LIFE COURSE, G-E INTERACTION AND SOCIOLOGICAL IMAGINATION

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SOCIOLOGICAL IMAGINATION –

the proactive exploration of the ways in which social forces shape human experience and regulate individual lives

1. *Squelching Imagination: A Historical View*

2. *G-E Interactions in Contemporary Life Course Research*

3. *Social organization of Gene-related factors*

Traditional approach -- *The organismic paradigm in psychology* –

- "Normal aging"
- aging as a universal, individual – level process
- aging as a transhistorical, transcultural process
- Disengagement theory

Combined with – *Structural-functionalism in sociology* –

- Consensus/Harmony
- Homogeneity of values and interests
- Strong assumption of legitimacy
- Organismic model applied to society

Symbiotic co-dependence

SOCIOLOGY -
STRUCTURAL-FUNCTIONAL
PARADIGM

PSYCHOLOGY –
ORGANISMIC-MATURATIONAL
PARADIGM

Normal aging paradigm

Social paradigm

including …

Cohort analysis

Ryder, 1965

Riley, Johnson & Foner ,1972

Life course perspective

Clausen, 1972

Elder, 1974, 1975

Alternative approaches

Interactionism (Bengtson, 1973)

Constructivism (Gubrium, 1976)

Critical/political economy (Phillipson, 1982)

*A **serious challenge** to "normal aging"*

Social paradigm approaches were

1) *radicalizing* – in forcing a revision of "normal aging" assumptions

and almost simultaneously

2) *limiting* – in the preoccupation with social change as a privileged form of influence in the neglect of the structured social processes

