

Does Disability Reshape Who We Are?

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Overview: Do Persistent Health Shocks Change Personality?

Data and sample HILDA Survey, 24 waves (2001–2024) $\Rightarrow$ Adults aged 18–64 with at least two observations of the Big Five personality traits

Identification

- Staggered Difference-in-Differences (Callaway & Sant'Anna, 2021)
- Comparison group: not-yet-disabled and never-disabled individuals

We find that disability onset reduces

- Extraversion **0.16SD**, Conscientiousness **0.15SD**, Emotional stability **0.14SD**
- No statistically significant average effects on agreeableness or openness
- Dynamic analysis show effects mostly gradual and larger **2–3 years after onset**
- Heterogeneity: men, younger individuals, and non-graduates more affected
- Social participation & disruption to everyday roles potential pathways (versus health deterioration alone)

Motivation

- Big Five personality traits have been found to predict a wide range of outcomes incl. **schooling, wages, crime, teenage pregnancy and longevity** (Borghans et al., 2008)
- Economics often treats personality as predetermined (Heineck & Anger, 2010; Mueller & Plug 2006, Nyhus & Pons, 2005). Psychologist mostly view change in personality impossible after early adulthood: character “**sets like plaster**” by age 30 (James, 1890, Costa & McCrae, 1994)
- Emerging evidence suggests adult personality can change and we want to know how disability onset may affect the Big Five, how the effect may evolve over time, who is more sensitive to the ‘disability shock’ and the potential pathways

Literature on changes in personality

- People become more socially dominant, conscientious, and emotionally stable across adulthood while social vitality and openness rise early in life and then decline (Roberts et al., 2006)
- Female labour force participation increases self-confidence (Clausen & Gilens, 1990) and self-esteem (Gottschalk, 2005)
- Deliberate psychotherapy interventions produce improvements on personality outcome measures of about 0.85 SD with effects falling to 0.5SD 2 years after treatment ends (Smith, Glass & Miller summarizing 475 controlled studies)
- Big Five mostly stable. Adverse life events produce small intra-individual Big Five changes with the median working-age adult experiencing zero such changes (Cobb-Clark & Schurer, 2012 using Hilda 2006 & 2009). Changes are related to i) employment & income shock, ii) health events and iii) family disruption with effects generally smaller than 0.2SD.

Contributions

1. Prior studies find associations between life events and personality but causal evidence remains limited. We use staggered DiD to shed light on causal estimates (Callaway–Sant’Anna).
2. We examine whether permanent disability causes personality changes which differs from traditional medical diagnosis measures and focus on disability. Disability captures functional limitations, arguably more relevant to many economic outcomes that the personality literature seeks to explain
3. Examine dynamics effects, heterogeneity, and potential mechanisms.

The Big Five Personality Traits / OCEAN

Extraversion

Sociability, enthusiasm, assertiveness, and enjoyment of social interaction.

The degree to which a person... needs attention and social interaction.

Agreeableness

Compassion, trust, cooperation, and concern for others.

... needs pleasant and harmonious relations with others.

Conscientiousness

Organisation, self-discipline, reliability, and persistence in achieving goals.

... is willing to comply with conventional rules, norms, and standards

Emotional Stability

Calmness, resilience, and lower susceptibility to stress and negative emotions.

... (neuroticism) experiences the world as threatening and beyond his/her control

Openness to Experience

Curiosity, creativity, imagination, and willingness to consider new ideas and experiences.

... needs intellectual stimulation, change, and variety.

Why Disability May Affect Personality?

1. Onset of serious health condition may cause distress as the person may need to cope with the emotional, behavioural and cognitive challenges of both diagnosis and treatment, potentially affecting emotional stability
2. Chronic condition induce fatigue and reduced energy for physical, emotional and social activities which can decrease extraversion which entails facets such as excitement seeking, positive moods (see Jokela et al 2014)
3. Inability to organise daily activities and fulfil responsibilities in relation to work, family and personal life may lead to emotional and cognitive challenges best expressed as decreased conscientiousness and openness.

