# Socioeconomic Status, Perceptions of Pain, and the Disparity in SSDI Receipt

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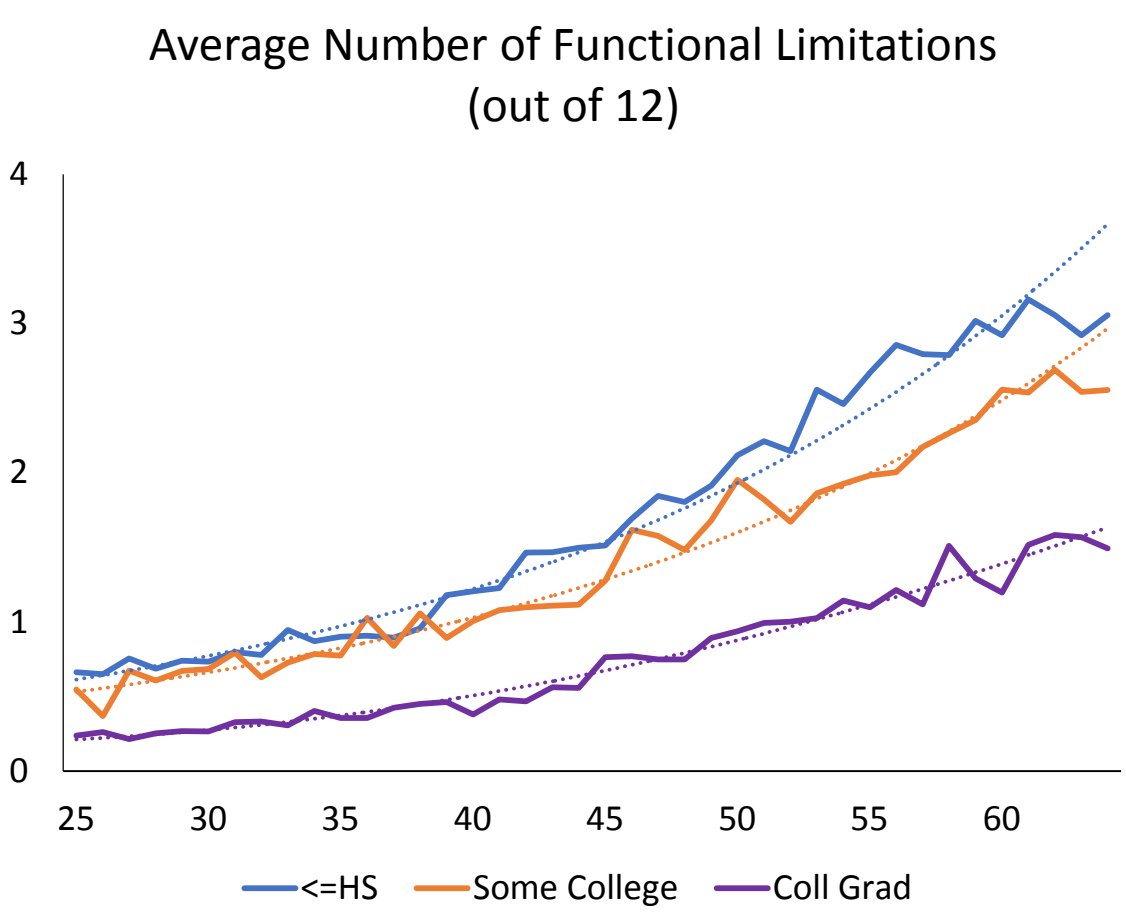
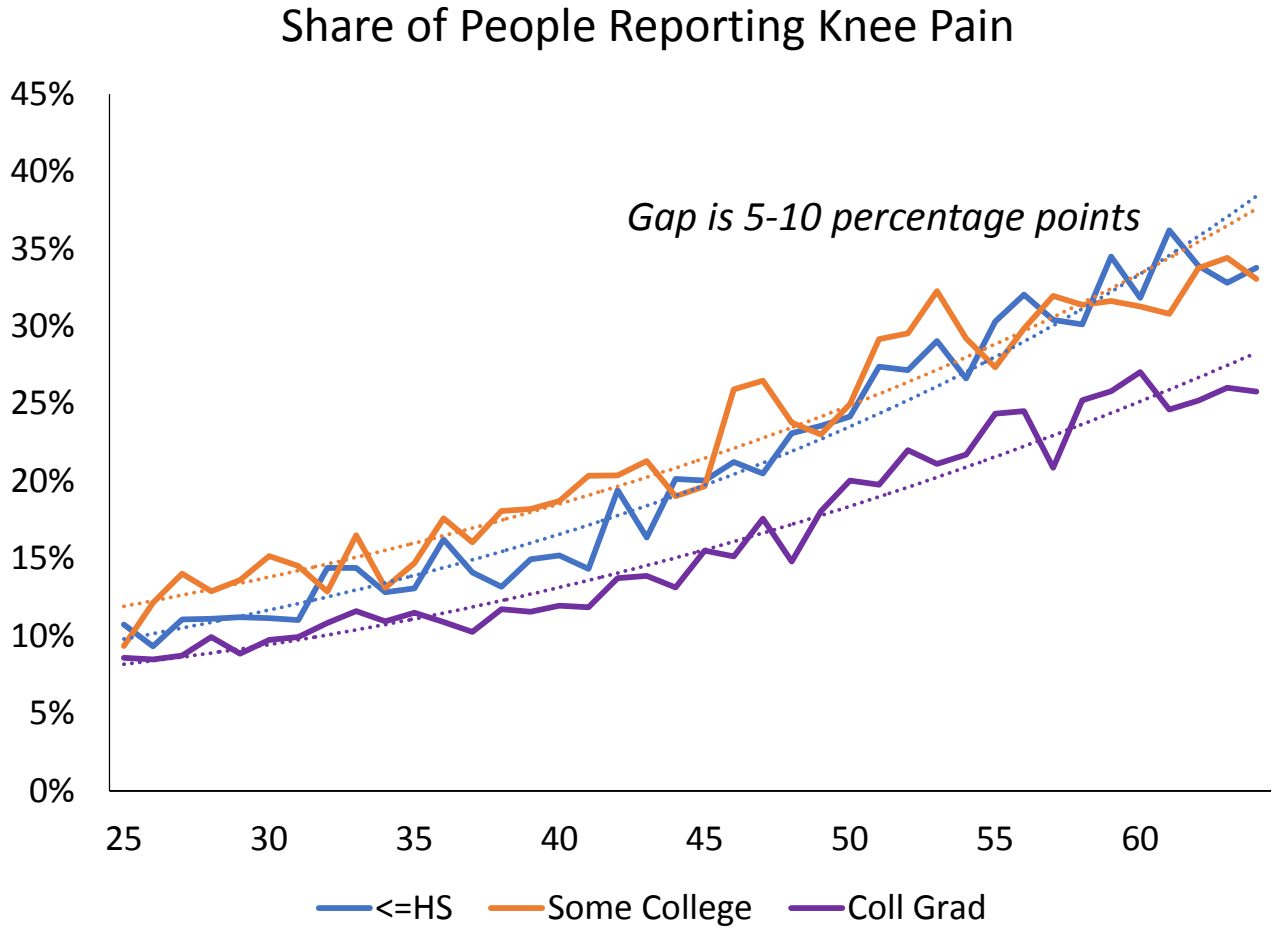
# Large disparity in functional limitations and joint pain by education