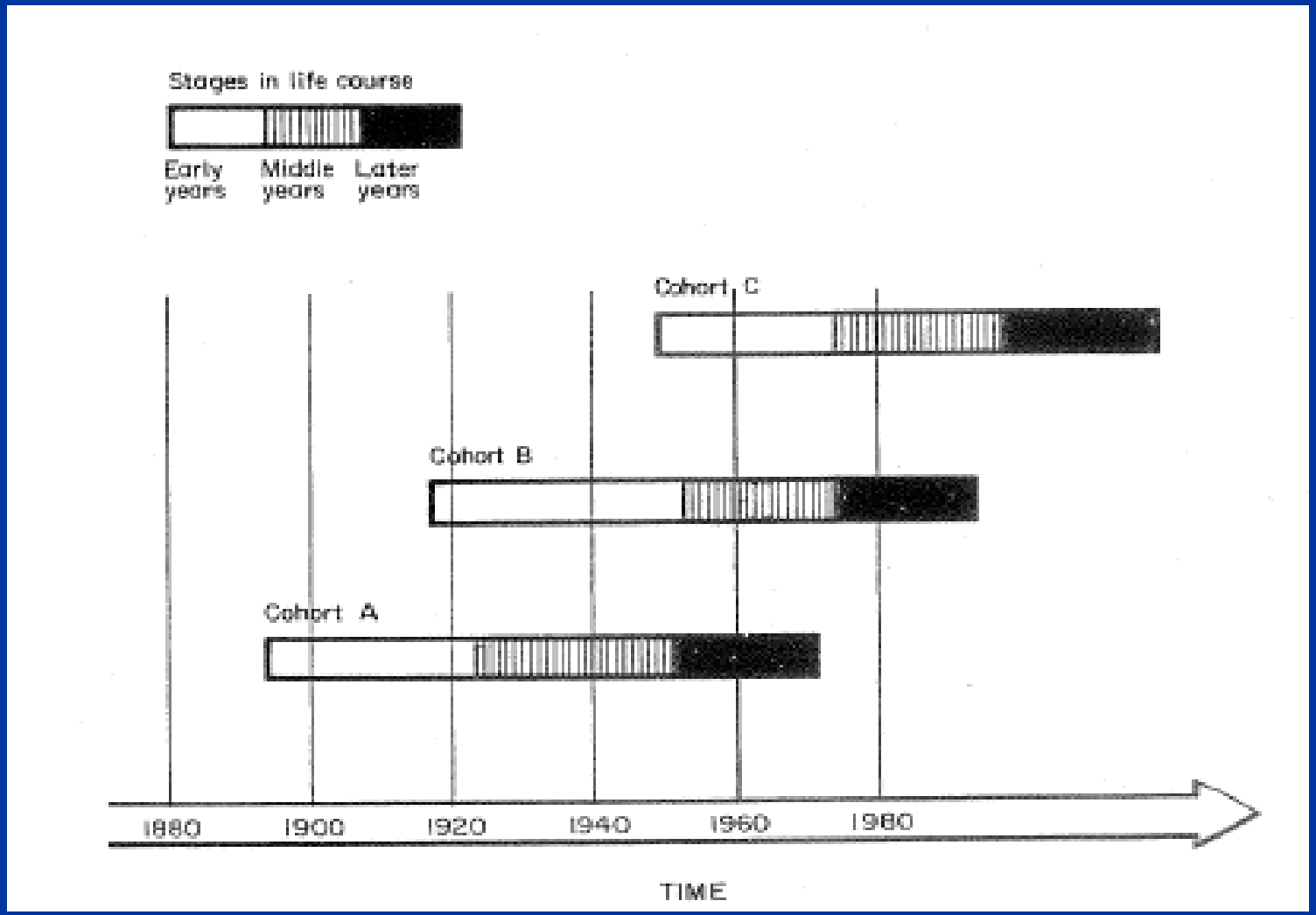


Figure 1. "Processes of Cohort Formation and Aging Showing Selected Cohorts over Time." From Riley, Johnson & Foner, 1972.

Containing the force of the social –
by equating social forces and social change :

But -- what if *there were no change?*

Of course, the constitutive force of social processes ***would be just the same.***

(Dannefer & Uhlenberg, 1999)

