Staying on Track

A Voyage to the Internal Mechanisms of Routine Persistence

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(WORK IN PROGRESS)

Project Antecedents

- Learning: Routines have been coded/imprinted by experience.
- Routines are kind of (less formal & obligatory) cousins of rules.
- Markus Becker
  - ★ Yeah, cool!
  - ★ EEK! The field of routines is *unwieldy!!!*
  - ★ -> "My Messy Science Project"
  - ★ -> Effort to make sense of some parts of the field (from a sociological OT perspective)
- The "Problem of Order"
  - ★ Anarchy and Entropy
    - ◎ How can routines persist?
  - ★ Evolution
    - ◎ Capture and predict organizational change as produced by some kind of natural evolution of routines.

Outline

- **Importance of Routines in Theories**
- **Routine Sameness**
- **How do We Recognize Routines?**
- **What Keeps Routines on Track?**
- **Path Dependence**
- **Mechanisms of Path Selection**
- **Mechanisms and Persistence**
- **Discussion & Conclusion**

Routines as Key Ingredients of Theories of Social and Economic Order

- ● **Routines as**
  - ★ **BUILDING BLOCKS of organizations (and societies)**
    - ◎ **Levitt & March's notion of organizational learning**
  - ★ **GENES of organizations**
    - ◎ **Nelson & Winter's evolutionary theory of economic change**
  - ★ **GRAMMARS of organizational action**
    - ◎ **Pentland's work on tech support routines**
  - ★ **SOURCES of Competitive Advantage**
    - ◎ **Teece et al. dynamic capabilities**
- ● **Are Routines primary phenomena?**
  - ★ **Or just epiphenomena?**
- ● **If yes, How do Routines Persist?**
  - ★ **How do they persist autonomously?**

Routine Sameness

- How do we know it is the 'same' routine?
  - ★ Recurrence presupposes routine identity.
- Is every instantiation of a routine identical to the last one?
- Let's look at a few examples!

WAKE UP.

SHOWER.

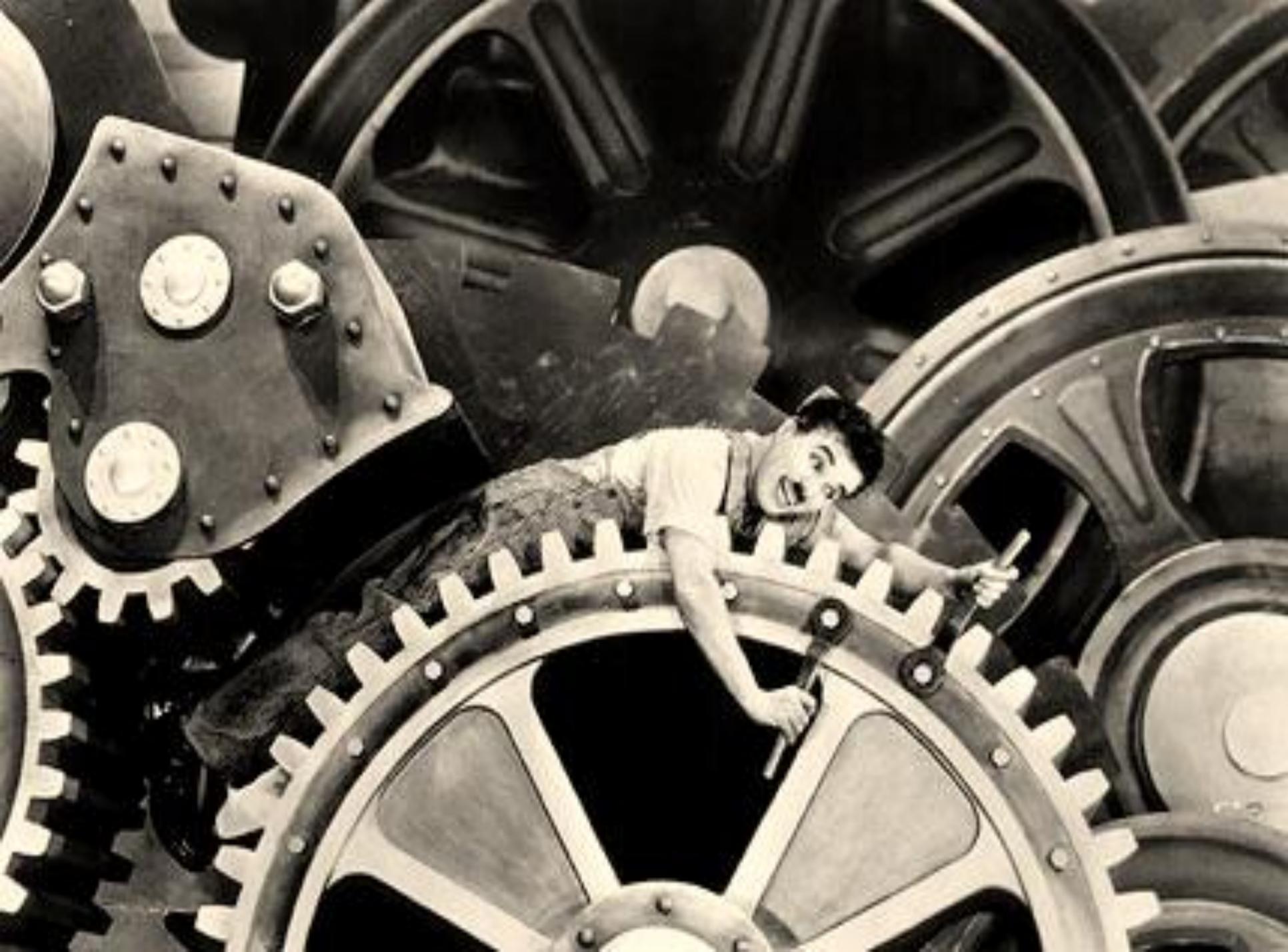DRESS.

