focal Answers "0" by Race and Gender



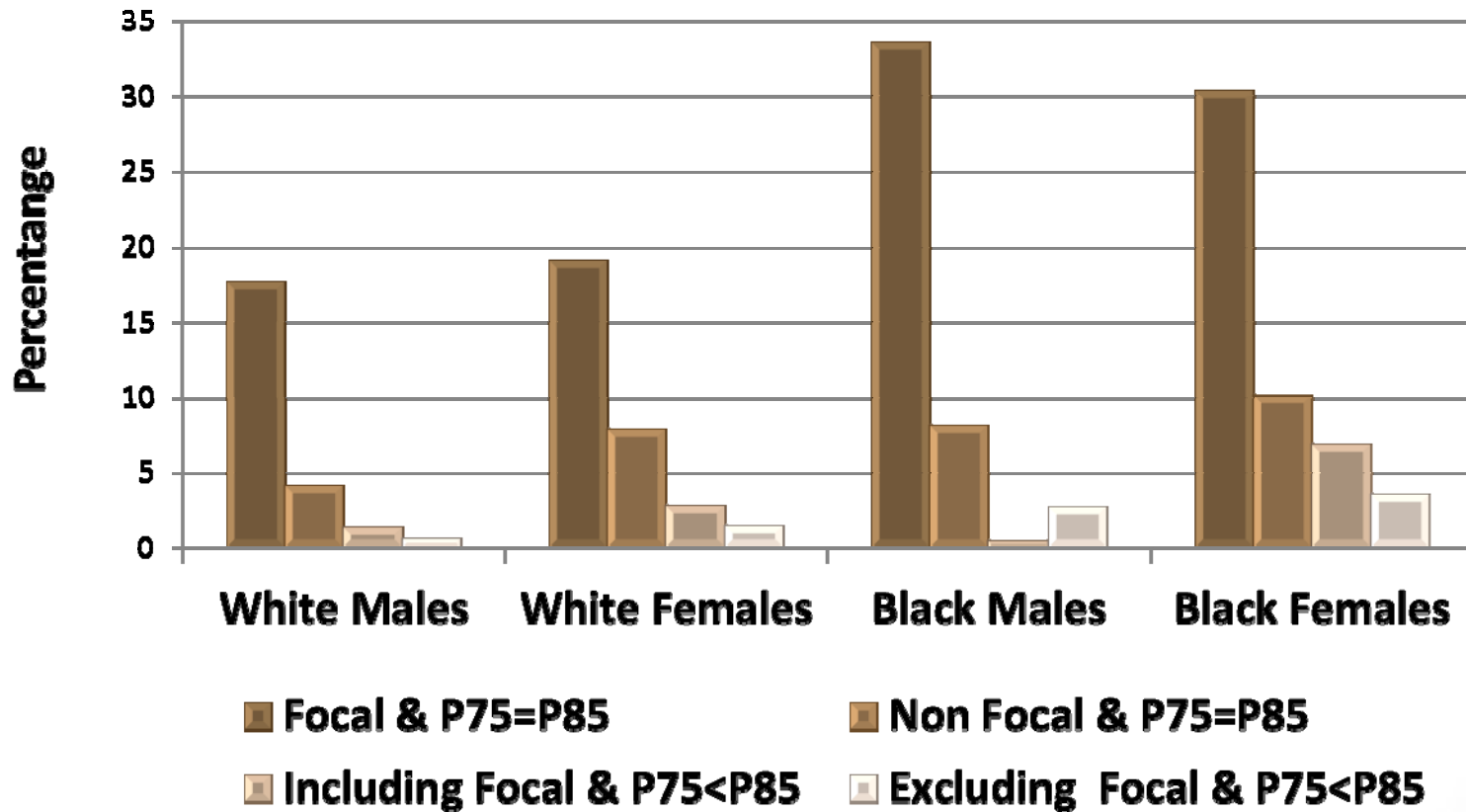
Percentage Focal Answers "0.5" by Race and Gender



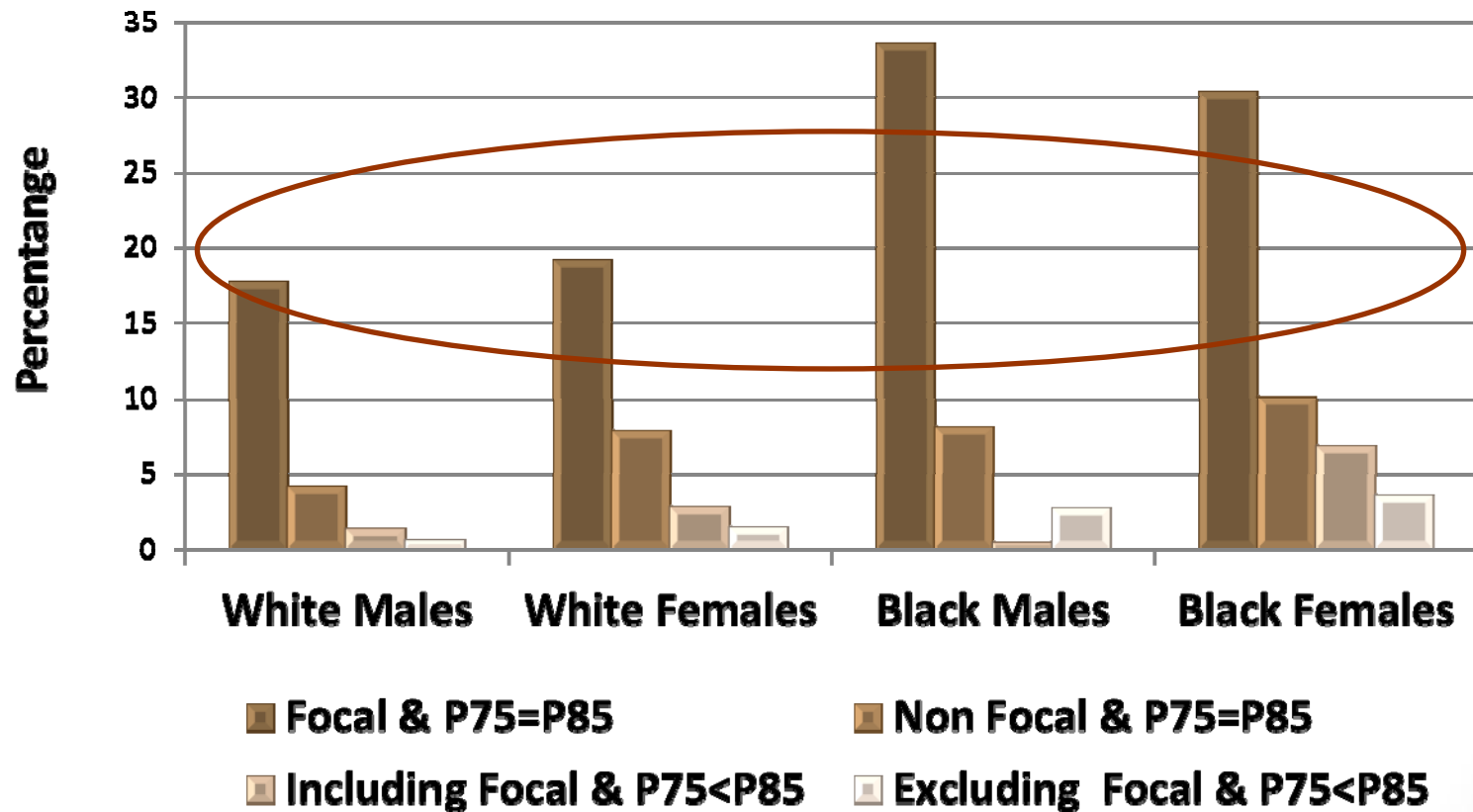
Percentage Focal Answers “1” by Race and Gender



Percentage of Inconsistent Answers (P75≤P85) by Race and Gender

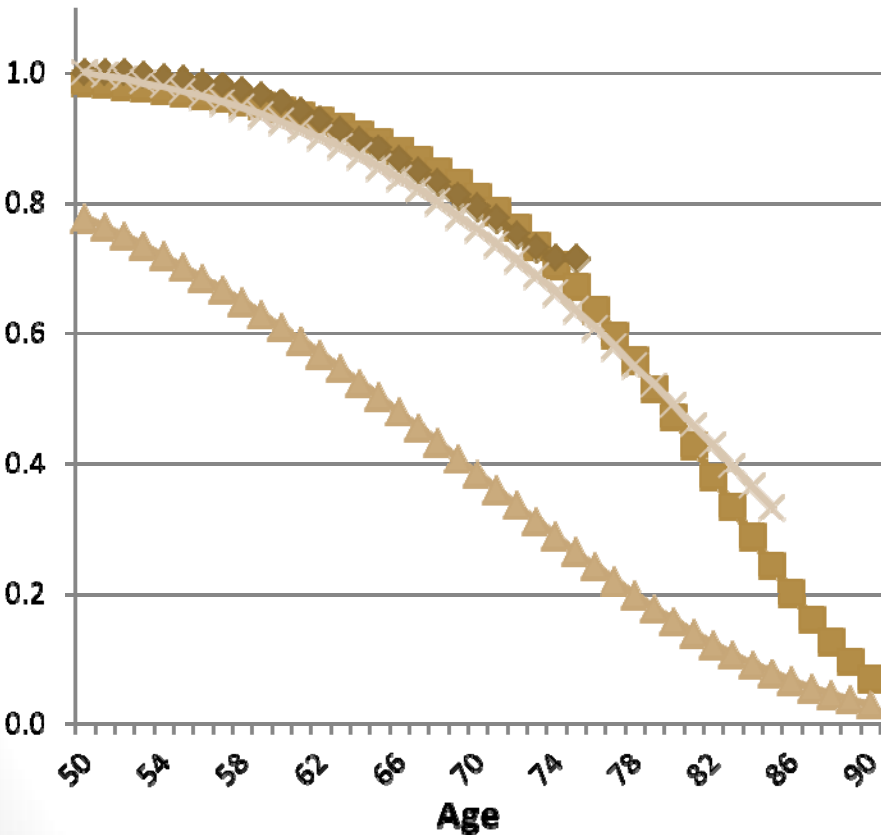


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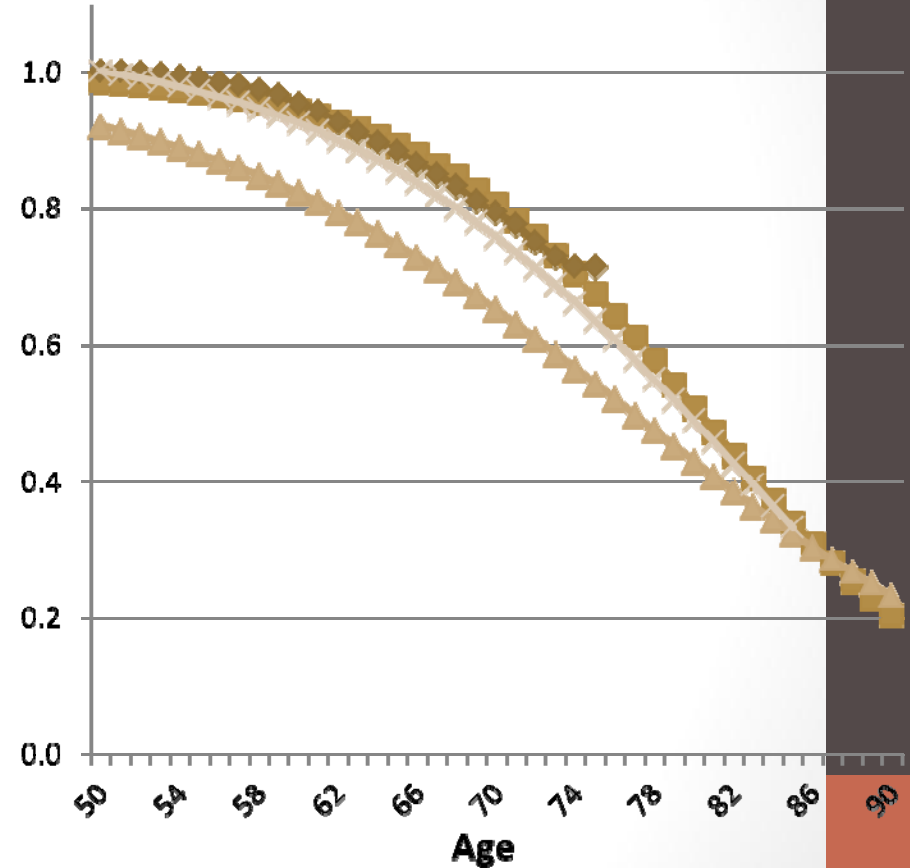
HRS 1992-2006 Survival Function - Gompertz and Logistic – All 1992 Answers – White Males

Gompertz



- Gompertz Observed
- ▲ Gompertz Subjective Age 75 & 85
- ◆ HRS Life Table
- × US Life Table 1992 White Males