Dimensions of the SF-36 may be useful to understand potential changes in personality

Relevant measures in HILDA

Disability:

1. Long-term condition restricting activities likely to last 6 months or more.
2. Classify sensory, physical and psychosocial disability.
3. We restrict to permanent disability with observed onset (those always living with disability or with fluctuating conditions are excluded)

Other measures

- Big Five questions asked in waves 5,9,13,17 and 21
- Potential pathways based on the six domains of the SF-36 (Mental health, Vitality, Social Functioning, Role Physical, Bodily Pain, General health)

Summary Statistics

Demographic Characteristics	N	Mean	SD	Median	Range
Age	18,778	37.84	12.16	37	18–64
Female	18,778	0.54	0.50	1	0–1
University degree	18,778	0.36	0.48	0	0–1

Disability Characteristics	N	Mean	SD	Median	Range
Ever permanently disabled	18,778	0.10	0.30	0	0–1
Sensory disability	1,947	0.03	0.16	0	0–1
Physical disability	1,947	0.08	0.27	0	0–1
Psychosocial disability	1,947	0.04	0.20	0	0–1

Personality Traits	N	Mean	SD	Median	Range
Extraversion	18,778	4.47	1.08	4.50	1–7
Agreeableness	18,778	5.39	0.89	5.50	1–7
Conscientiousness	18,778	5.17	0.98	5.20	1–7
Emotional stability	18,778	5.20	1.02	5.33	1–7
Openness to experience	18,778	4.17	1.02	4.17	1–7

Econometric Model for the staggered Difference in Difference

Callaway–Sant’Anna Estimator combining each group-level 2x2 DiD $ATT(g, t)$ of onset cohort g and outcome year t :

$$ATT(g, t) = E[\Delta Y | G = g] - E[\Delta Y | C_t]$$

Controls are never-treated and not-yet-treated units.

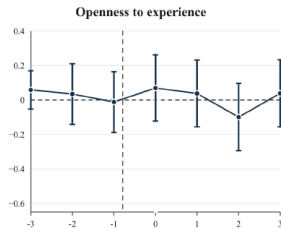
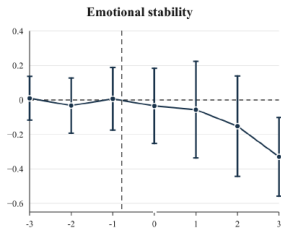
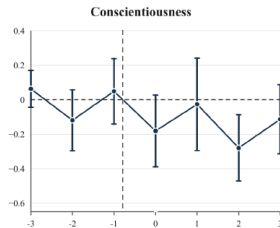
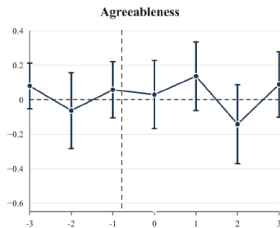
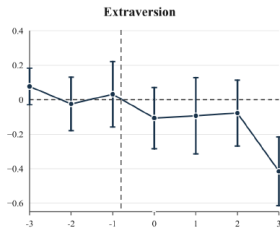
Identification Assumptions

- Conditional parallel trends.
- No anticipation.
- Stable treatment definition.