EAT.

ACKNOWLEDGE WIFE.

ACKNOWLEDGE BOSS.

AND SIT.

AND

STAND MY

Tati's Image of 'Organization'

Concrete Formwork

Carepath

Post Kidney-Pancreas and Pancreas Alone Transplant Care Path

Activity	D/C	Month 1				Month 2				Month 3				Month 4-5				Month 6				Month 7				Month 8-9				Month 10-11				Month 12			
		Week 1	Week 2	Week 3	Week 4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Prevent Adverse Events		M T W T F	M T W T F	M T W T F	M T W T F																																
Clinic appt with lab		x	x	x	x	x	x	x	x		x		x		x		x		x		x		x		x		x							x			
Lab only		x	x	x	x		x		x	x		x		x		x			x		x																
Home Monitoring		x	x	x	x		x		x	x		x		x		x			x		x																
Evaluation														x																				x			
Transplant Class			x			x			x			x		x				x				x				x				x				x			
Biopsy (Pancreas Alone only)*		x			x	x			x																												
IV GTT (to be determined)														x																				x			
Individual Instruction	x	x			x		x						x																					x			
Transplant Newsletter	x				x		x			x			x			x			x			x			x			x								x
Facilitate Employment																																					
History/Assessment					x																															
Goals and Strategies													x																							
Enhance Social Support																																					
Peer Mentor (matched while in hospital)																																					
Support Group					x	x		x		x		x		x		x		x		x		x		x				x					
Social Network Map					x											x																x			
						MD review				MD review				MD review																				MD review			

* The care path for the KP and PA are identical except that PA receive biopsies posttransplant on day 14; weeks 4, 8 and 12.

Workout Routines

A Hip Replacement Routine!