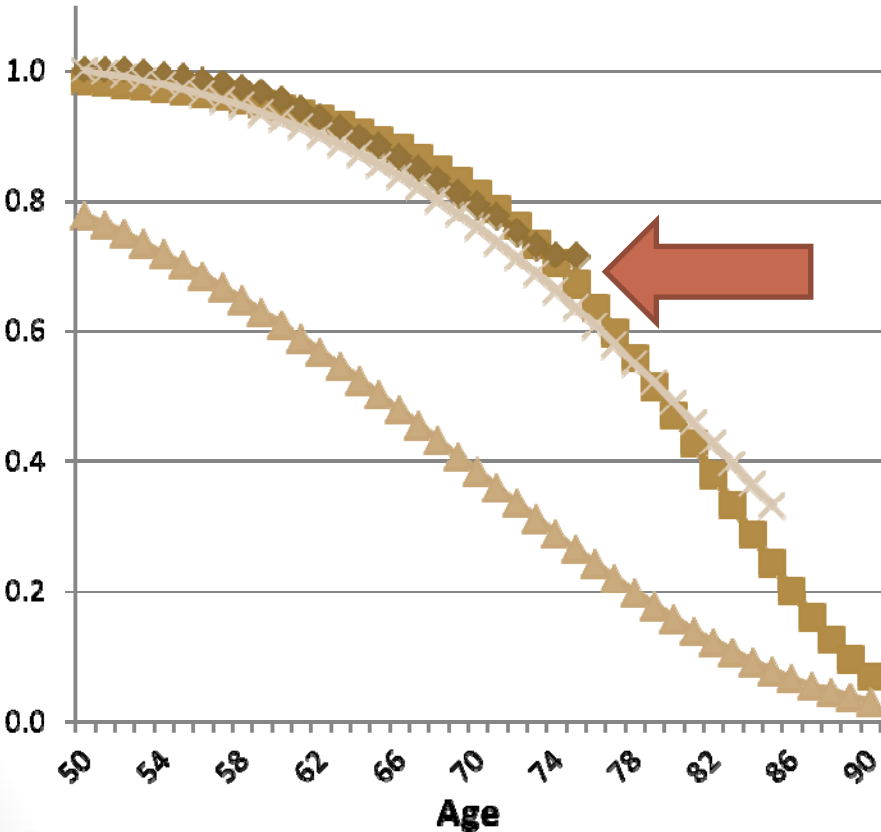
Logistic



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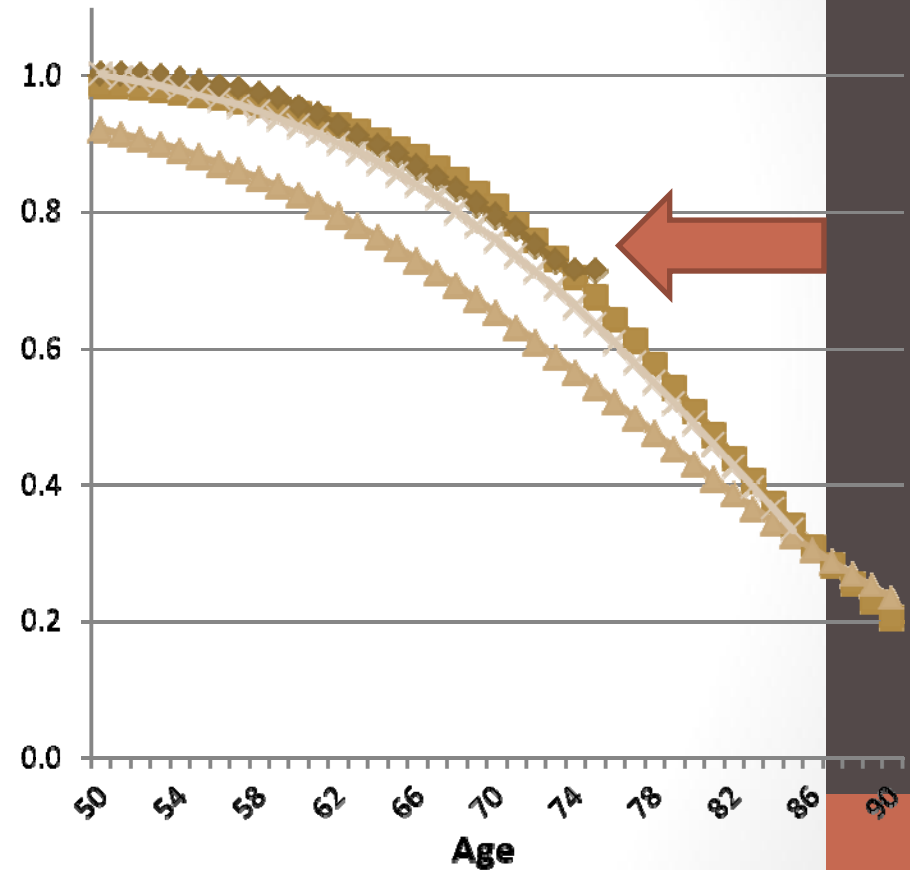
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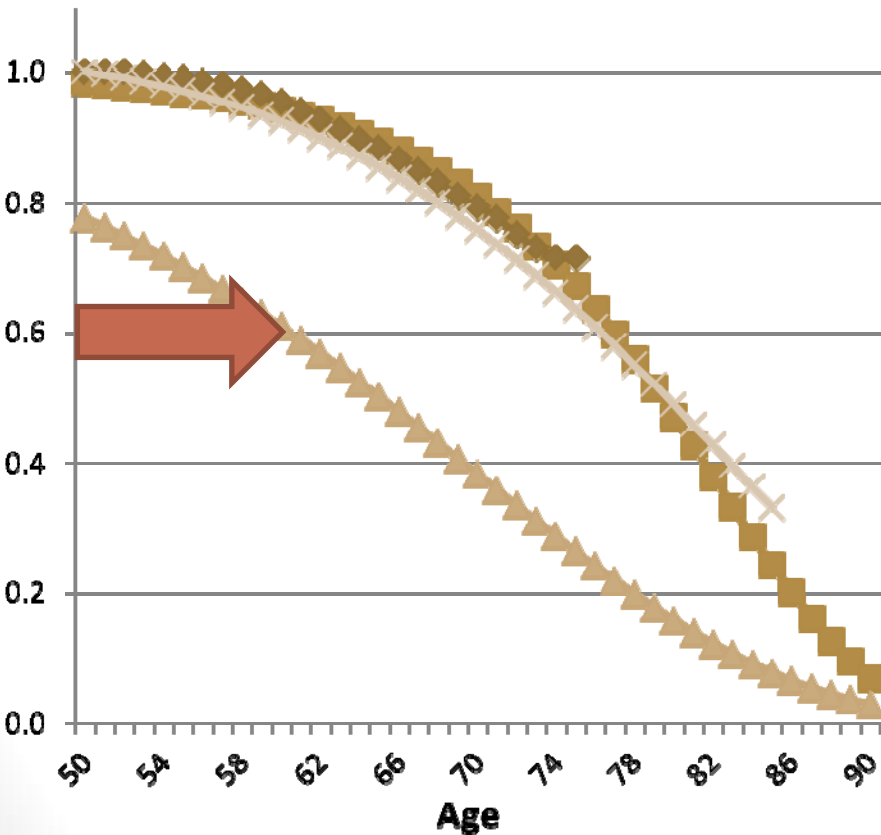
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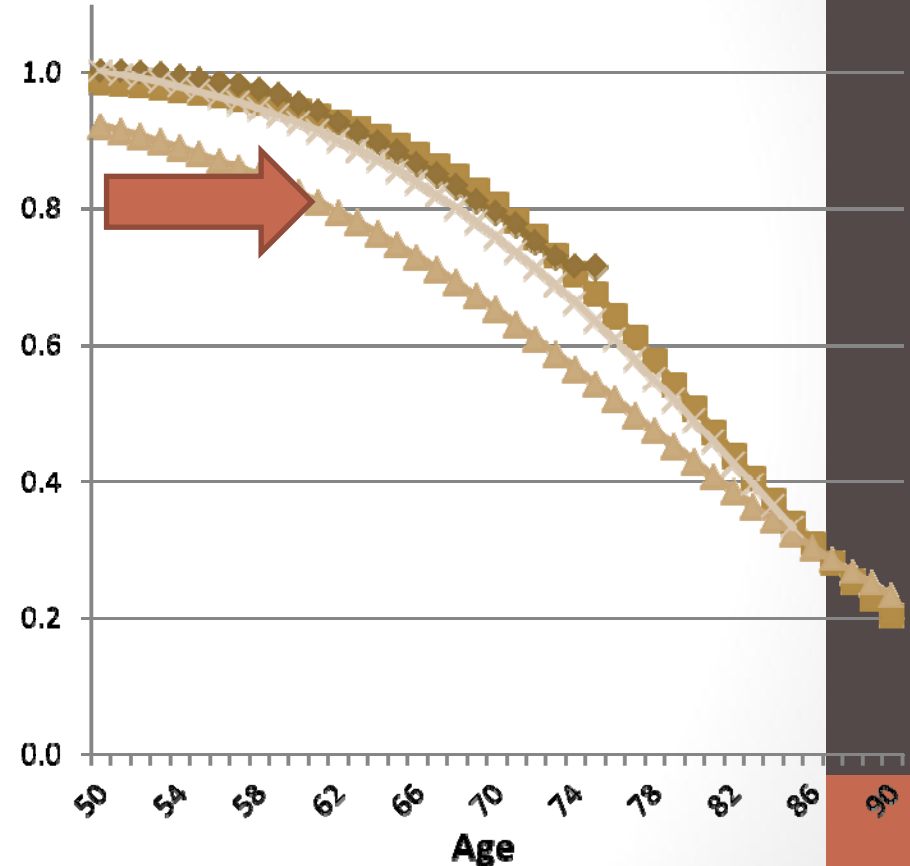
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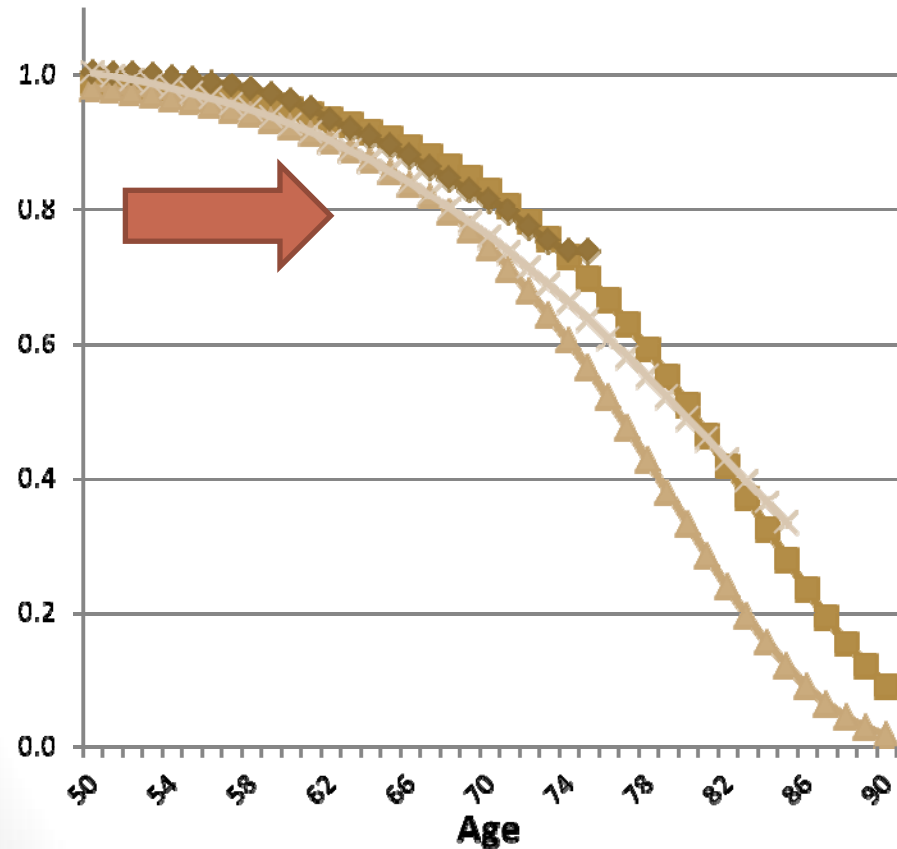
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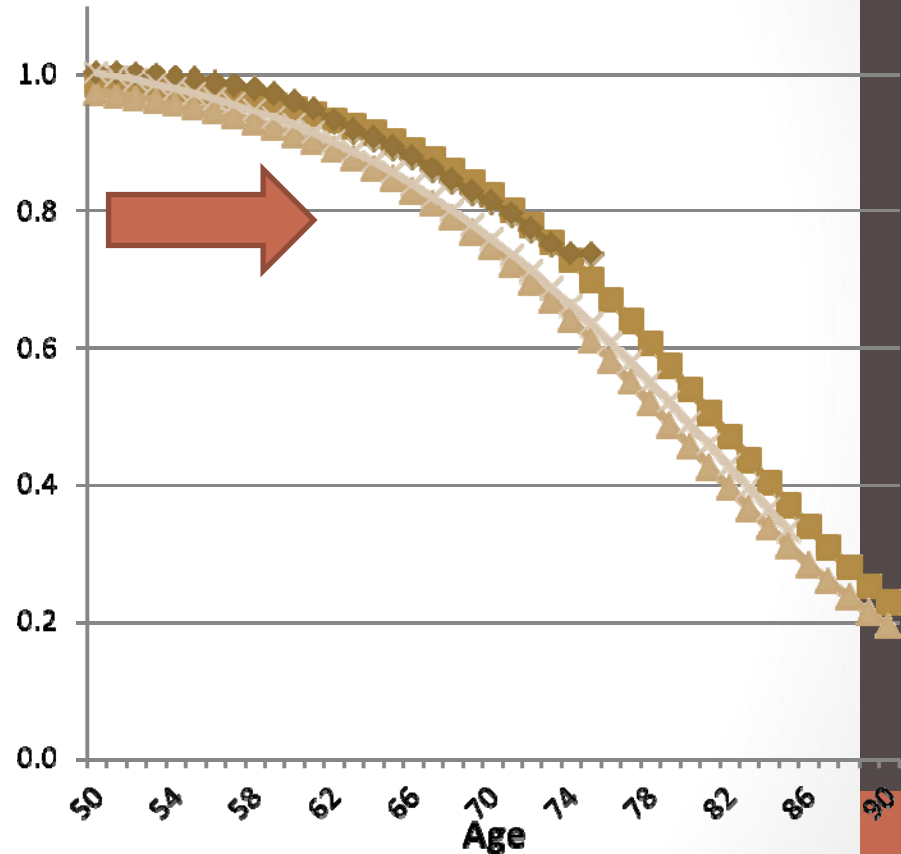
Effect of Excluding Inconsistent Answers on the Estimation of Parameters of Mortality Functions