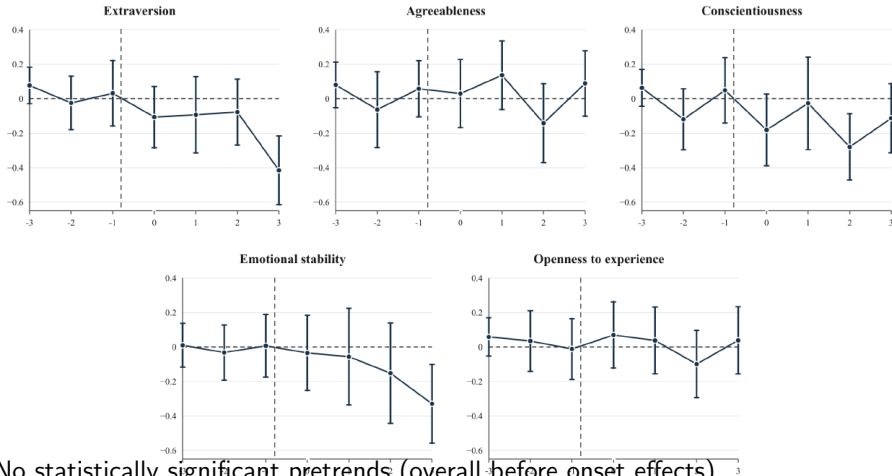
Event-Time Design

- Disability onset observed annually.
- Personality observed every four years.
- Estimates aggregated across cohorts and event times.

Event Study

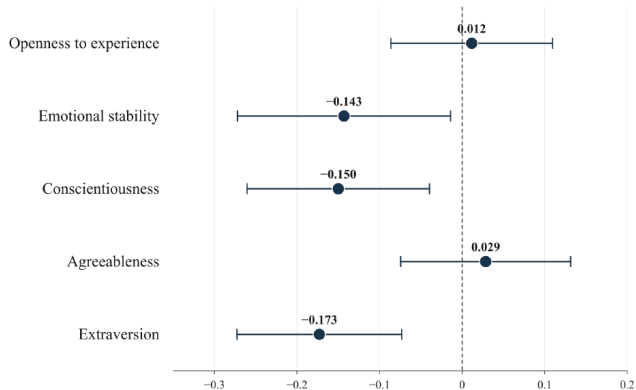


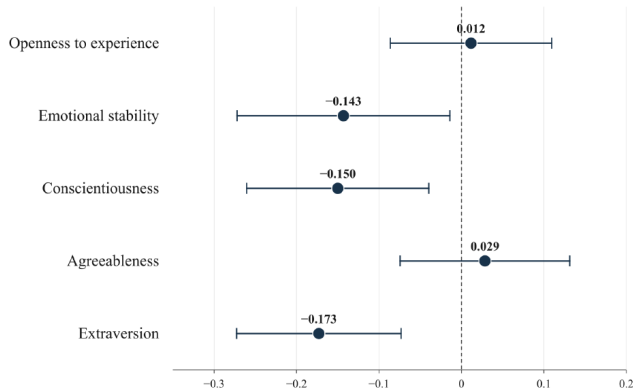
Event Study



- No statistically significant pretrends (overall before onset effects)
- Effect vary over time, generally larger over time

Pooled Results

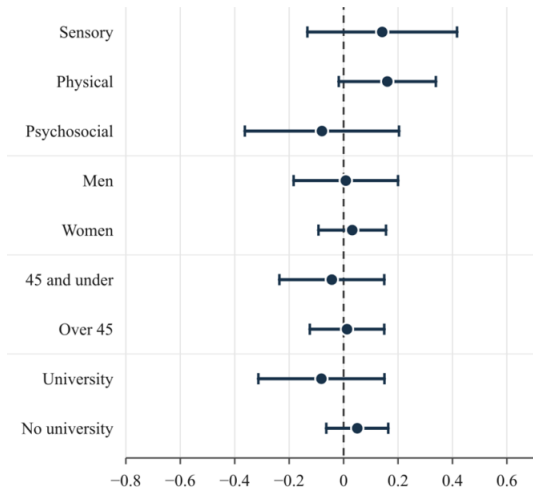




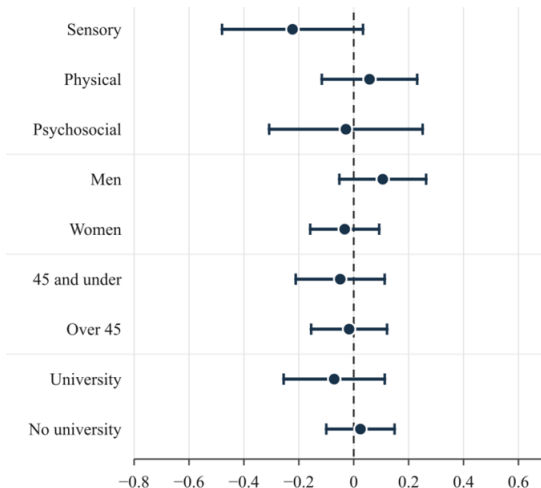
- Multiple hypothesis testing : similar conclusions
- Similar conclusions with alternative estimators (Wooldridge TWFE, BJS) and the (bad) TWFE.