Remove Head

Enlarge femoral cavity

Insert Gauge
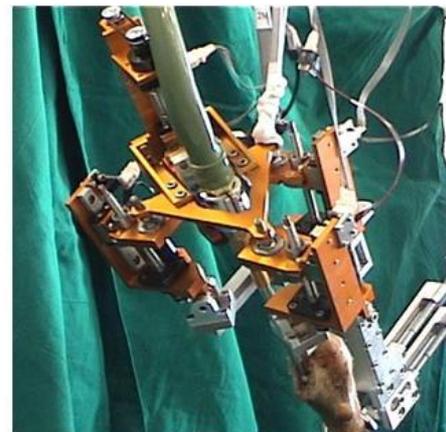
Attach Frame

Measure Difference

Remove Gauge

Mount Robot Machine Femur

Insert Implant

A Fortran Sub-Routine!

```
C                                                              ESM11390
        SUBROUTINE SHELK(N,X,KX)                               ESM11400
C                                                              ESM11410
C                                                              ESM11420
        INTEGER*4 N,KX                                         ESM11430
        DIMENSION X(N),KX(N)                                   ESM11440
        DO 10 J=1,N                                            ESM11450
10      KX(J)=J                                                ESM11460
        I=1                                                    ESM11470
20      I=I+I                                                  ESM11480
        IF(I.LE.N)GOTO 20                                      ESM11490
        M=I-1                                                  ESM11500
 30     M=M/2                                                  ESM11510
        IF(M.EQ.0)GOTO 70                                      ESM11520
        K=N-M                                                  ESM11530
        DO 60 J=1,K                                            ESM11540
        JM=J+M                                                 ESM11550
 40     JM=JM-M                                                ESM11560
        IF(JM.LE.0)GOTO 60                                     ESM11570
 50     L=JM+M                                                 ESM11580
        IF(X(L).GE.X(JM))GOTO 60                               ESM11590
        PIV=X(JM)                                              ESM11600
        X(JM)=X(L)                                             ESM11610
        X(L)=PIV                                               ESM11620