Gompertz



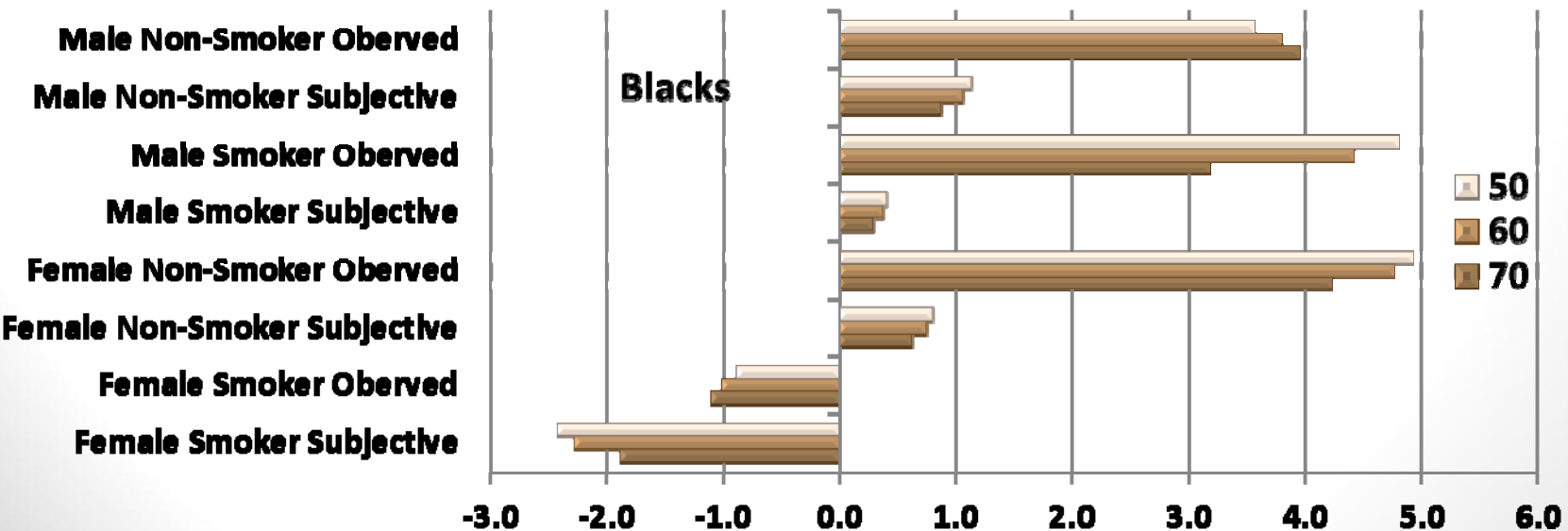
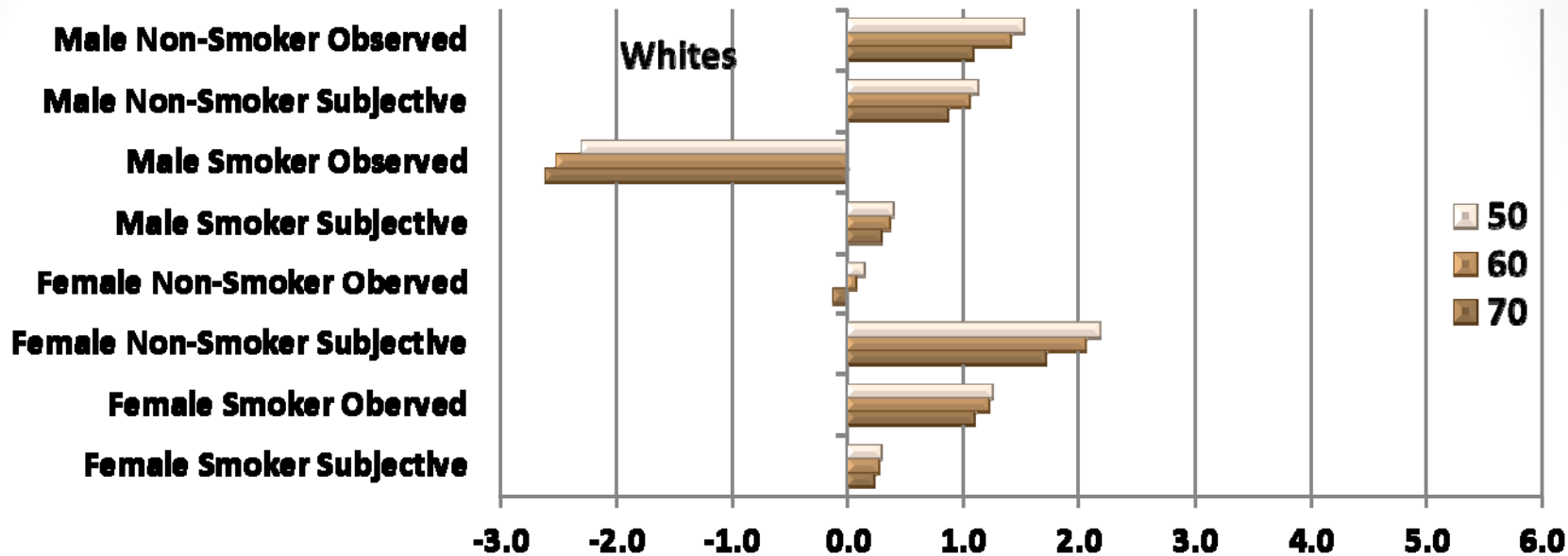
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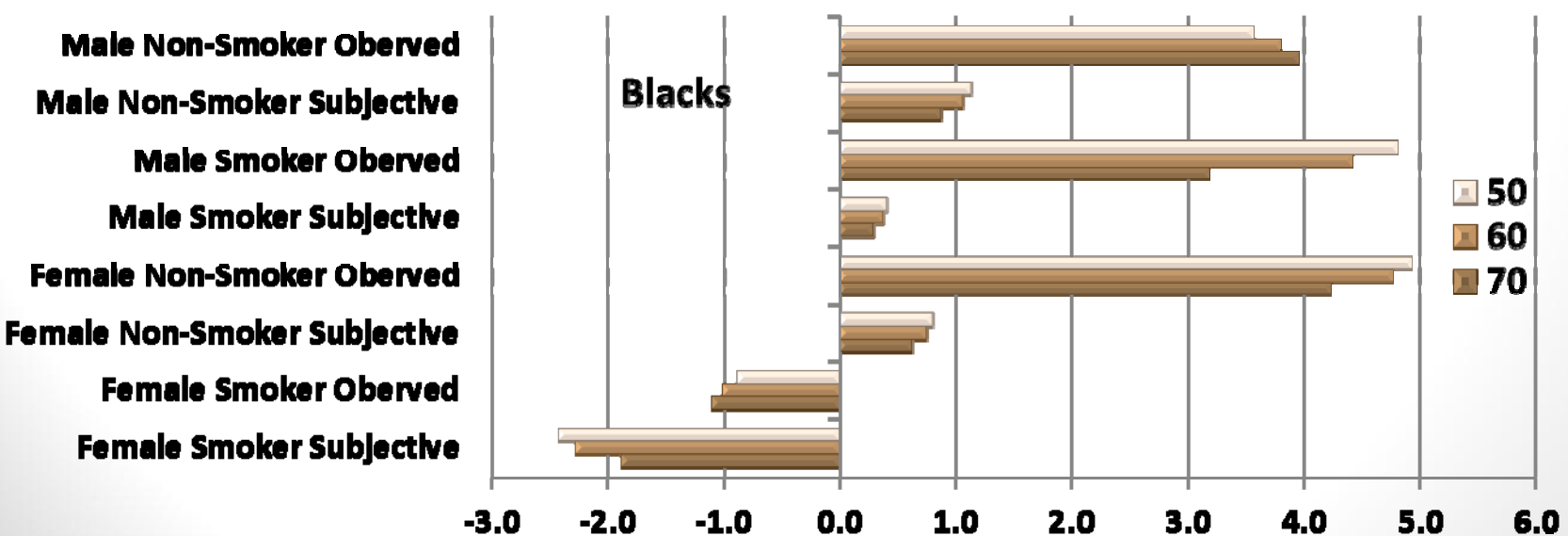
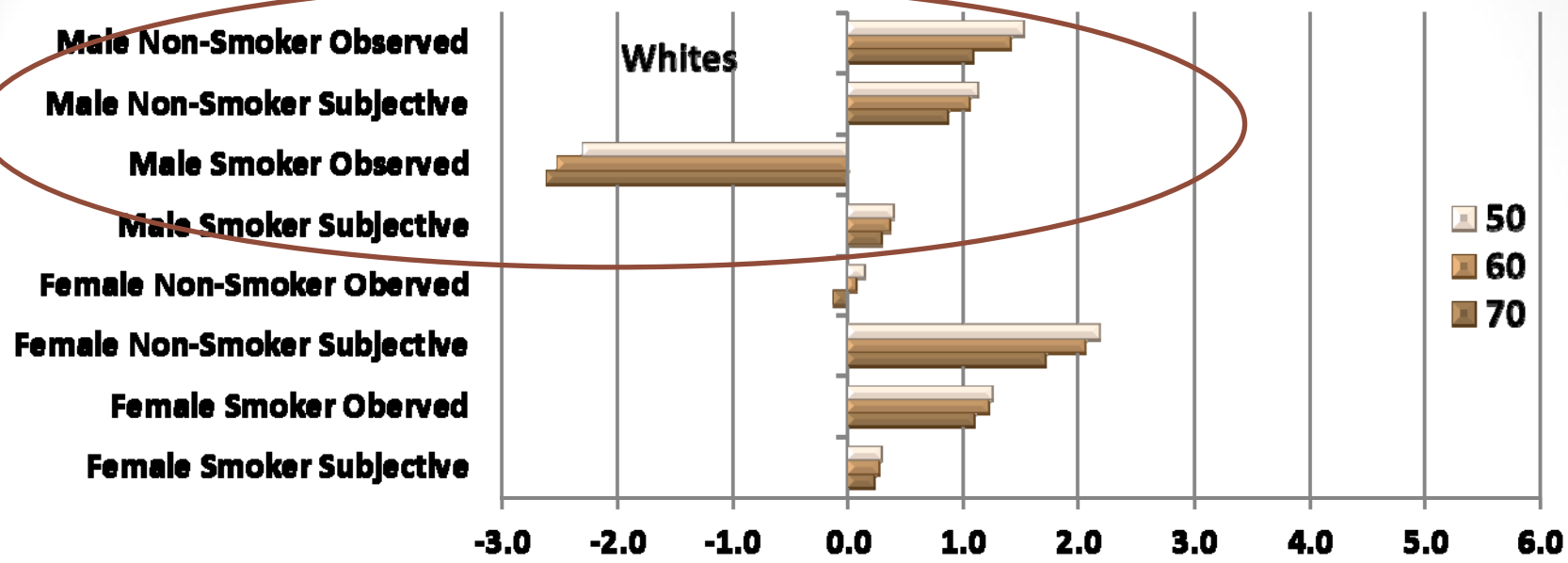


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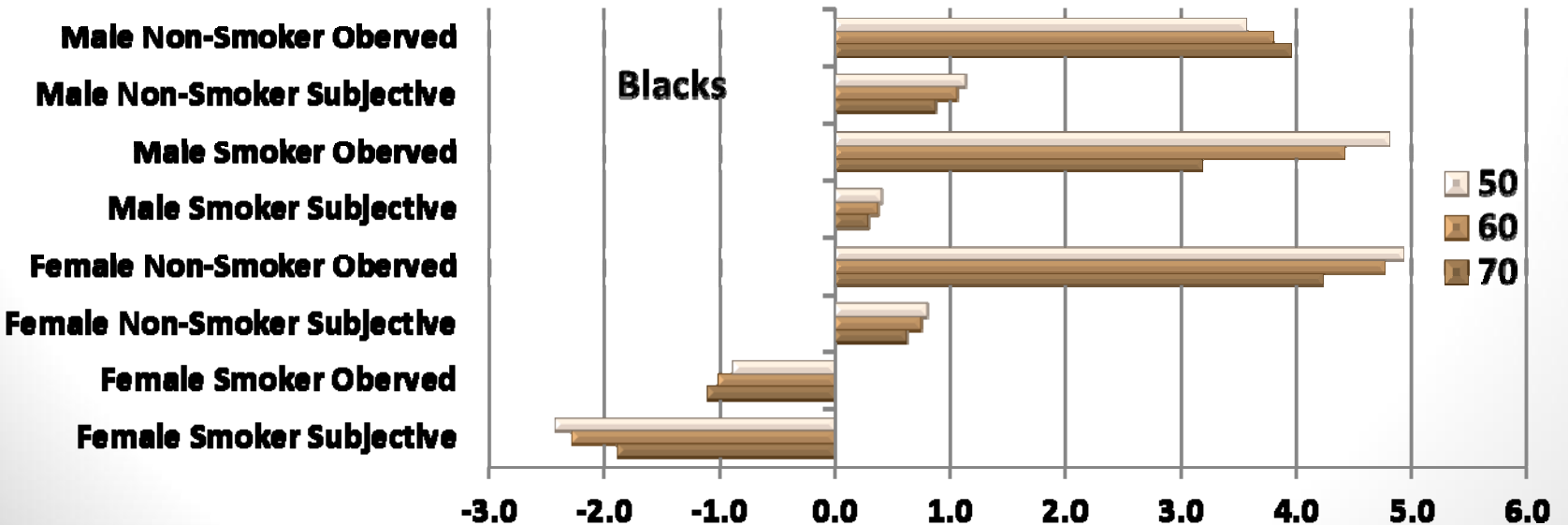
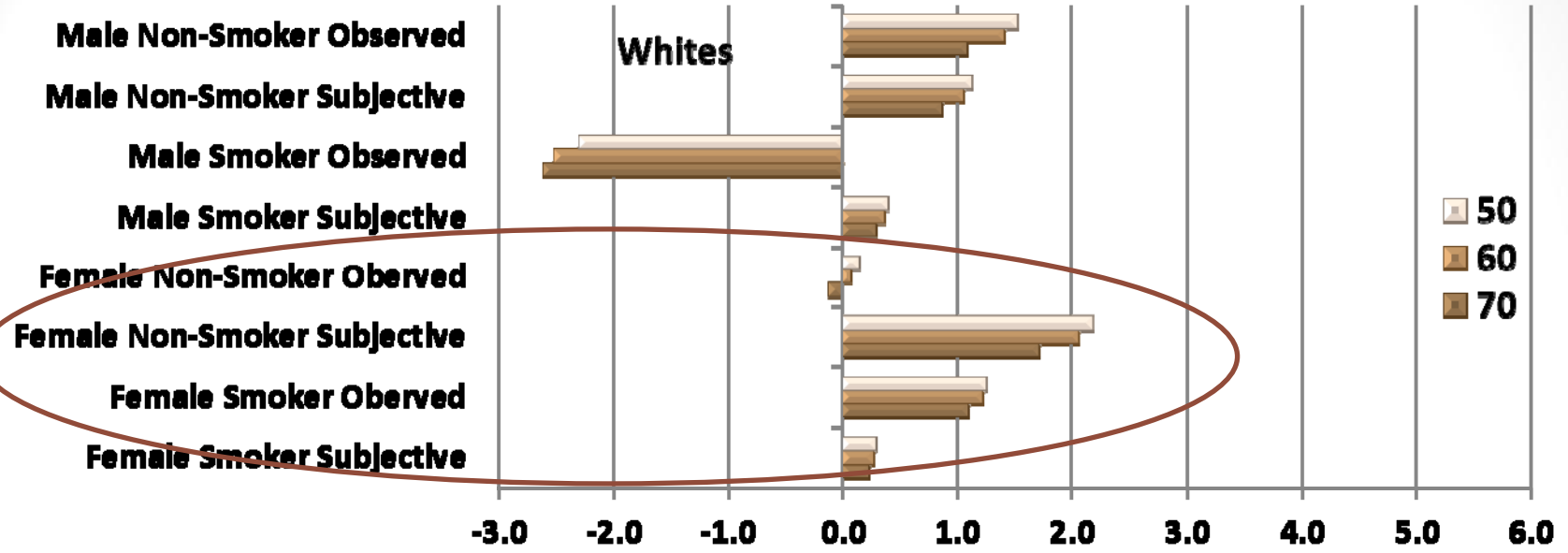
Difference in Life Expectancy between Normal/Overweight and Obese Individuals