Heterogeneity 1/2

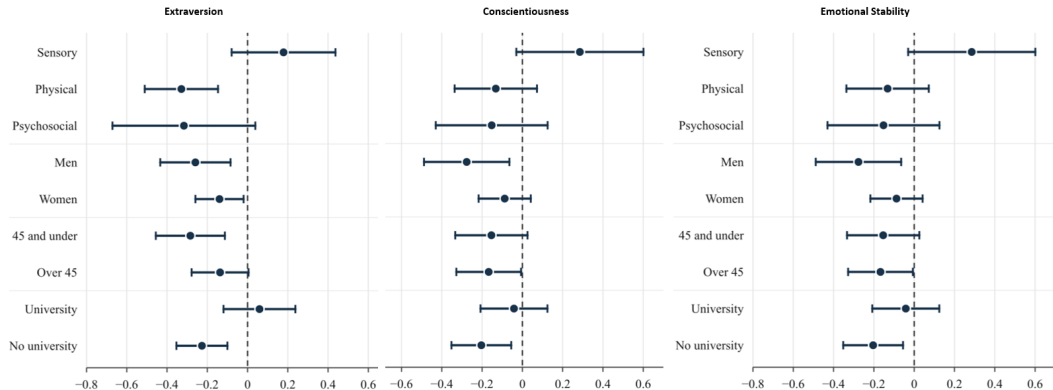
Agreeableness



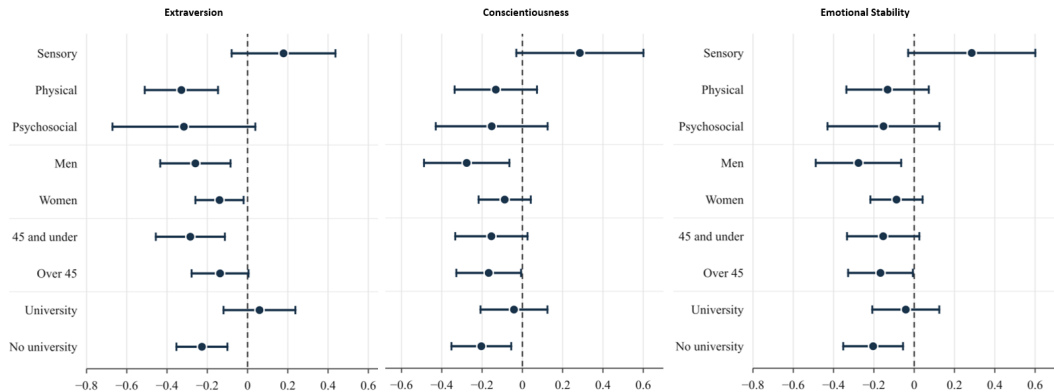
Openness to experience



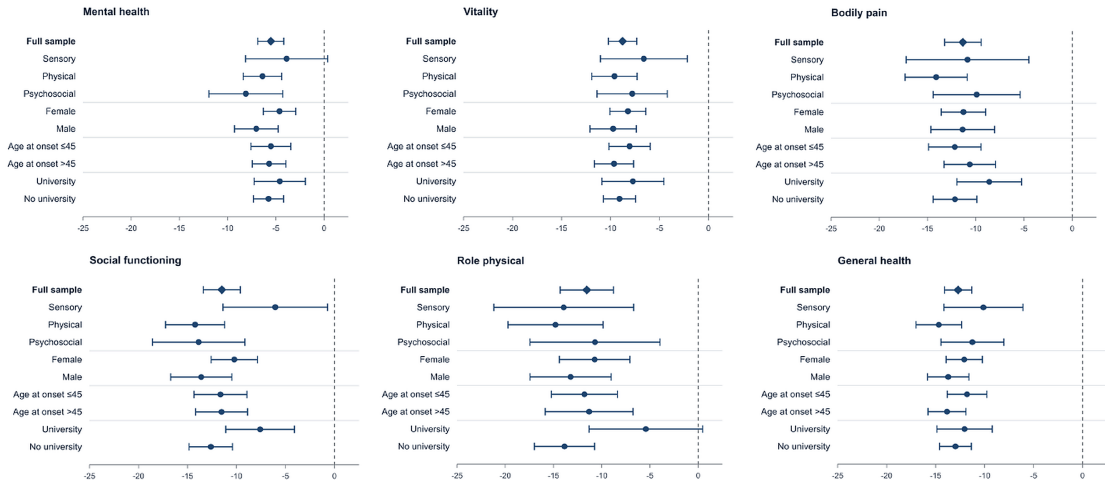
Heterogeneity 2/2



Heterogeneity 2/2



- Larger effects for men and those with no university degree (and young people for extraversion).



- Deterioration in health & functioning does not equate changes in personality (eg. graduates)
- Declines in social functioning and ability to perform work and daily roles (role physical) align with personality (eg. men and non graduates)

Conclusion

Summary

1. Disability has a dynamic negative impact on extraversion, conscientiousness and emotional stability.
2. Except for extraversion, results broadly similar to intensive exposure to adverse health shock in Cobb-Clark & Schurer
3. Role disruption and reduced participation may be important pathways.

Takeaways

1. Overall, personality change may represent an additional pathway through which disability contributes to subsequent socioeconomic disadvantage
2. This response is not evenly distributed with men, younger-onset individuals and those without a university degree more affected
3. Research using personality measures as control may want to avoid using (post) onset personality measures

Borghans & al. 2008: Facets and Markers for the Big Five

Factor	Facets	Definition of Factor	ACL ^a Marker Items for Factor
I. Openness to Experience (Intellect)	Fantasy, Aesthetics, Feelings, Actions, Ideas, Values	The degree to which a person needs intellectual stimulation, change, and variety.	Commonplace, Narrow-interest, Simple- vs. Wide-interest, Imaginative, Intelligent