        KPIV=KX(JM)                                            ESM11630
        KX(JM)=KX(L)                                           ESM11640
        KX(L)=KPIV                                             ESM11650
        GOTO 40                                                ESM11660
60      CONTINUE                                               ESM11670
        GOTO 30                                                ESM11680
70      CONTINUE                                               ESM11690
        RETURN                                                 ESM11700
        END                                                    ESM11710
C                                                              ESM11720
C     *ENDP-------------------------------------               ESM11730
C                                                              ESM11740
```

A Makeup Routine!

A Ballet Routine!

A Legislative Routine! (Taiwan)

Oops! Sometimes Routines Break!

Sameness -- Observations

- There is sameness.
  - ★ Sometimes ridiculous levels of sameness
- But often there are also variations.
- And sometimes routines break!
- And sometimes routines blend into other routines.
- And sometimes beginning and end of a routine are not clear.

- ⇒ **How do we recognize routines?**

We Recognize Routines Because..

- They *repeat.*
- We recognize them as patterns.
  - ★ **Pattern recognition of *repeats***
- Because they repeat, we re-cognize routines as units.
- We re-cognize routines as 'objective' and 'exterior' phenomena (Berger & Luckman, Zucker).

Staying on Track

- So, we can recognize routines.
  - ★ .. because they usually repeat.
- Okay, but what makes them *repeat the same* set of steps?
- How do routines stay on track?
  - ★ What assures faithfulness?
    - ◎ Overcoming entropy & anarchy
    - ◎ Exceptions & Emergencies & Opportunities
    - ◎ Adaptability
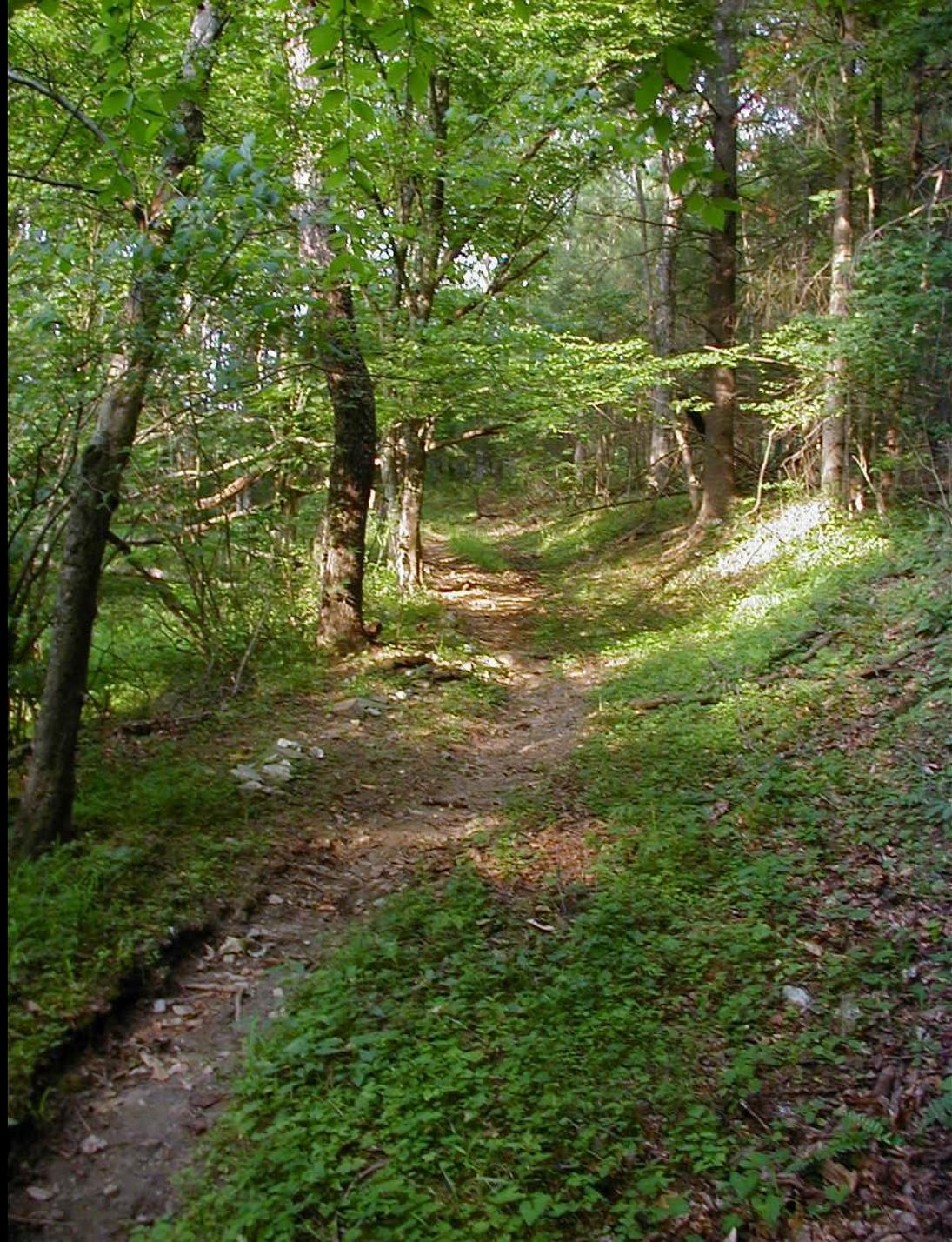
What Keeps Routines On Track?