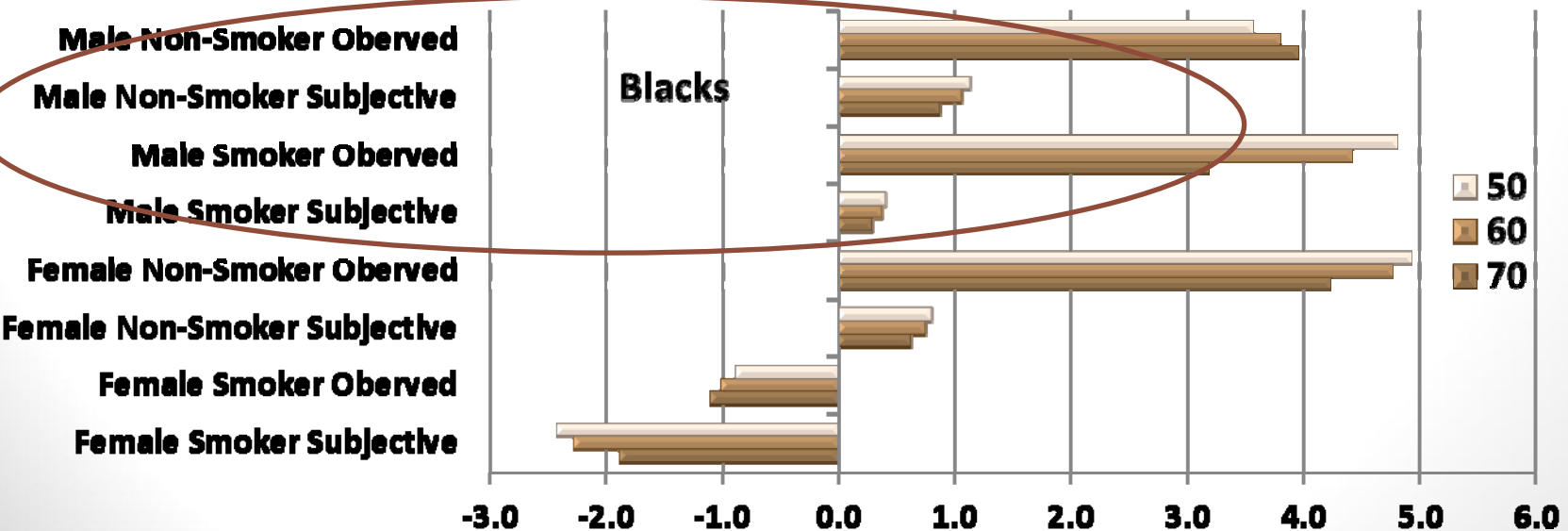
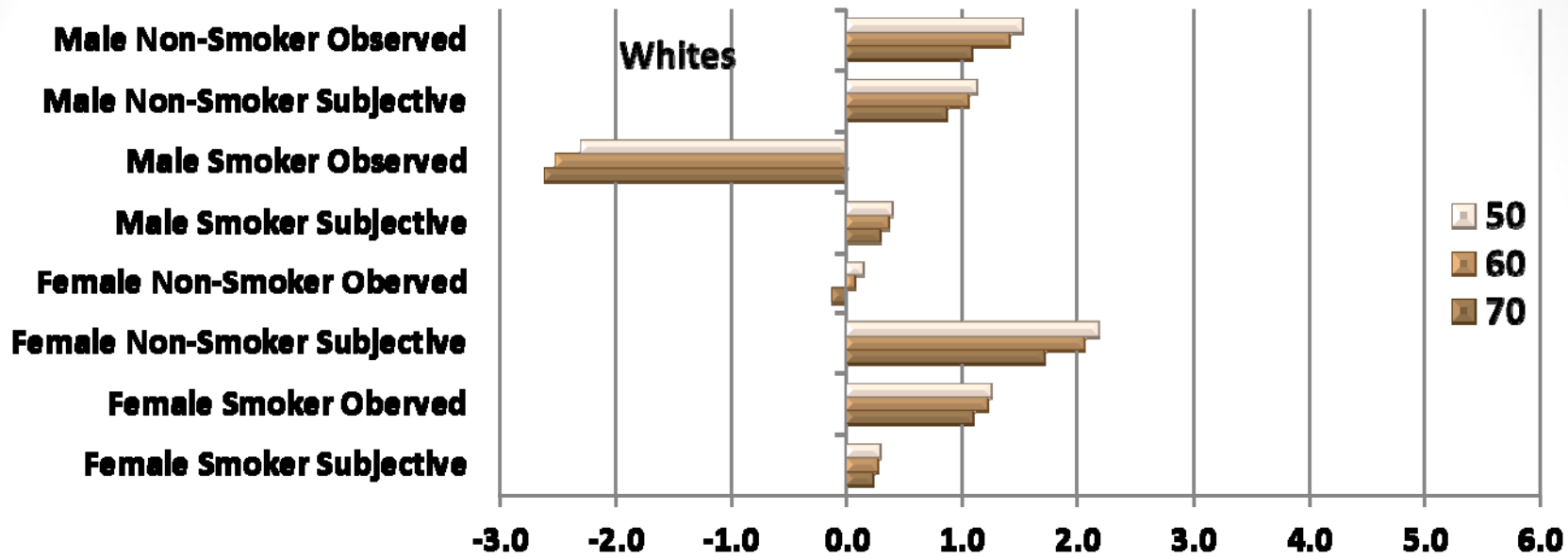
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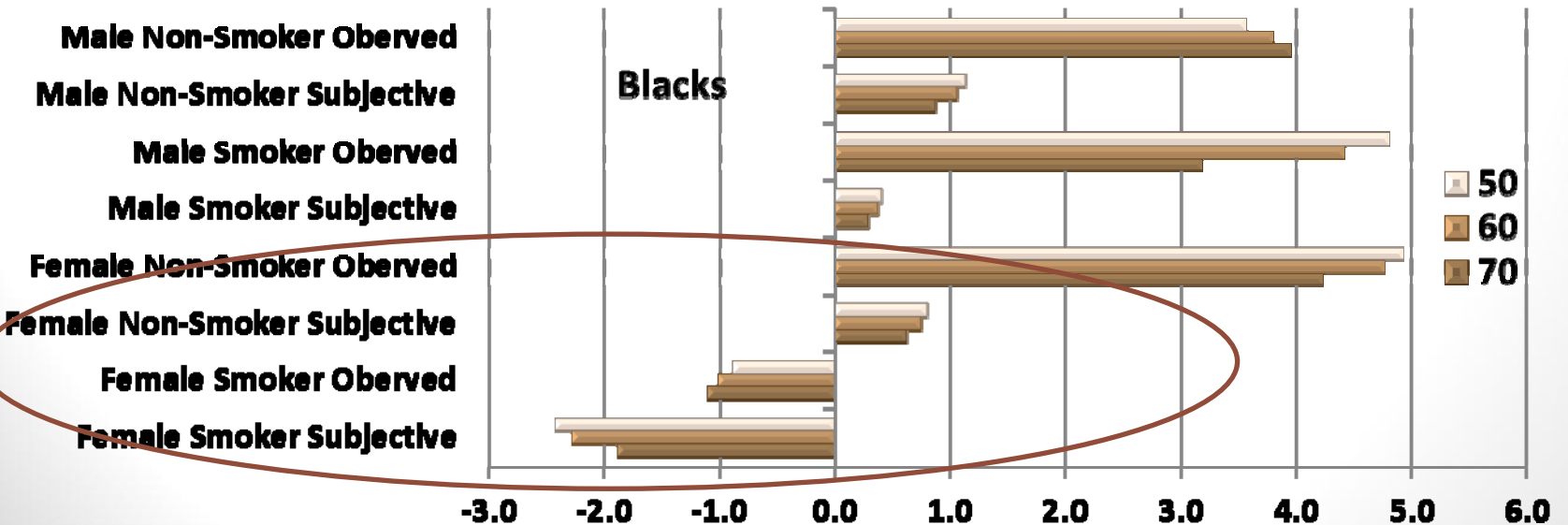
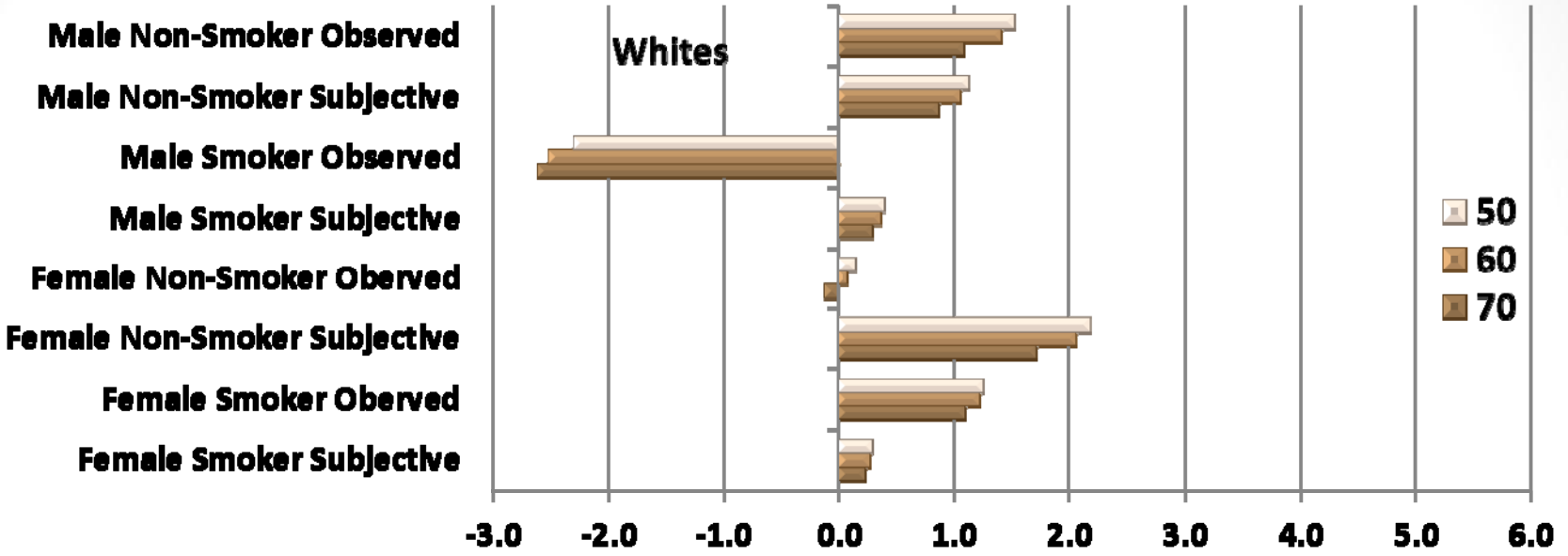
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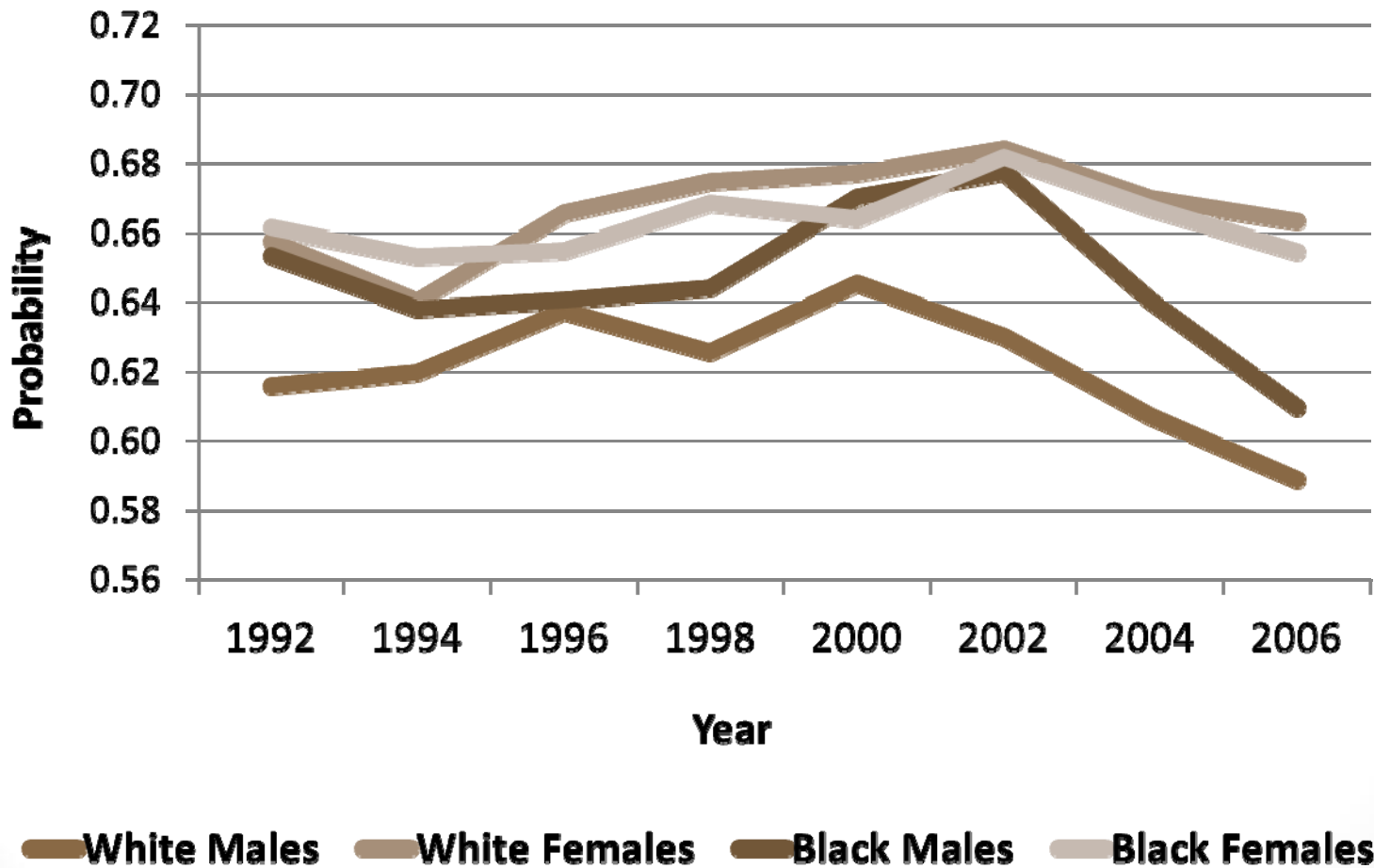
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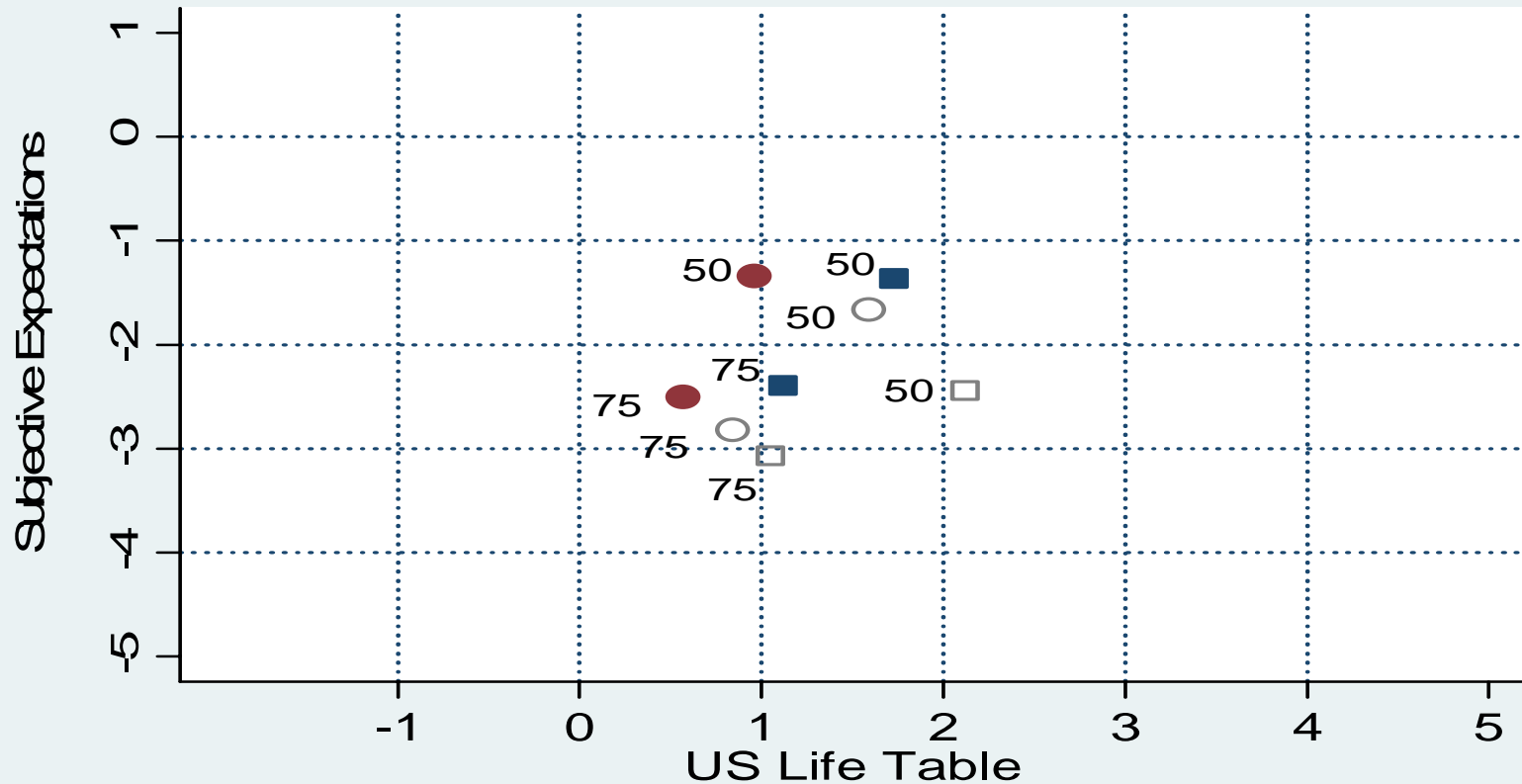
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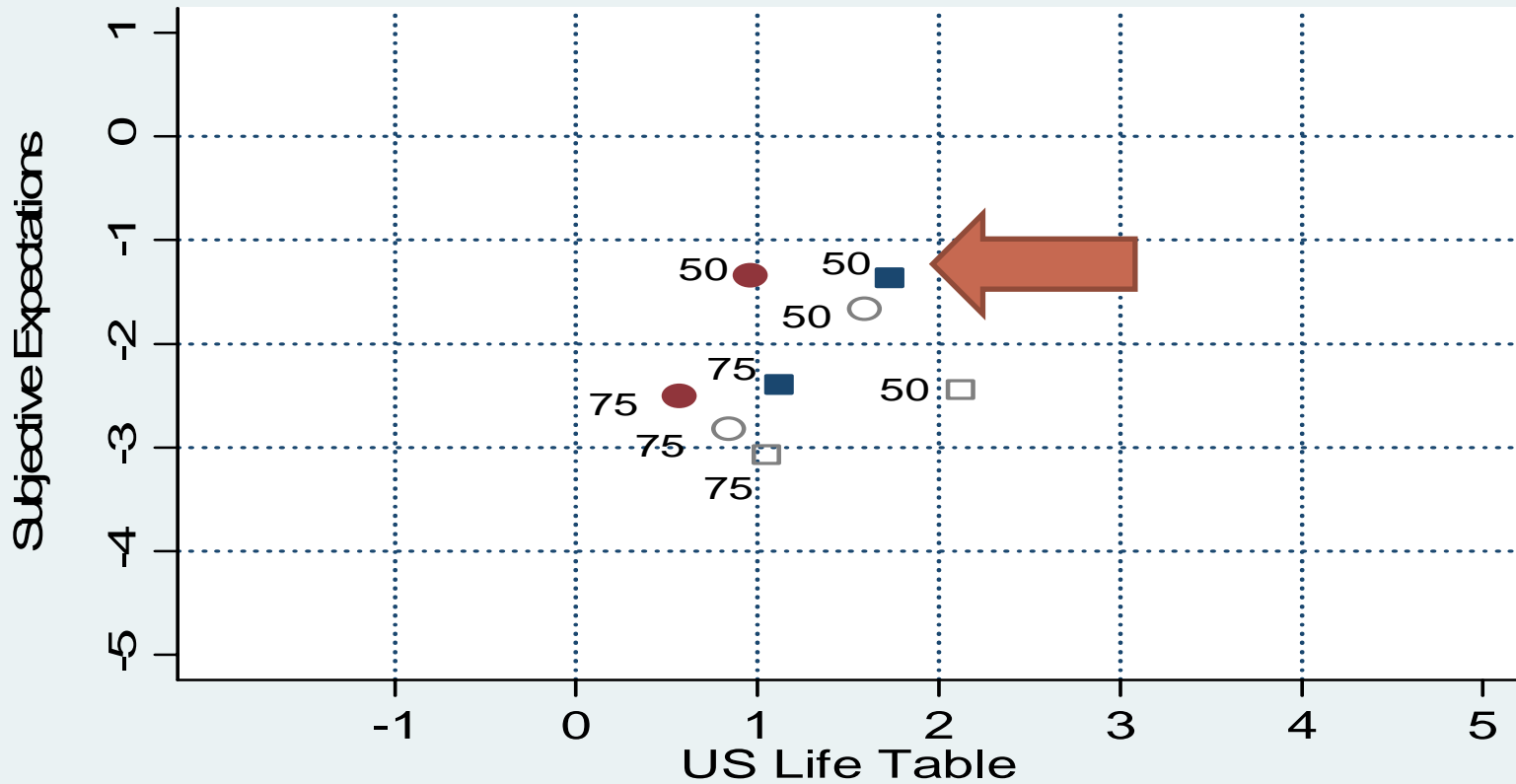
Surviving to Age 75 – Mean Subjective Probability by Race and Gender – Individuals Aged 50-61