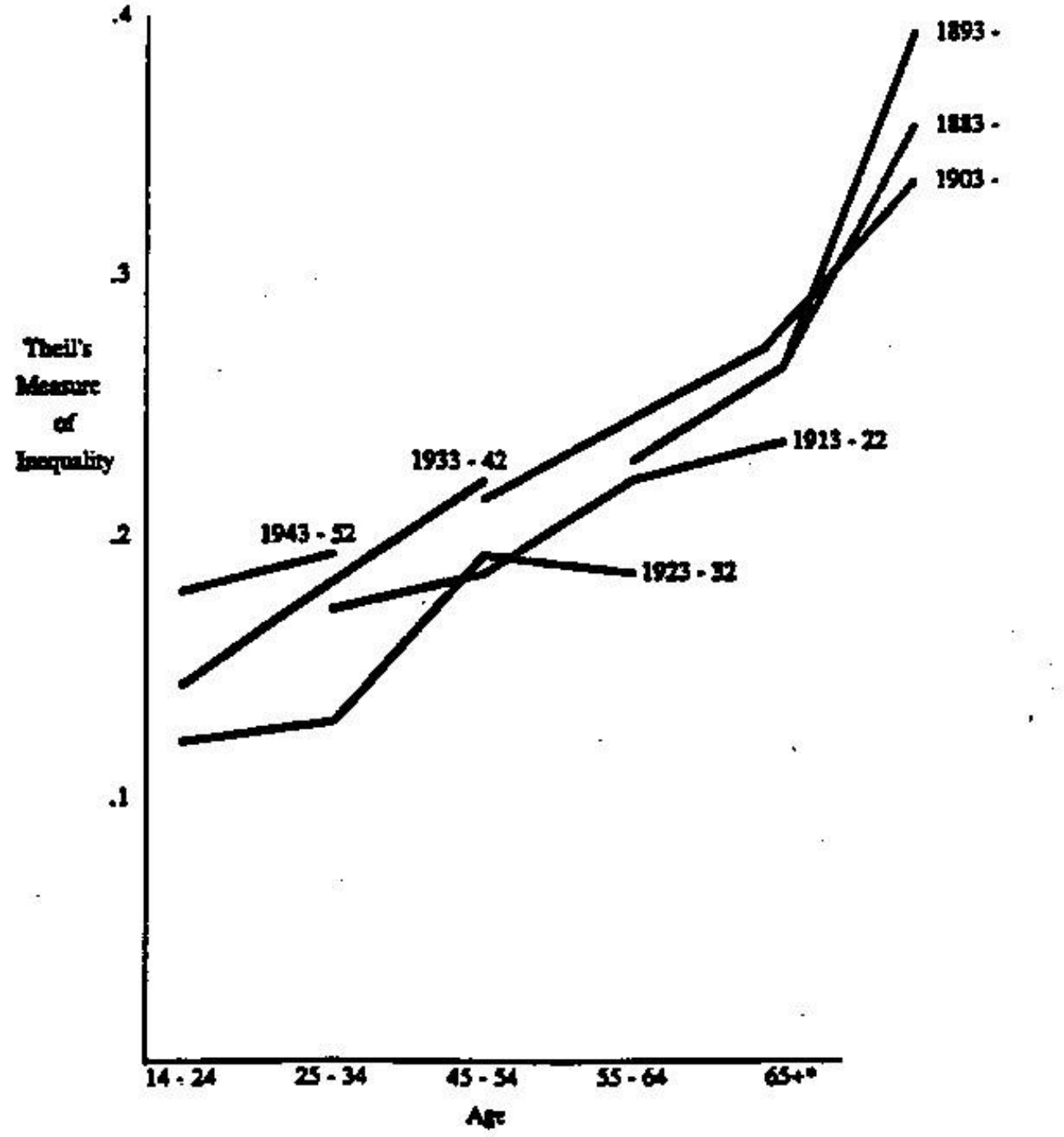


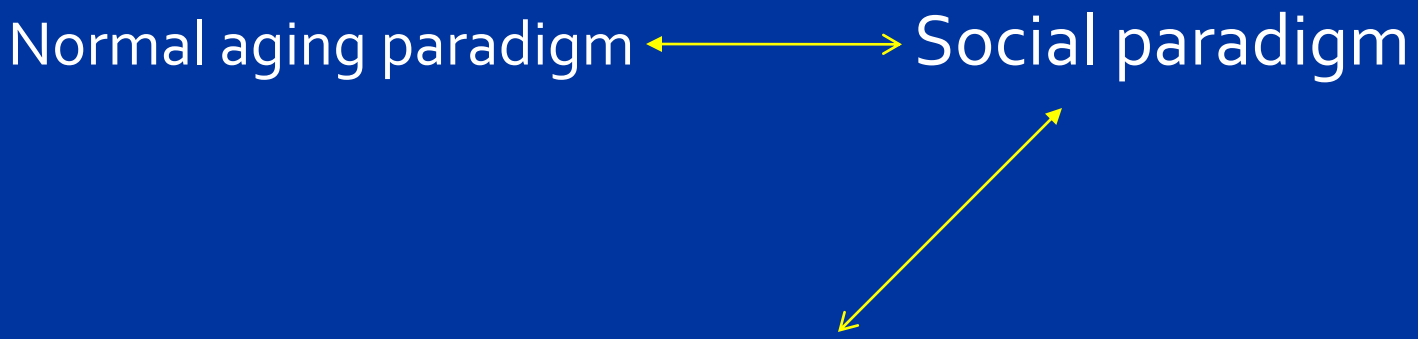
Figure 2. Cumulative Dis/Advantage over the Life Course:

Theil's measure of inequality for families by age of head in seven birth cohorts.

(Observation periods 1947, 1957, 1967, 1977)

(Dannefer & Sell, 1988)

[adapted from Treas, n.d.]



Containment --

allowing for, but limiting, the scope of expected social effects on aging

II. The Heuristic of Containment and Gene-Environment Interactions

G-E interactions and ***social control***

-- social conditions constrain individual action and will thus regulate the extent to which genetic variation can express itself.