Source: NHIS, 2009-16. Functional limitations include walking, climbing, standing, sitting, stooping, reaching, grasping, carrying, pushing, shopping, socializing, and relaxing.

# Why is this? Four theories

I. It's in their knees
   - Knees of less educated people have more structural damage

II. It's in the environment
   - The tasks required of less educated people are more demanding, and this leads to more pain
   - BMI differs by education, and this leads to more pain

III. It's in their head
   - Less educated people have more 'despair' and this influences their pain perception and physical functioning

IV. It's in the medicine cabinet
   - Medical treatments are better for the better educated

# Theory I: Is it in their knees?

- National Health and Nutrition Examination Survey III (1988-94)
  - Ages 60-74
  - N=3,886 people (~1,578 with x-rays; only during 1991-94)
  - X-rays to measure knee arthritis. Score using Kellgren-Lawrence (KL) Classification

    0=Normal

    1=Doubtful/Possible

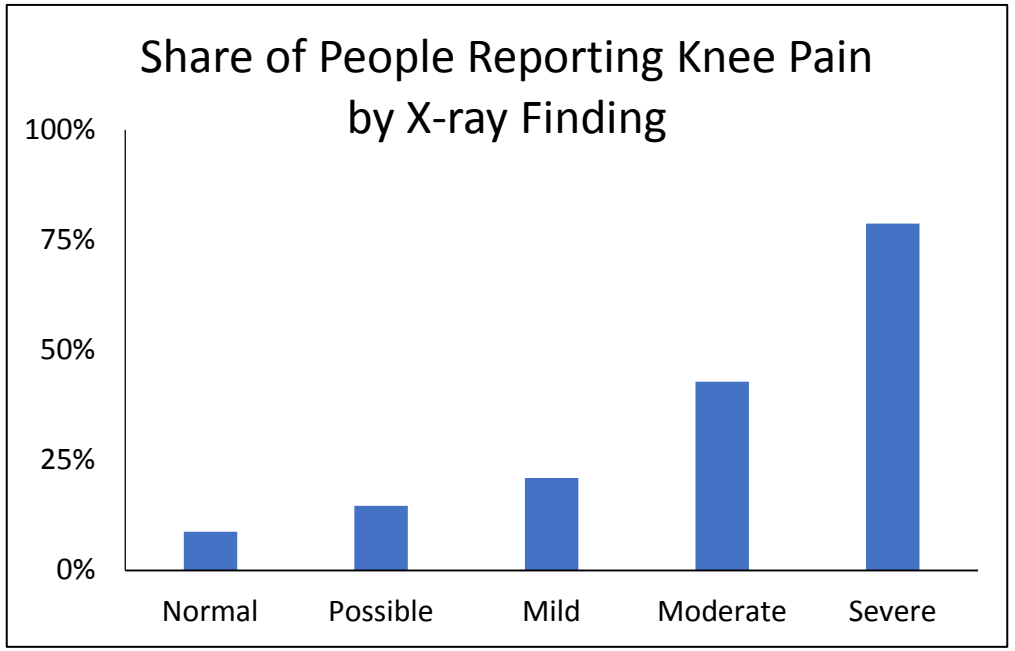
    2=Mild

    3=Moderate

    4=Severe

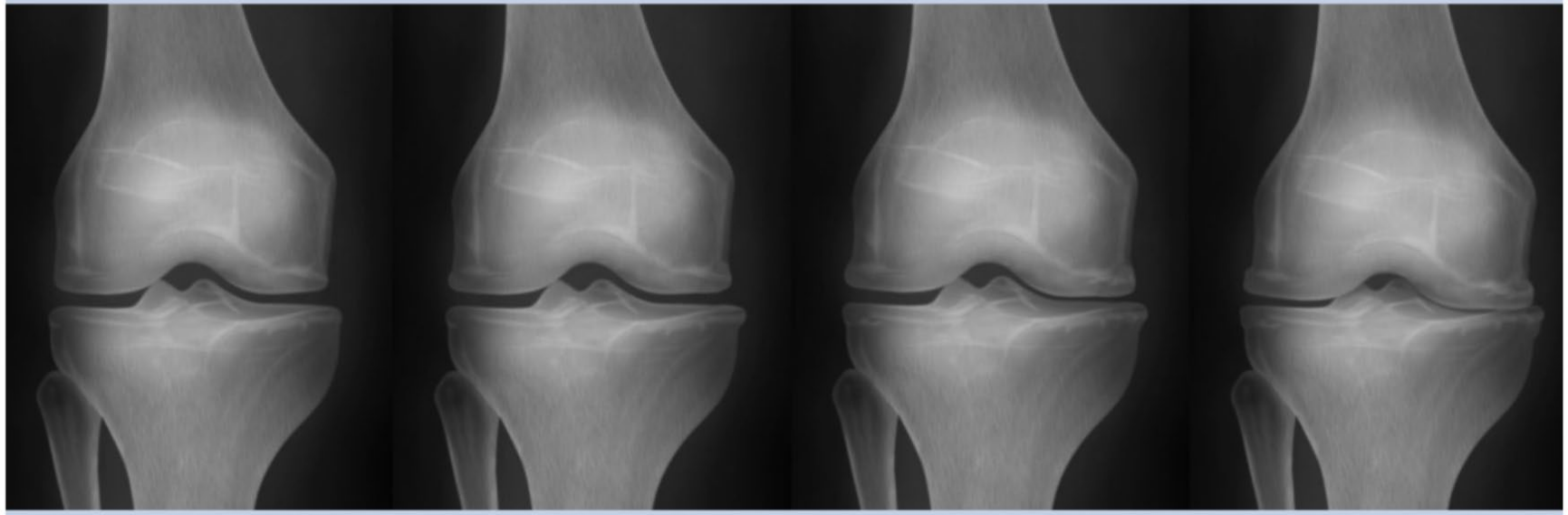
    } Arthritis

  - Two education groups: ≤HS, CG
  - All findings age/sex/race adjusted



# Images of arthritic knees

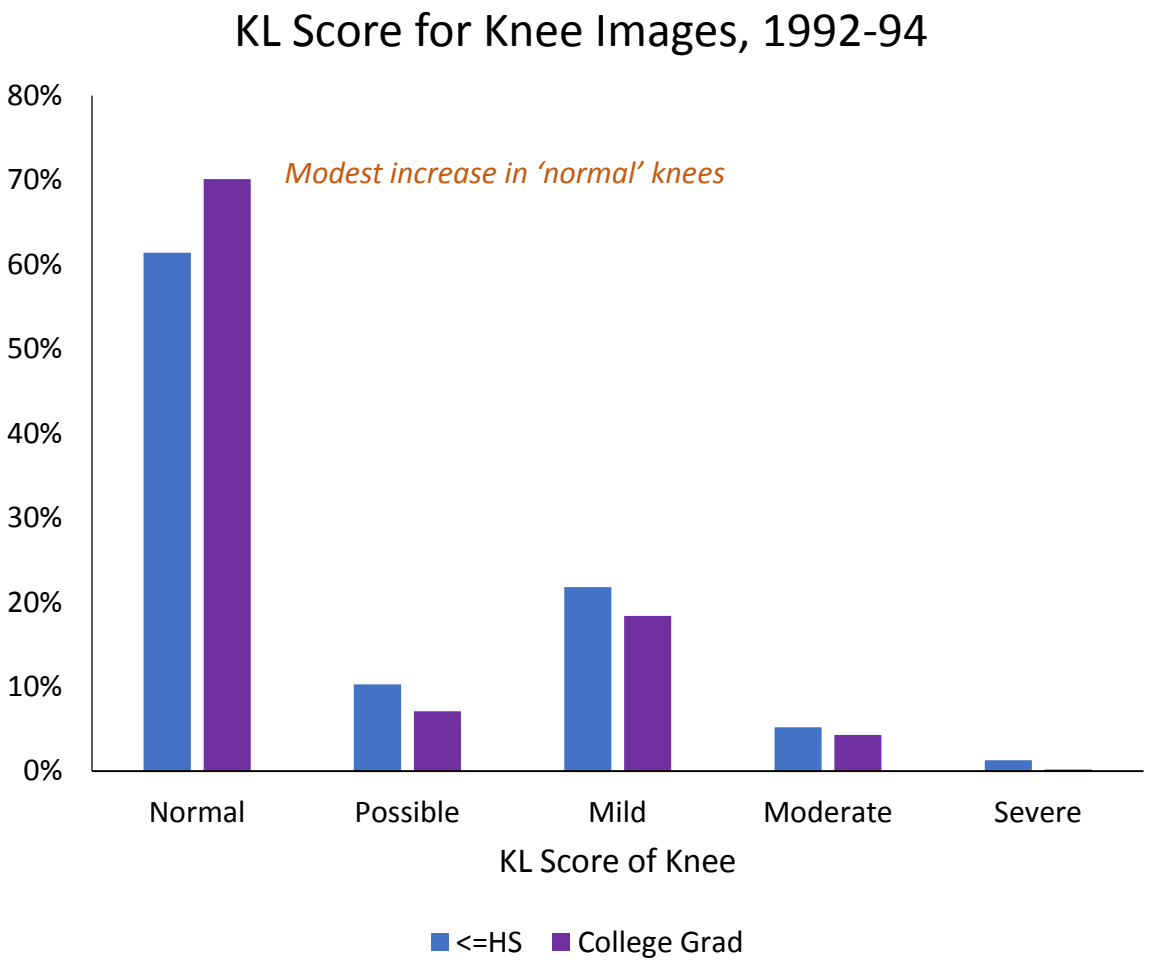
**Kellgren-Lawrence (KL) grading scale**