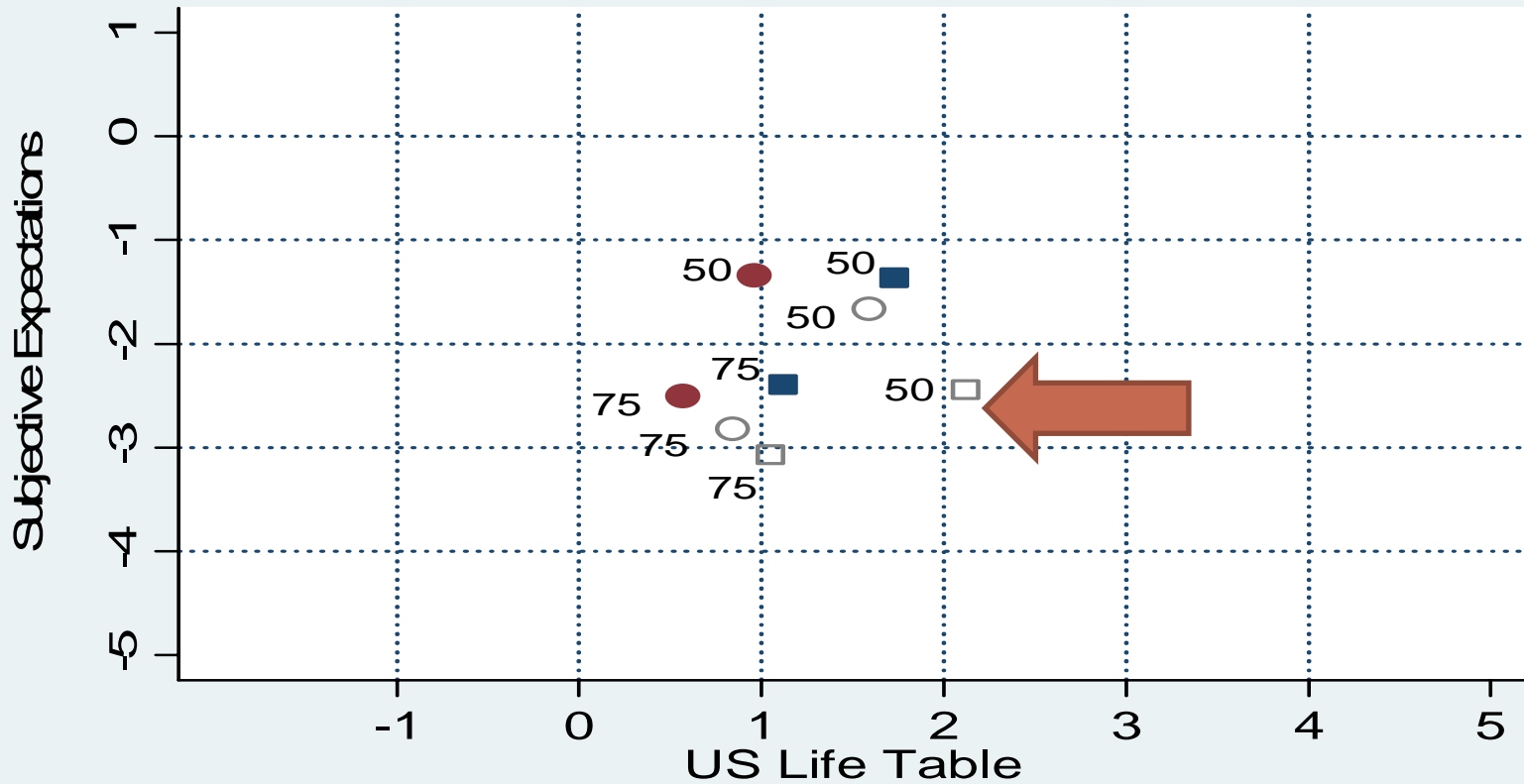
Differences in Life Expectancy between 2004 and 1992 at Ages 50 and 75



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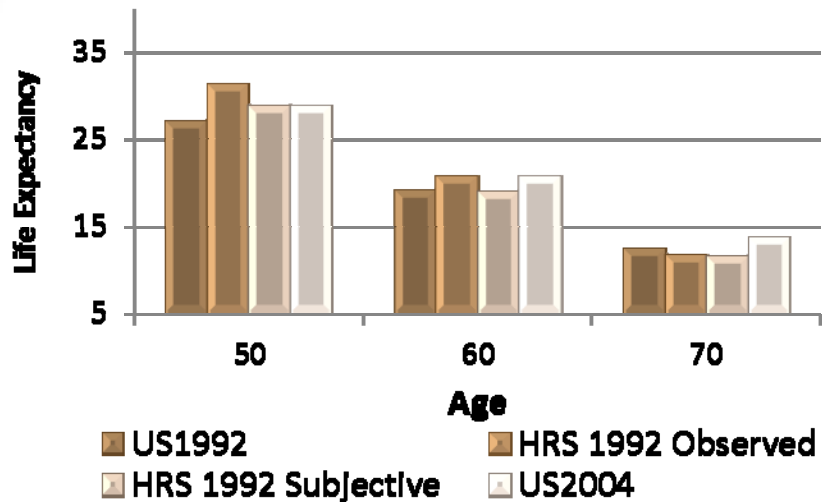


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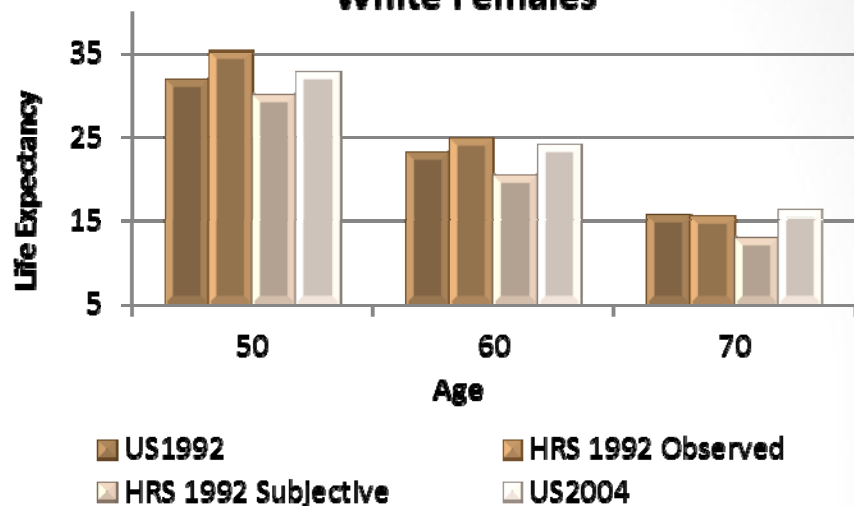