-- has been applied to:

- Sexual activity
- School achievement and cognitive performance
- Smoking
- Obesity risk
- Other characteristics

Cohort differences in smoking behavior are attributable to different levels of control in the macro-environment –

less general sanctioning of smoking,

more genetic influence on behavior

(based on Boardman, Blalock & Pampel, 2010)

"… genetic associations are most clearly observable in *benign* environments that lack social factors encouraging genetically influenced addictive behaviors. When social noise is minimized, it allows for 'biology to shine through' (Raine 2002:14)…"

Boardman, Blalock & Pampel, 2010:110

Under “benign” environmental conditions,

“ … the rise in smoking is primarily among those with genetic predispositions”

(Boardman et al., 2010:111)

… genes are not all that can "shine through" -- a host of other social factors are candidates as well.

In every human environment, social processes are causally operative at multiple system levels, from microinteraction to culture.

When twin studies report MZ-DZ differences that support the hypothesis of G-E interaction, can we consider a genetic effect established?

NO - **(EVEN IF WE IGNORE THE COMPELLING CRITIQUES OF TWIN STUDIES AND ACCEPT THEIR METHODS AND DATA)**

For reasons including:

1. *THE SOCIAL ORGANIZATION OF GENETIC DIFFERENCES*

2. *THE SOCIAL ORGANIZATION OF GENETIC EXPRESSION -- EPIGENETICS*

III-A. THE SOCIAL ORGANIZATION OF GENETIC *DIFFERENCES*

Genetic characteristics are used for purposes of making social discriminations in ways that have nothing to do with genetically transmitted abilities, and much to do with human history, economics, politics and culture.

"… if red-haired children were discriminated against in school and if, as a result of that discrimination, performed worse on cognitive tests, one might conclude in a study that genes associated with red hair had caused low performance. It would in a sense be correct, but not because the genes were a direct cause of IQ… The genes caused hair color, the hair color "caused" the discrimination, and the discrimination, not the genes, was the culprit."

(Marmot, 2004: 55, drawing on Jencks' work)

III-B. The SOCIAL ORGANIZATION of GENETIC *EXPRESSION*

Epigenetics

"…. the branch of biology that deals with the effects of external influences on gene expression."