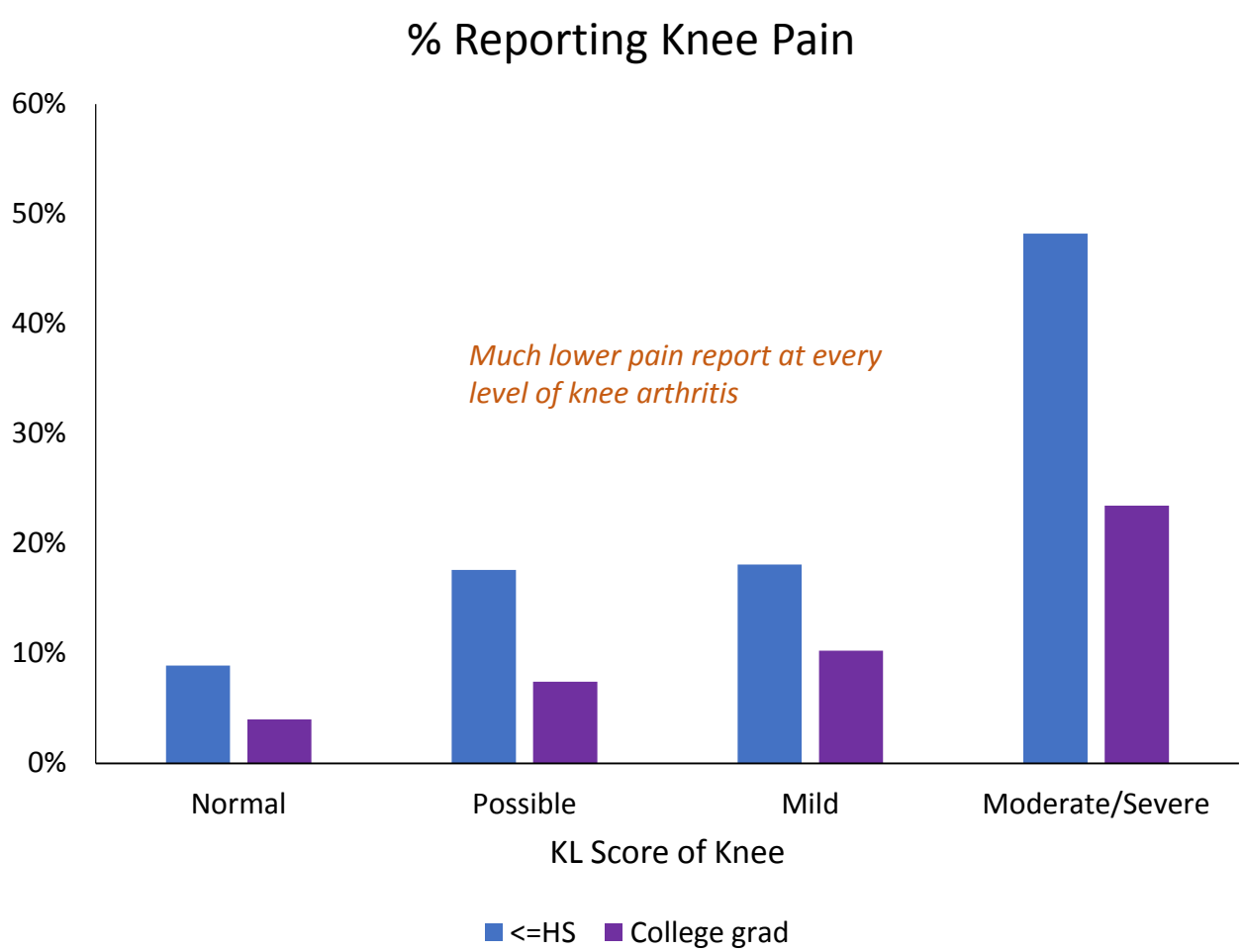


**Grade 1** **Grade 2** **Grade 3** **Grade 4**

| CLASSIFICATION | Normal | Doubtful | Mild | Moderate | Severe |
|---|---|---|---|---|---|
| DESCRIPTION | No features of OA | Minute osteophyte: doubtful significance | Definite osteophyte: normal joint space | Moderate joint space reduction | Joint space greatly reduced: subchondral sclerosis |

# Images of knees differ only slightly by education. Almost all of the difference is pain conditional on severity

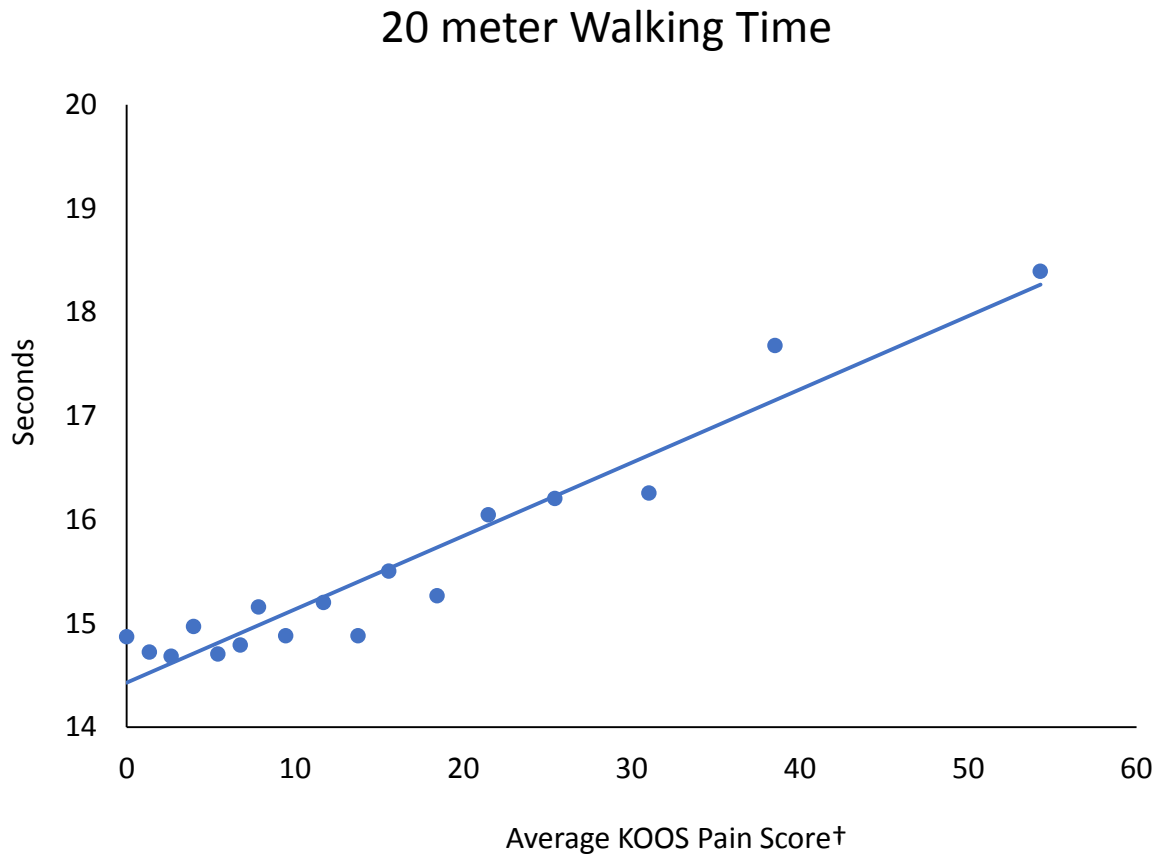



*~85% of the difference in pain is a result of lower pain reports given the degree of arthritis, not the amount of arthritis.*

# Is it just reporting? Unlikely

- Very specific pain reports
- Doesn't go away at retirement
- Self-reported pain tolerance does not differ by education
- Pain report is correlated with physical functioning




† Pain score is subtracted from 100 so that a higher value corresponds to more pain.