Life Expectancy by Race and Gender – Subjective, Observed, and US Life Tables

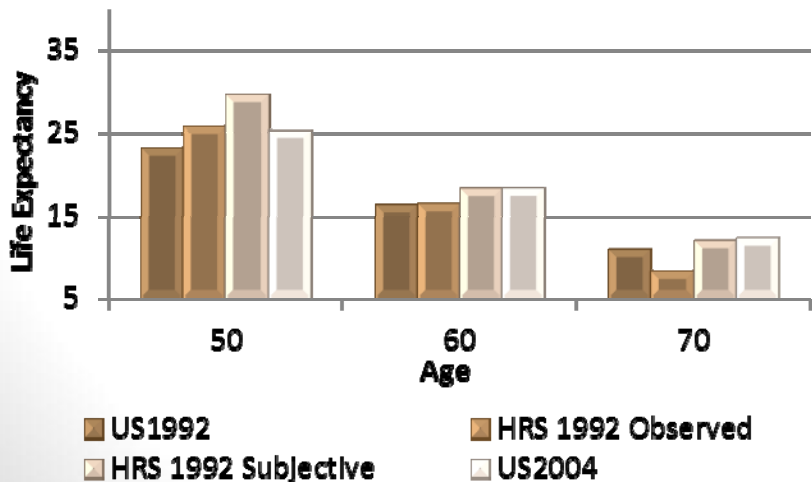
White Males



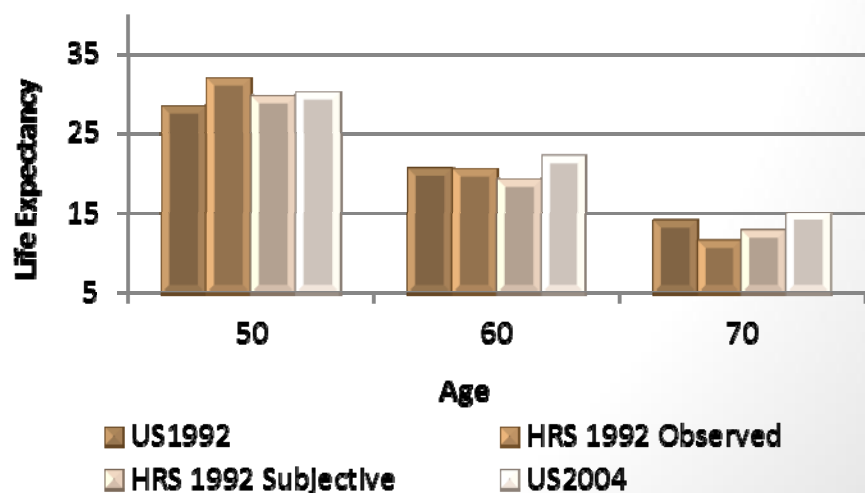
White Females



Black Males

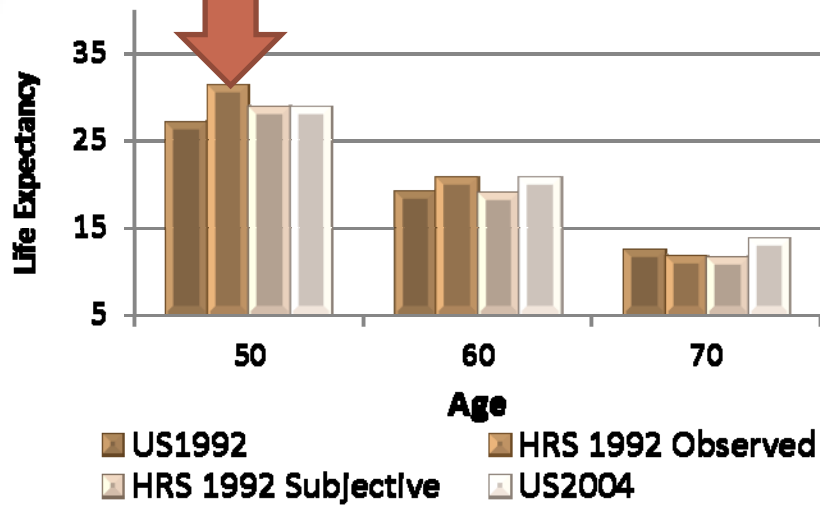


Black Females

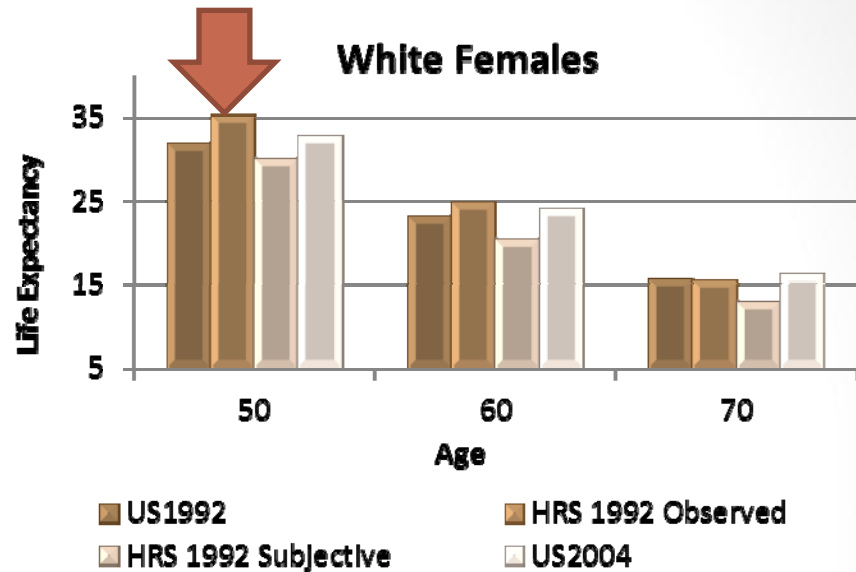


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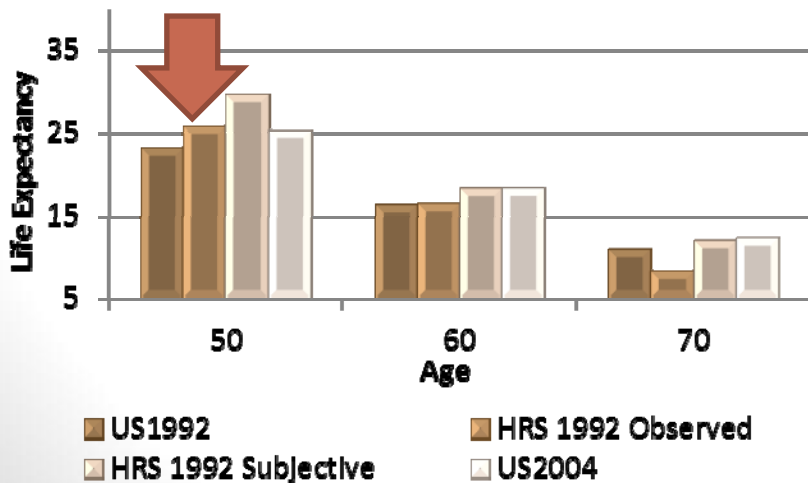
White Males