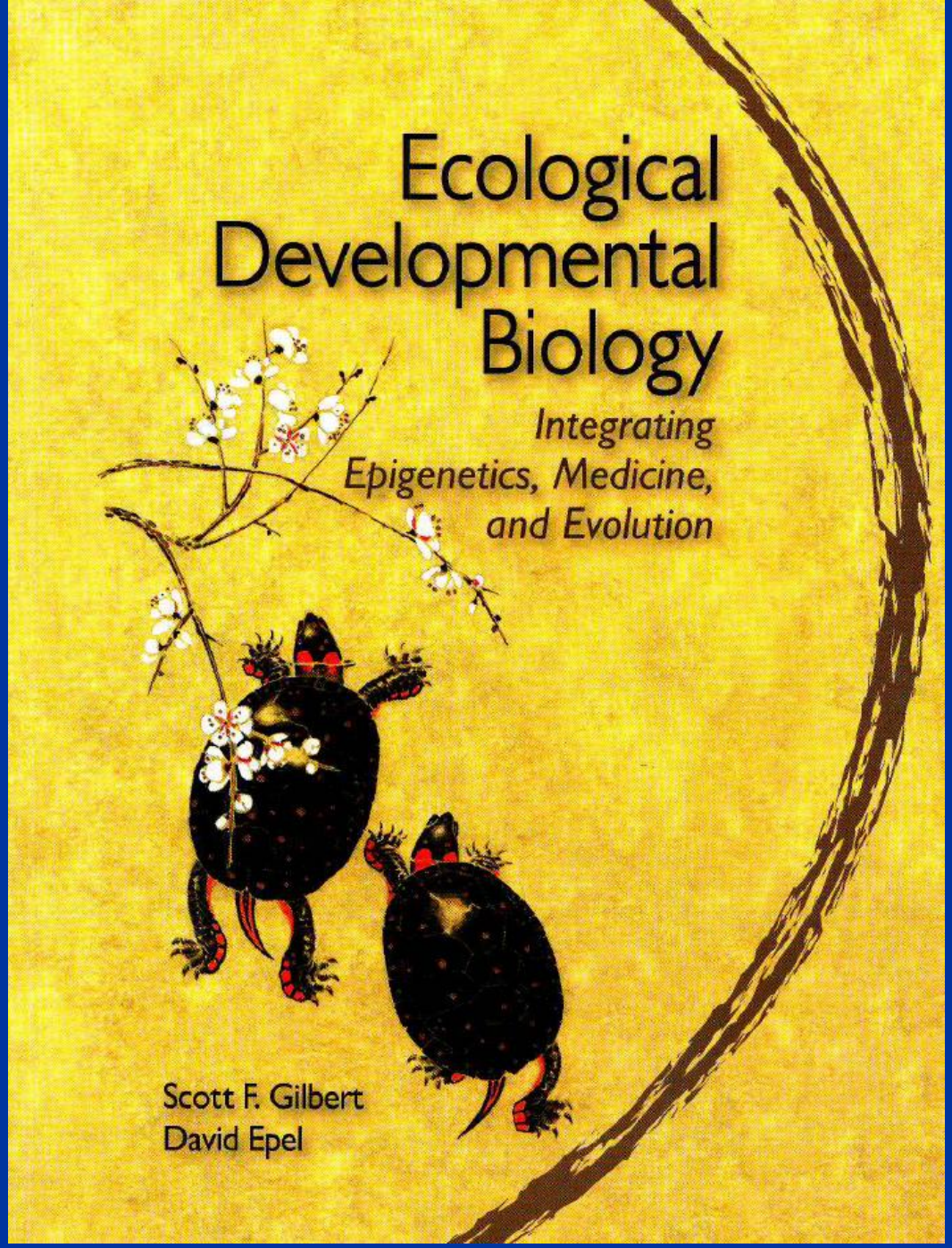
(Gluckman & Hanson, 2006:66)

ADULT FORMS OF THE *DESERT LOCUST*

Polyphenism

-- the potential to develop substantially different phenotypes from a single genotype, based on differing environmental conditions

Gilbert & Epel, 2009



or "Eco-Devo" Biology ...

"…we must discard the notion that the genome is like a perfect blueprint which lays down a set of instructions …. the mature phenotype … (is) the outcomes of a cascade of interactions between … environment and …organism which in turn depend on past interactions – at every stage … determined by the nature of the environment, …particularities of the genome, and the previous interactions between the environment and the genome."

Gluckman & Hanson, 2006:75

'Thought-provoking . . . an important idea'
Nature

Mismatch

The Lifestyle Diseases Timebomb

Peter Gluckman & Mark Hanson
Foreword by Robert Winston

PREDICTIVE ADAPTIVE RESPONSE

-- Epigenetic control

environmental regulation of gene expression

-- Setting the phenotype

habituation of hormonal and metabolic responses

early in the life course ("adaptive prediction")

-- "Match" (or mismatch)

between childhood "predictions" and adult

circumstances and practices

Gluckman & Hanson, 2006

F

- “Social Regulation of Gene Expression in Human Leukocytes”
  *Genome Biology 13,*8:R189. (2007)

- “DNA microarray analysis identified 209 genes that were differentially expressed in circulating leukocytes from 14 high- versus low-lonely individuals, including up-regulation of genes involved in immune activation, transcription control, and cell proliferation, and down-regulation of genes supporting mature B lymphocyte function.”

- “These data provide the first evidence that social-environmental risk factors are linked to global alterations in human gene transcription, and they establish a molecular context for understanding the increased risk of inflammatory disease observed in human beings who experience a chronic sense of subjective social isolation (loneliness).”

Cole, Hawkley, Aravelo, Sung, Rose & Cacciopo, 2007

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