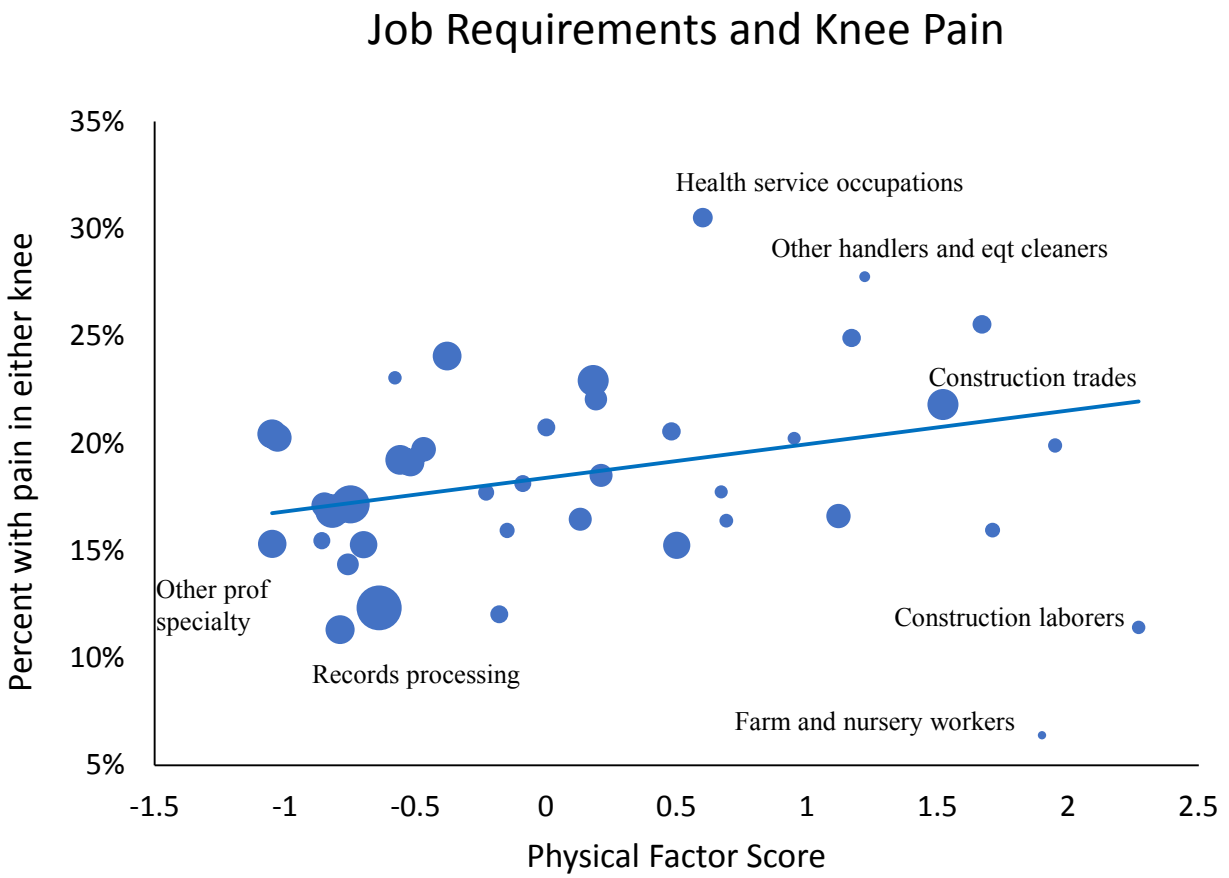
# Theory II: Environmental characteristics

- Continuous NHANES has information on longest job worked
  - 40 2-digit occupations (e.g., Textile, apparel, and furnishings machine operators)

- Matched to characteristics of jobs from 1977 Dictionary of Occupation Titles (England and Kilbourne)
  - Principal factor from strength, climbing, stooping, reaching