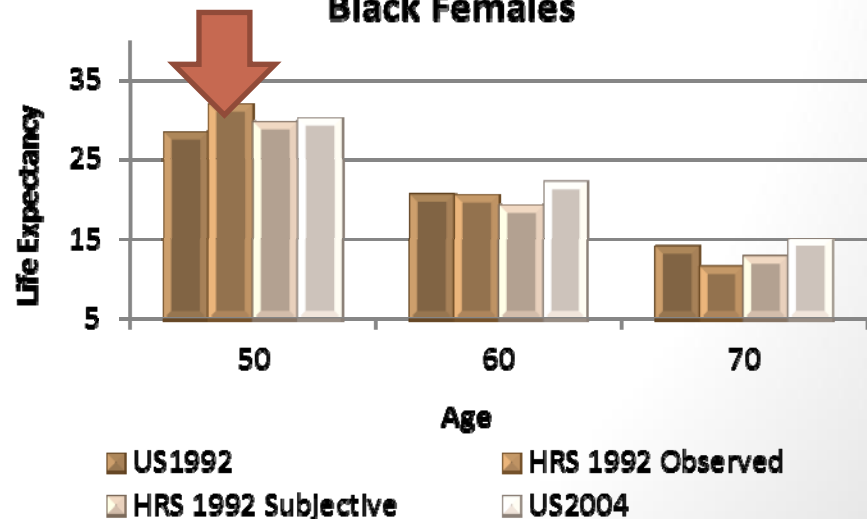
White Females



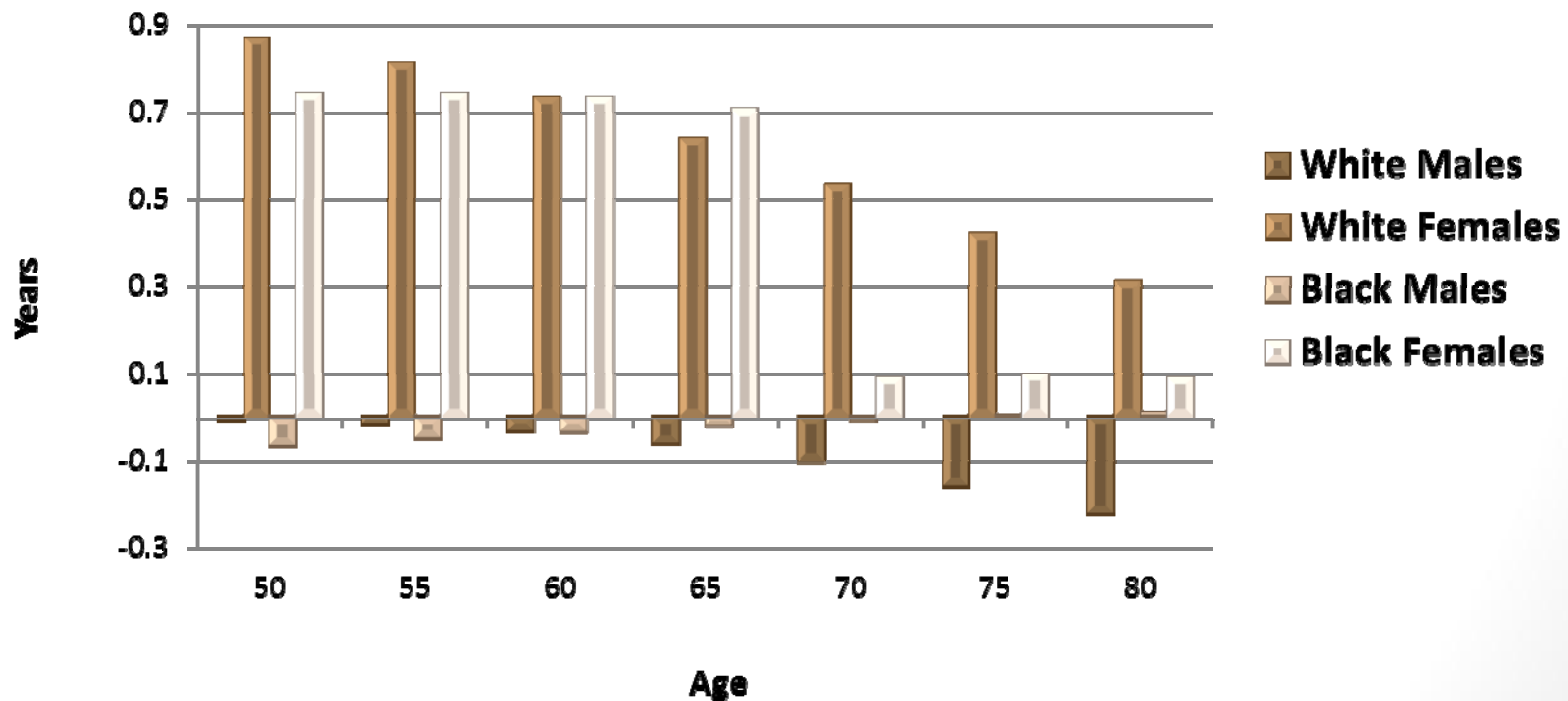
Black Males



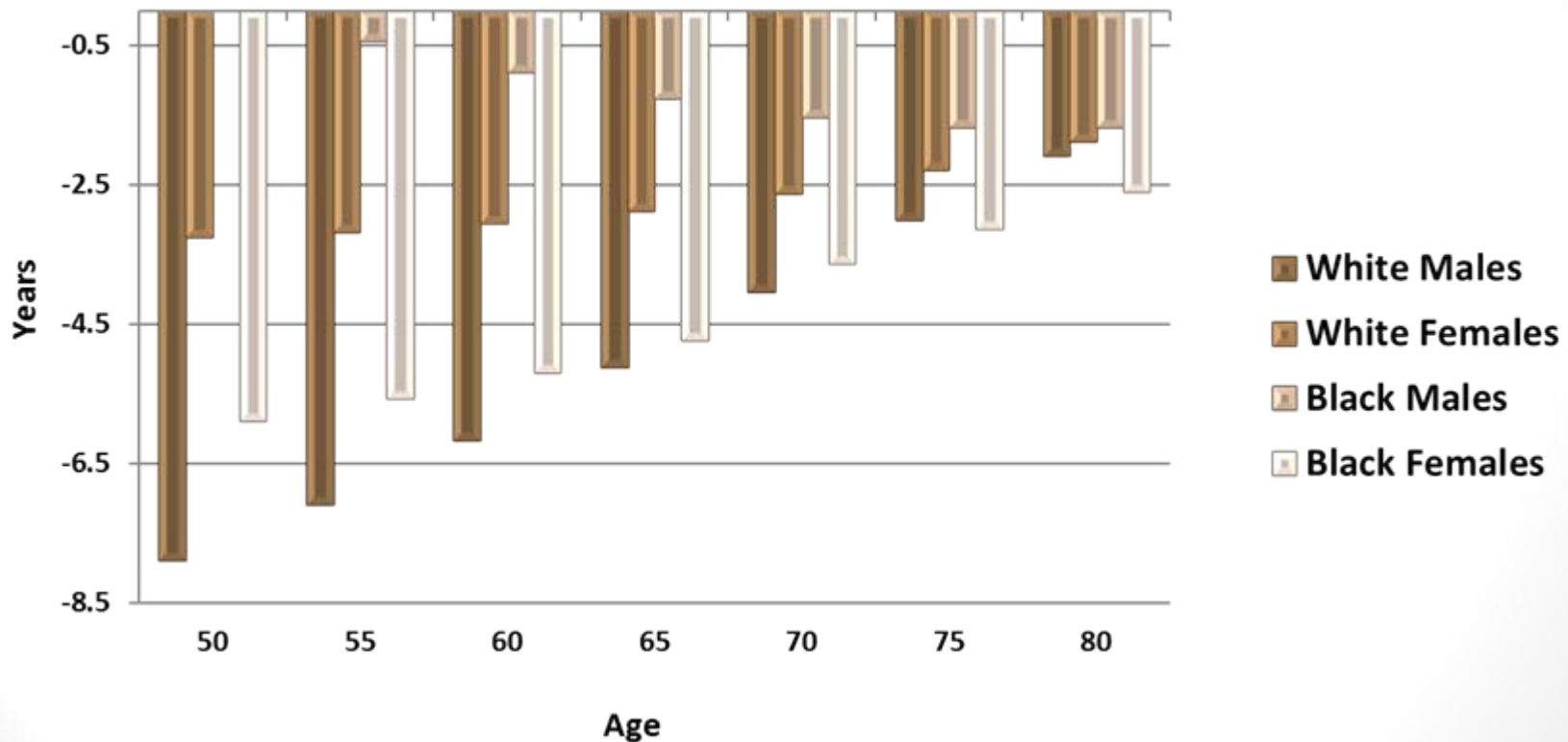
Black Females



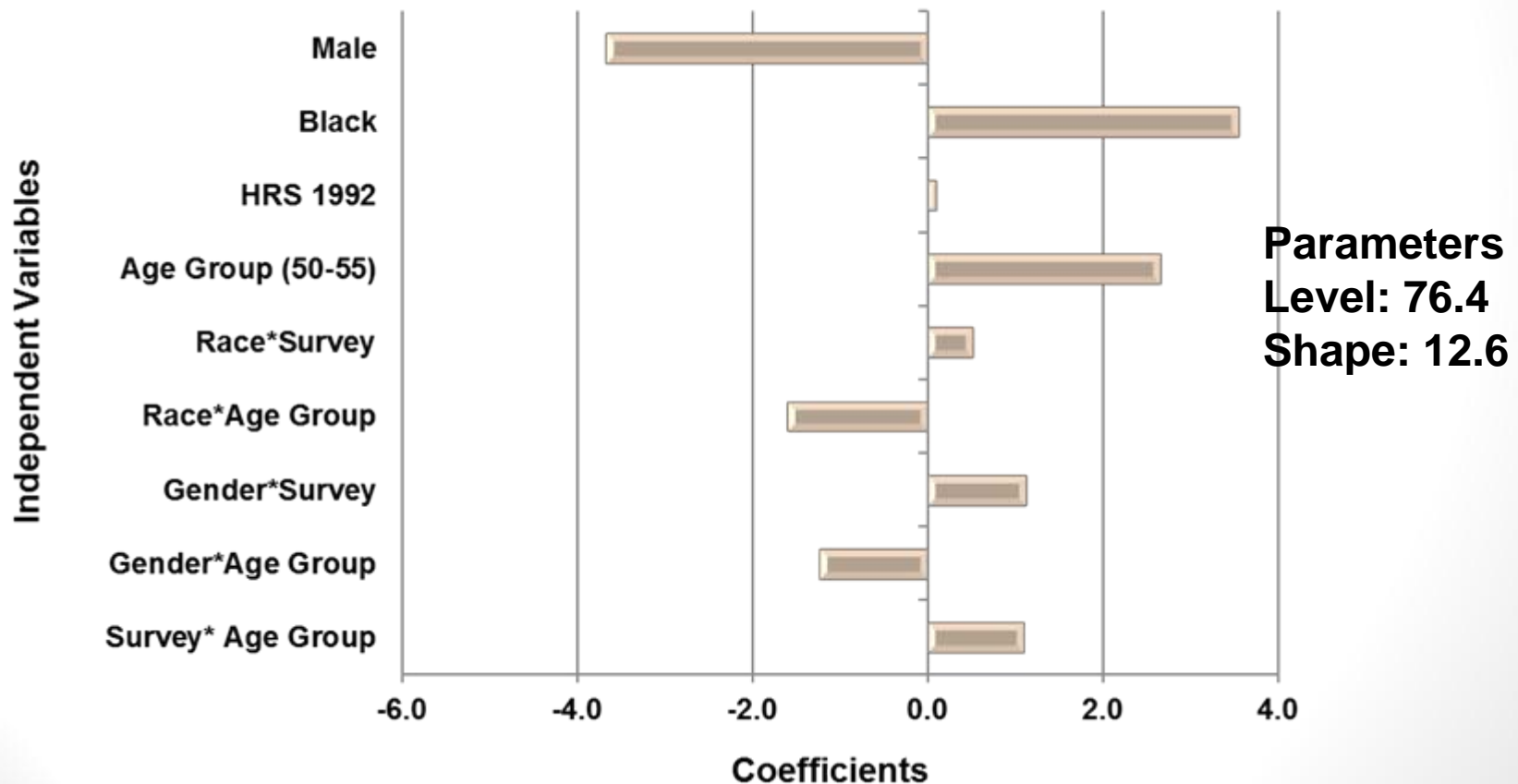
Difference in Subjective Life Expectancy Estimated in 1992 by those Aged 50-61 in 1992 Who Survived to 2004 and by all those Aged 51-61 in 1992 Regardless of Survivorship Status in 2004



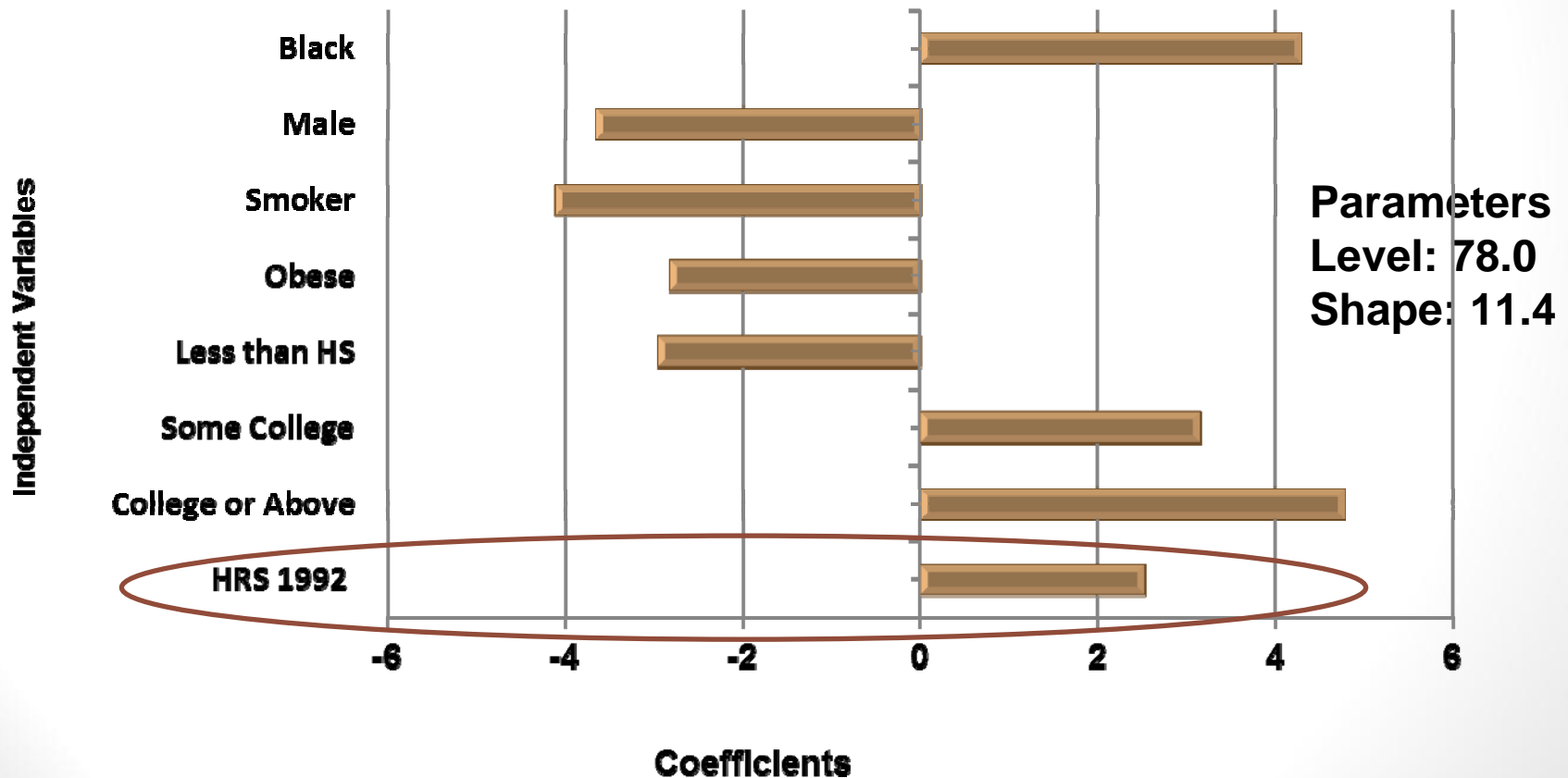
Difference in Subjective Life Expectancy between Estimations done in 2004 by those Aged 62-73 in 2004 who were 50-61 in 1992 and Estimations done in 1992 by the Same Individuals



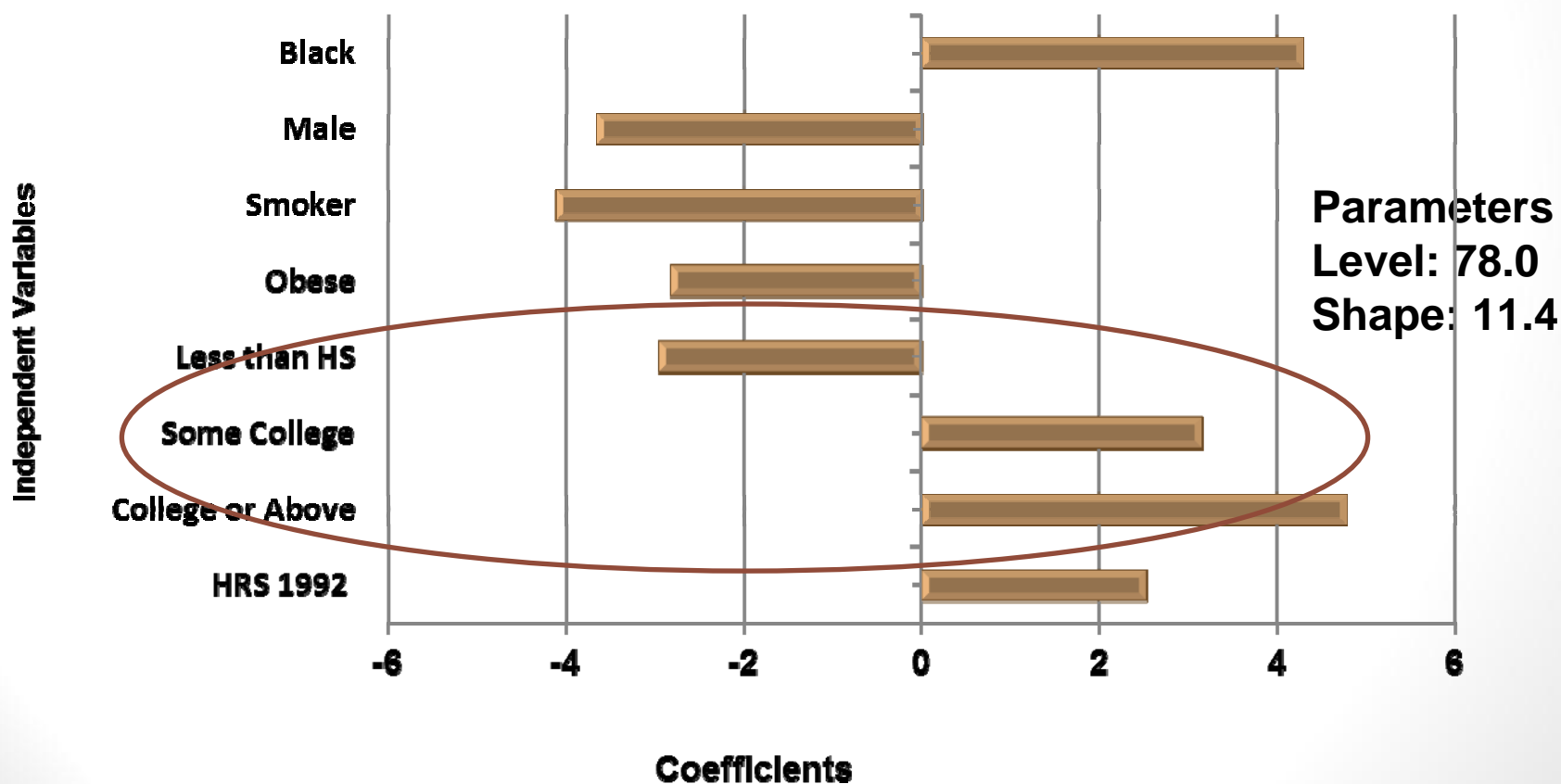
Subjective Survival – NLS – Dependent Variable: Subjective Survival Probability – Logistic Function – Pooled HRS 1992 and 2004 – Individuals 50-61 in 1992