II. Conscientiousness	Competence, Order, Dutifulness, Achievement striving, Self-discipline, Deliberation	The degree to which a person is willing to comply with conventional rules, norms, and standards.	Careless, Disorderly, Frivolous vs. Organized, Thorough, Precise
III. Extraversion	Warmth, Gregariousness, Assertiveness, Activity, Excitement seeking, Positive emotions	The degree to which a person needs attention and social interaction.	Quiet, Reserved, Shy vs. Talkative, Assertive, Active
IV. Agreeableness	Trust, Straight-forwardness, Altruism, Compliance, Modesty, Tender-mindedness	The degree to which a person needs pleasant and harmonious relations with others.	Fault-finding, Cold, Unfriendly vs. Sympathetic, Kind, Friendly
V. Neuroticism (Emotional Stability)	Anxiety, Angry hostility, Depression, Self-consciousness, Impulsiveness, Vulnerability	The degree to which a person experiences the world as threatening and beyond his/her control.	Tense, Anxious, Nervous vs. Stable, Calm, Contented

Source: Costa and McCrae (1992b) and Hogan and Hogan (2007).

Note: a. ACL = Adjective Check List (Gough and Heilbrun 1983).

Summary Statistics: SF-36 Health Dimensions

	N	Mean	SD	Median	Range
Physical functioning	18,586	93.60	14.39	100	5–100
Mental health	18,709	76.58	14.78	80	4–100
Vitality	18,682	63.99	17.35	65	5–100
Bodily pain	18,644	83.07	17.43	84	10–100
Social functioning	18,731	89.70	17.04	100	12.5–100
Role physical	18,027	95.79	14.12	100	25–100
General health	18,643	76.60	15.93	77	5–100

Questions?

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