# Knee Pain and Physical Requirements on the Longest Job

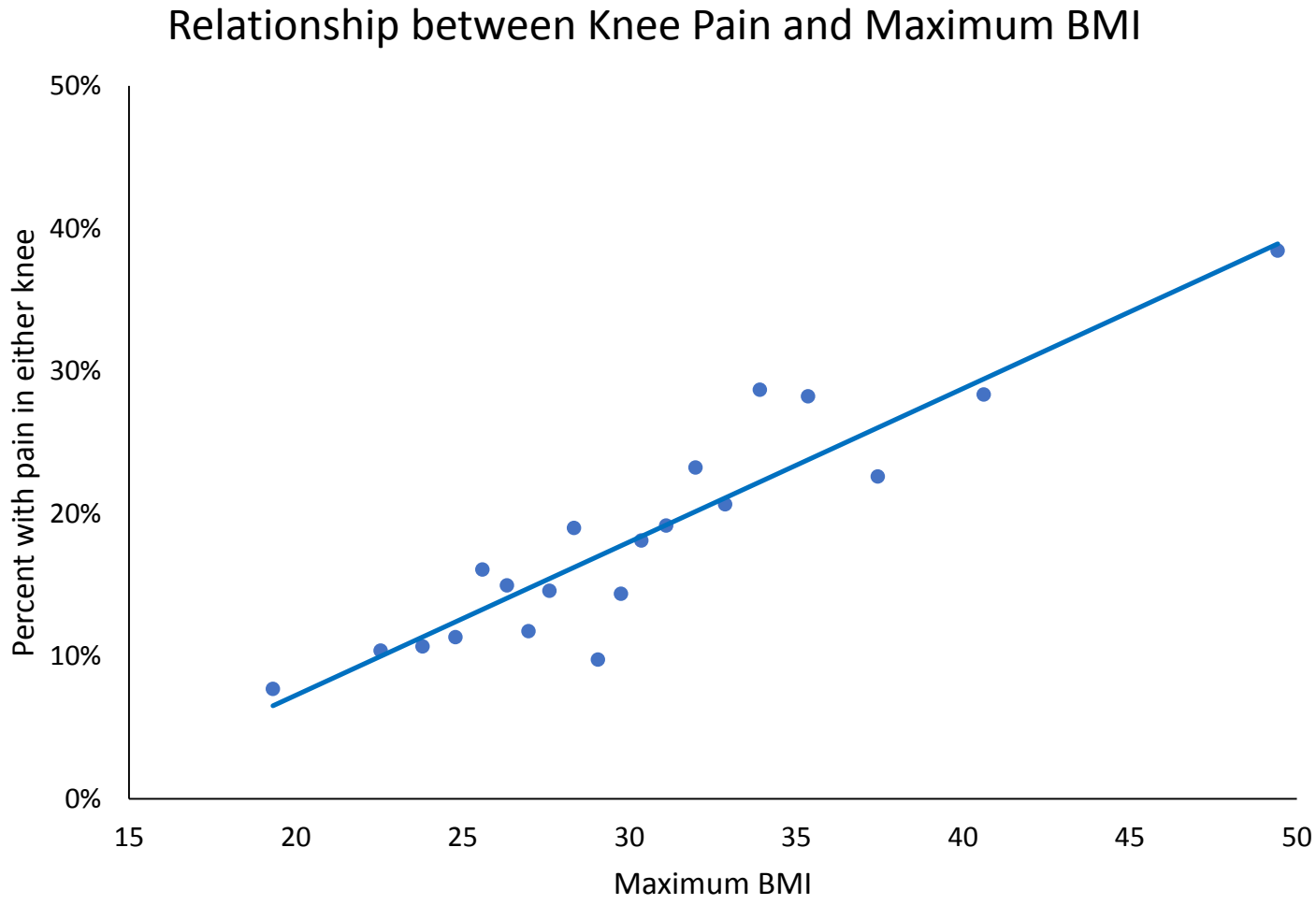
- Job demands are correlated with knee pain.
  - Other joints too, but biggest effect is for knee and hip pain.
- This is NOT true for measures of abstract / routine / manual jobs from Autor et al.
- About **1/3 of the difference** in knee pain is a result of differences in physical requirements on the job.




Data from continuous NHANES, 1999-2004, ages 45-74. Includes people with a longest job that is not in the military.

# Obesity

- Knee pain is highly correlated with maximum BMI.
  - Also current BMI conditional on maximum BMI
- This is independent of the effect of job demands.
- About **1/3 of the difference** in knee pain by education is due to higher rate of obesity.




Data from continuous NHANES, 1999-2004, ages 45-74.

# Theory III. It's in their heads (despair)

- MIDUS: Midlife in the US (N~4,000)
  - Surveyed in mid-1990s (wave A); resurveyed in mid-2000s (wave B) and mid-2010s (wave C)
  - Keep people aged 45-74 in last wave.
  - Dependent variable, Wave C: "Do you have chronic pain, that is do you have pain that persists beyond the time of normal healing and has lasted from anywhere from a few months to many years?"
    - "Where is your pain primarily located – knees?"
  - Relate chronic pain in wave C to obesity in wave B, job chars in wave B, and psychological status in wave B

# Psychological measures

- Life satisfaction (0-10 scale)
- Affect: positive and negative (1-5 scale)
- Control: Personal mastery + perceived constraints (1-7 scale)
- Psychological well-being (1-21 scales)
  - Positive relations with others
  - Self-acceptance
  - Autonomy
  - Personal growth
  - Environmental mastery
  - Purpose in life

- Many of these differ by education, but the relationship with knee pain is modest.
- Only **10% of difference** in knee pain by education is associated with psychological well-being.