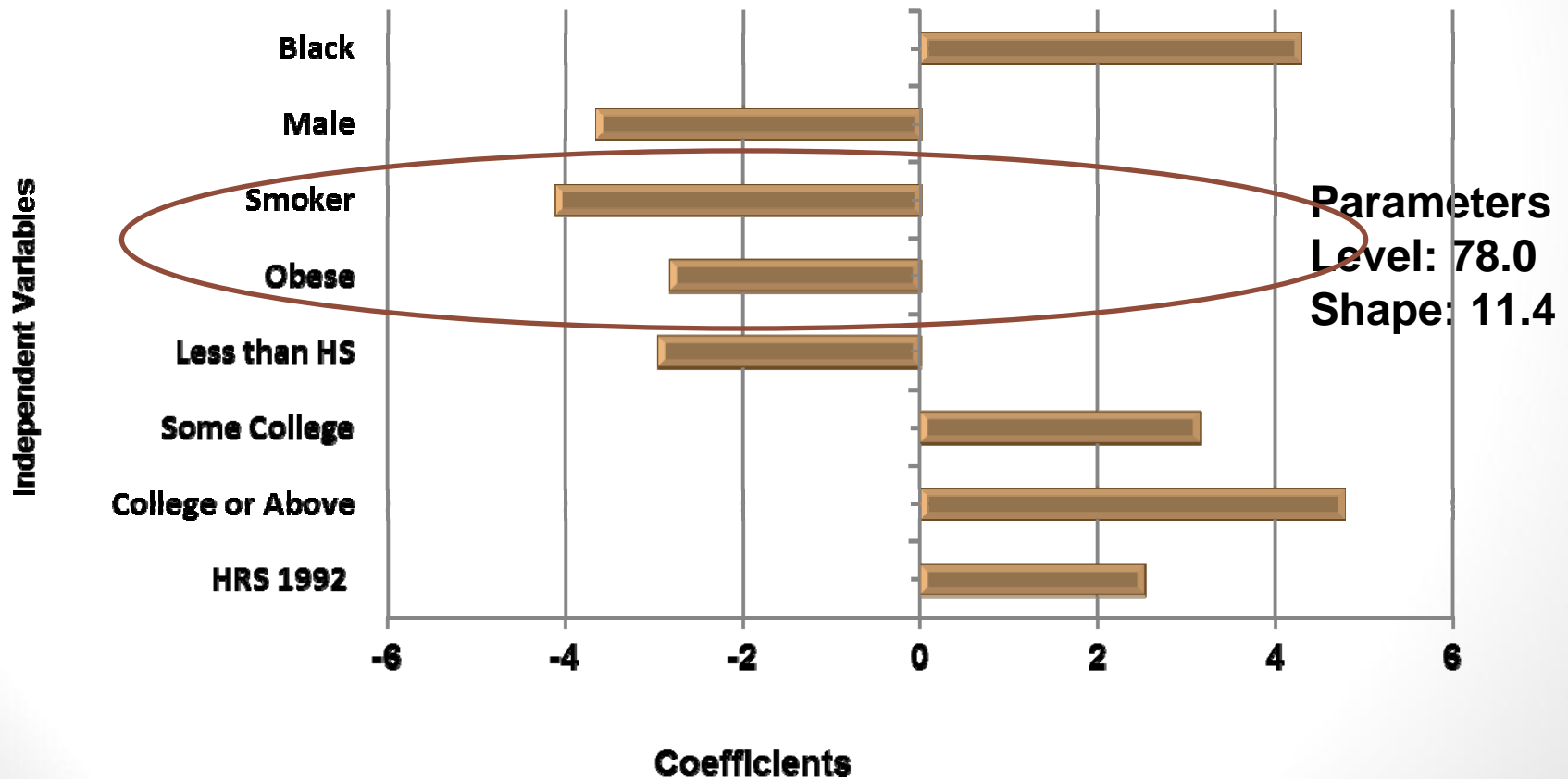
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Updating Survival Expectations: Proportional Hazard Model

$$S_{t+k}(x+k, y) = [S_s(x+k, y)]^{\exp(\beta z)}$$

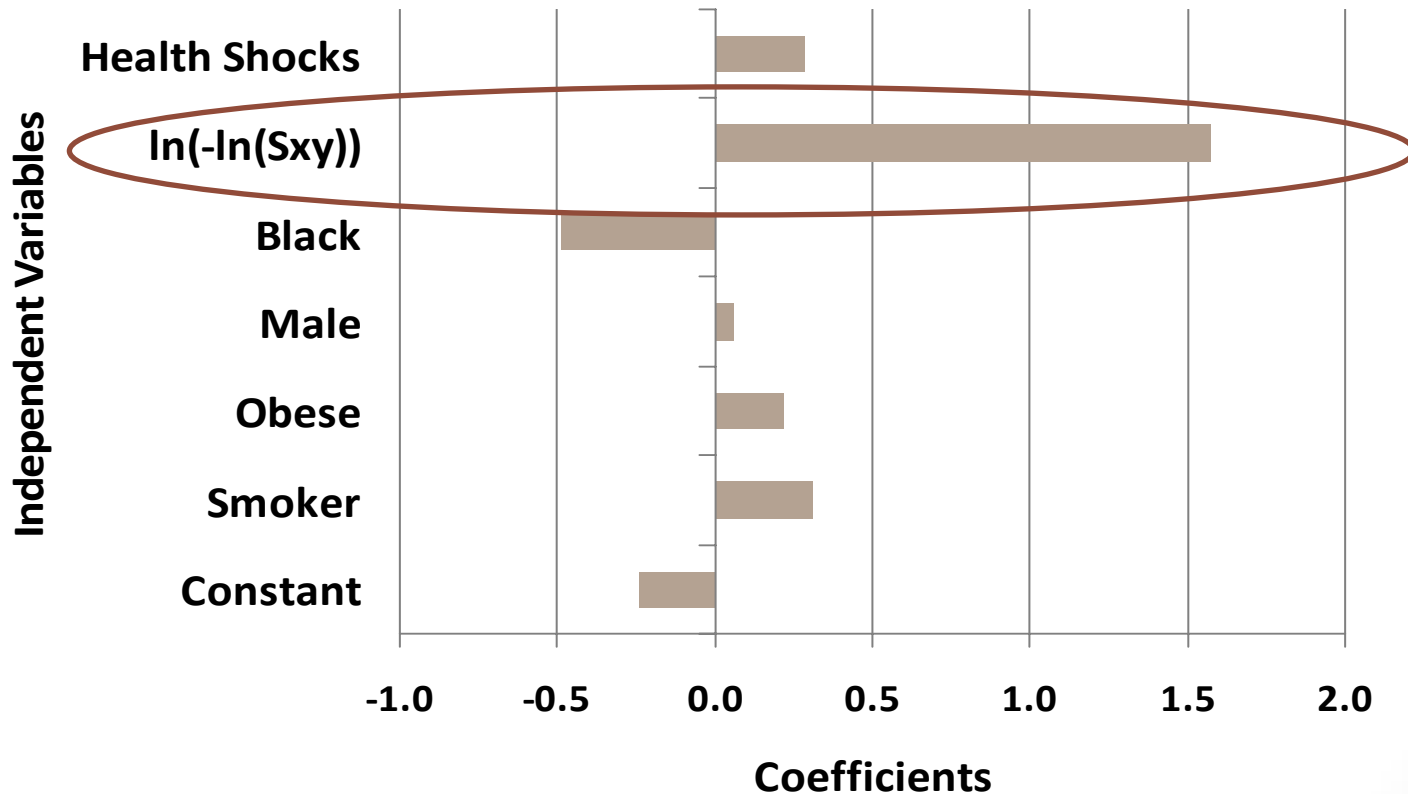
Updating Survival Expectations: Proportional Hazard Model

$$S_{t+k}(x+k, y) = [S_s(x+k, y)]^{\exp(\beta Z)}$$

$$\ln(-\ln(S_{t+k}(x+k, y))) = \beta Z + \ln(-\ln(S_s(x+k, y)))$$

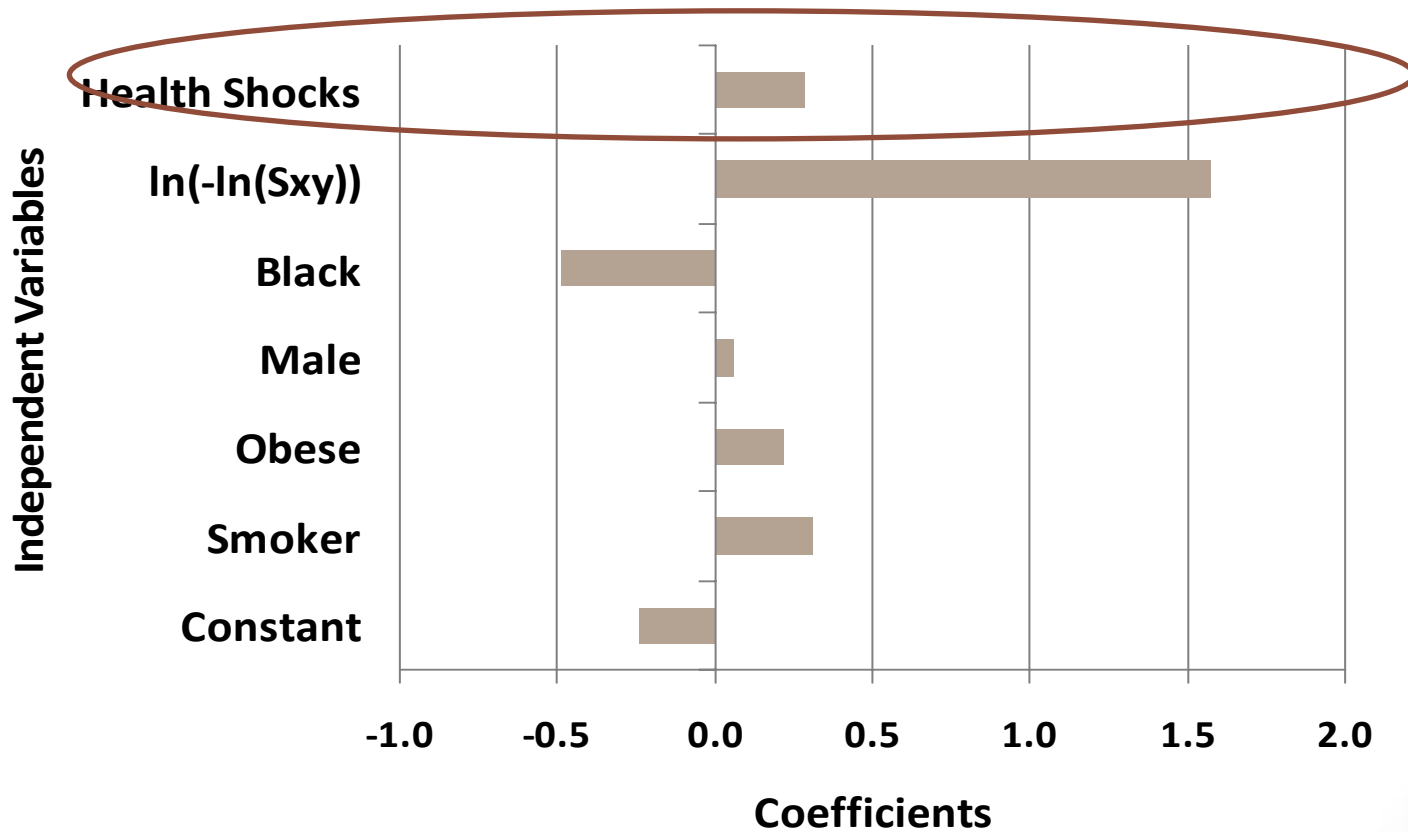
Updating Survival Expectations: OLS-

Dependent Variable: $\ln(-\ln(S_{t+k}(x+k,y)))$ –
Independent Variables: $\ln(-\ln(S_s(x+k,y)))$ in
1992 and Covariates



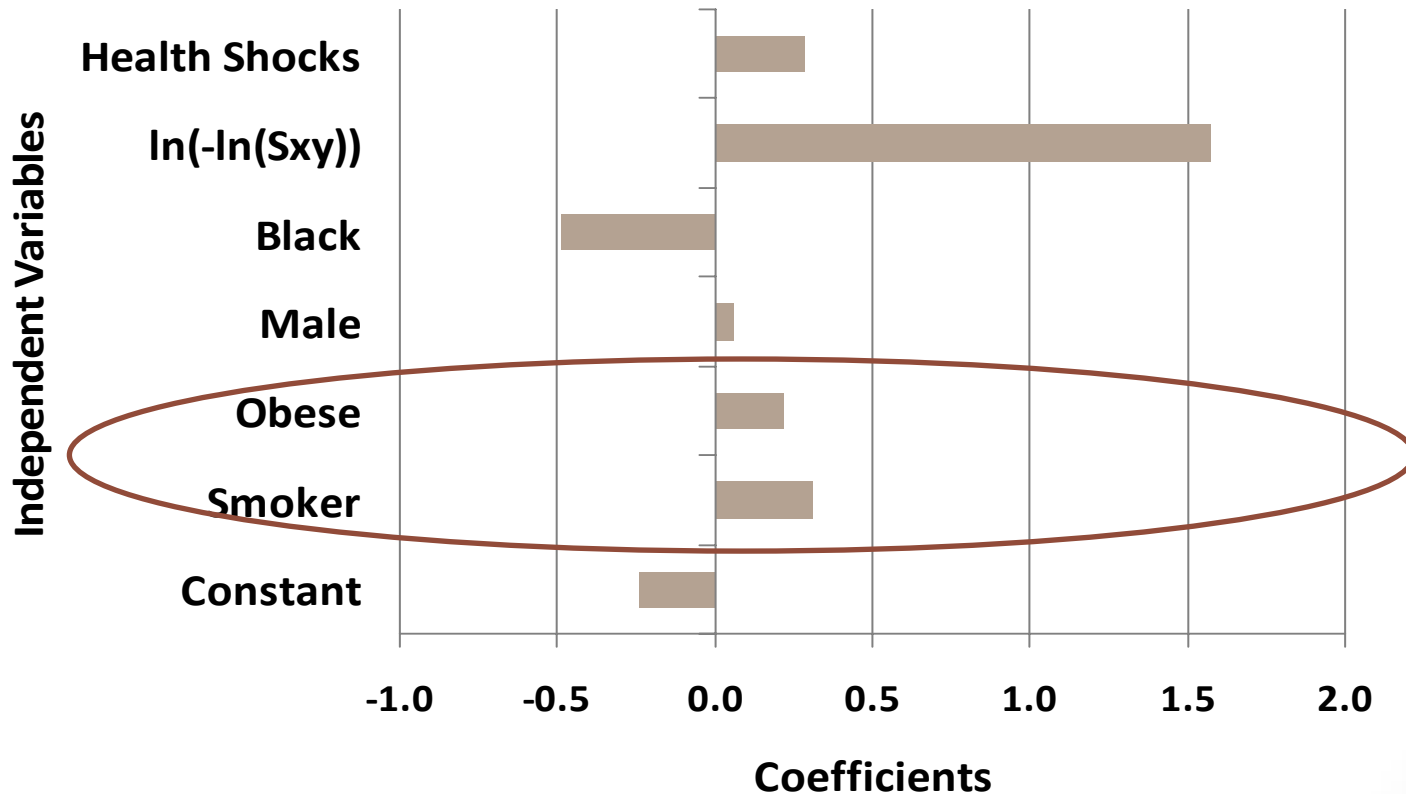
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Conclusions

- Whites are more pessimistic than Blacks and women more pessimistic than men
- Subjective probabilities are remarkably close to actual life tables
- Pessimism increases with age
- Unexplained pessimism in more recent cohorts (1992 versus 2004)
- Updating effects strong particularly among those at higher risk

Where to Go from Here

- Model simultaneously $S_x(y)$ and uncertainty focal responses
- Compare subjective with cohort life tables
- Use non-proportional hazard models (accelerated time failure models)
- Compare predicted values from updating models with behavioral changes

THANKS