# Theory IV: It's in the medicine cabinet

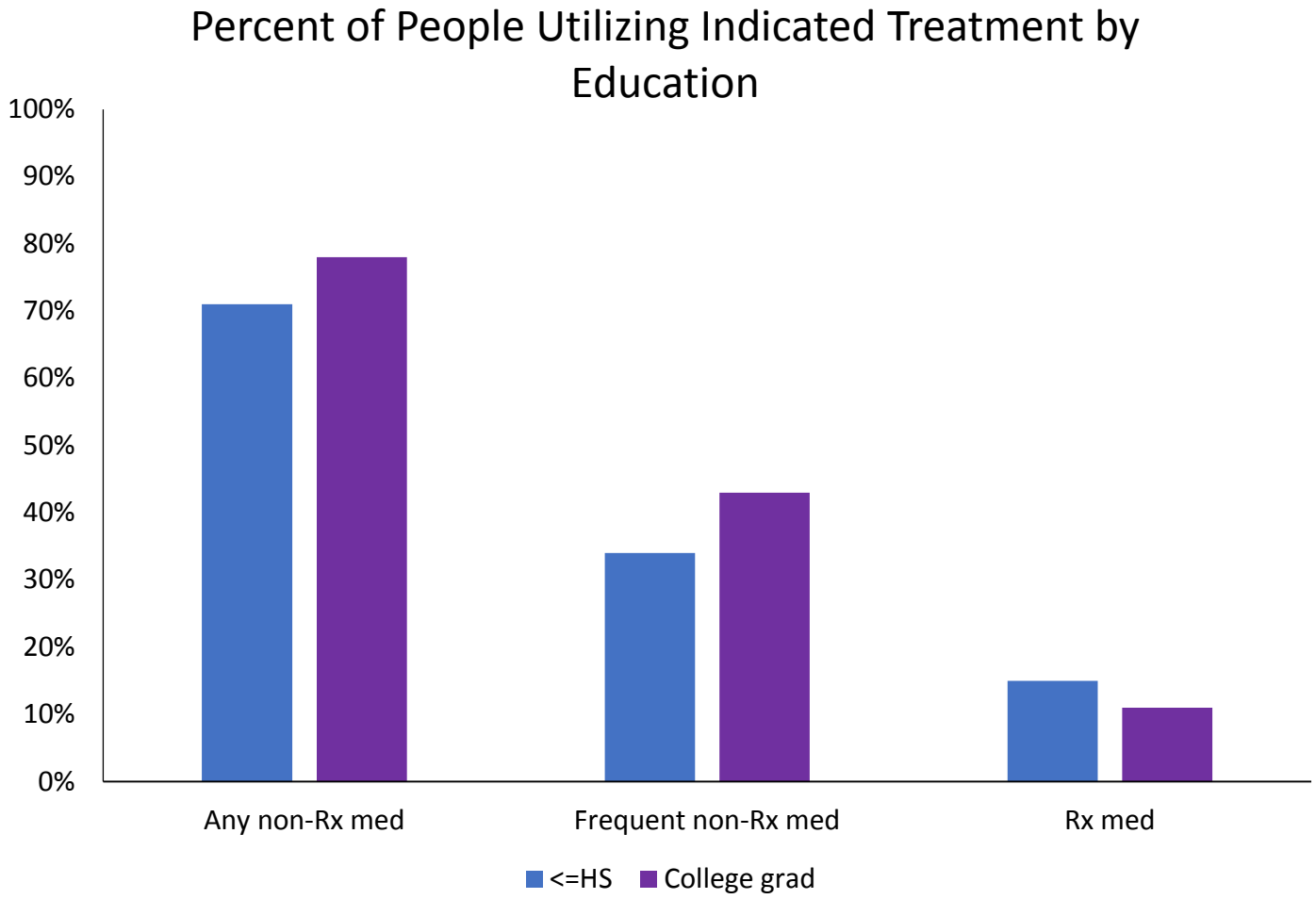
- Treatment for knee pain has historically been limited in use or not very effective.
  - Non-prescription medications (Ibuprofen, Acetaminophen)
  - Prescription pain relievers (Vioxx, OxyContin)
  - (Later) knee replacement

- NHANES asks about some of these:

| Any aspirin, Ibuprofen, Acetaminophen* | Frequent use (>=10 times)* | Any prescription pain reliever* | Knee replacement |
|---|---|---|---|
| 72% | 36% | 14% | 0.5% |
| *Past month | | | |

# Treatment rates vary little by education

- Treatment rates do not differ greatly by education.
- Hard to tell about efficacy because of endogeneity of treatment.
  - People with more pain use more pain-related care.



# Summary of results

- It's in their knees
  - Knees of less educated people have more structural damage
- It's in the environment (~2/3 of the difference in knee pain by education)
  - The tasks required of less educated people are more demanding, and this leads to more pain
  - BMI differs by education, and this leads to more pain
- It's in their head
  - Less educated people have more 'despair' and this influences their pain perception and physical functioning
- It's in the medicine cabinet
  - Medical treatments are better for the better educated
  - NOT a big deal in this setting.

# Implications

- For SSDI/SSI
  - Pain is real but can’t be found by a clinical test
- For the future of pain
  - Work will get more physically demanding over the next decade (home health aides + personal care aides > computer programmers)
  - Maximum BMI is continuing to rise
- For medical care
  - Perhaps the most important issue for biomedical research