- **<u>Internal</u> vs External Forces**
  - ★ **Internal forces ⇨ "Eigendynamic"**
- **Path Dependence**
  - ★ How routines come to be guided by their own past, by prior executions of the task, by cumulated experiences, by their history.

Path Dependence

Internal Mechanisms of Path Selection

- Routines are kept on track mechanisms that *select* consecutive steps.

- Prior actions *select* subsequent actions.
  - ★ "Anschlußhandeln" und "Anschlußfähigkeit" (Luhmann)
  - ★ Interdependencies between subroutines
  - ★ Prior executions of the routine provide guidance

- What mechanisms are there?

Priming

- "Priming refers to a change in the speed, bias or accuracy of the processing of a stimulus, following prior experience with the same, or a related, stimulus." (Henson, 2003)

- On the level of the individual actor.

- Mechanism of Selection:

  ★ *Attention spreading to primed memory locations.*

  ★ Prior experience with the same situation *remind* the actor about which next steps are customary, appropriate, or useful.

Activated area in brain primed by prior executions of the routine
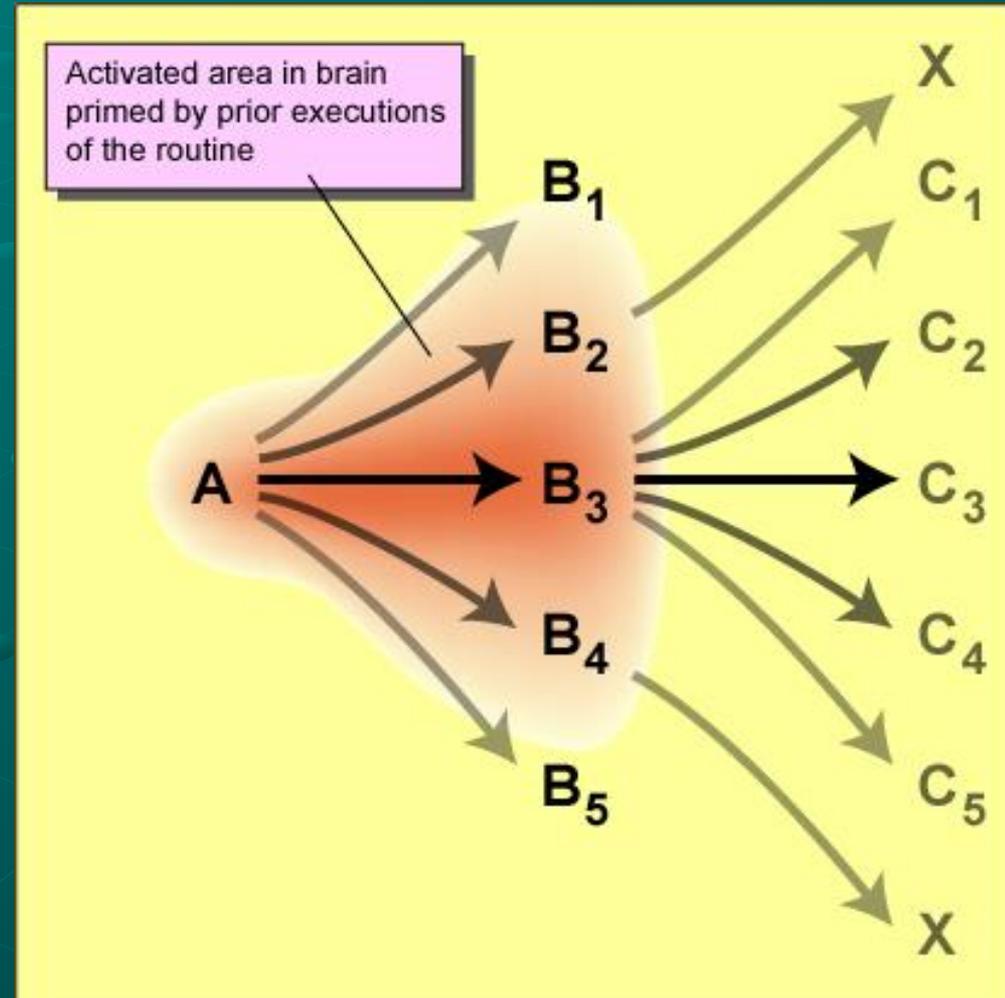
Habituation

- Building a canoe from matchsticks
- *"There I go again!"*
- Re-cognizing it as a separate entity
  - ★ An "ipso facto pattern" (Berger and Luckman).
- Selection Mechanism:
  - ★ *Engagement in actions that 'belong' to that pattern.*
  - ★ *Familiarity*
    - ◎ We 'know' if something belongs or does not belong to the pattern.
- Kept on track by a mental image / "script" (Schenk and Abelson)
- "Knowledge of the job" (Nelson and Winter)
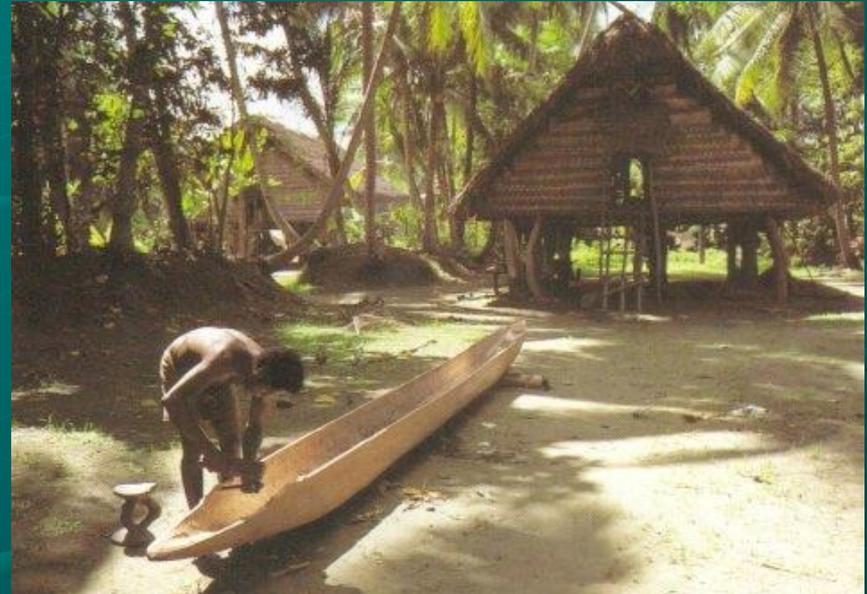
Reciprocal Typification

- Friday recognizes Robinson's routines.

- *"Aha, here he goes again!"*

- Selection Mechanism:
  - ★ *Perceptions about the expectations and potential reactions of others*
    - ◎ *"Doppelte Kontingenz"* (Luhmann)

- Source of expectations:
  - ★ Joint history

- Departure: *"Hey what ya doin'?"*

  - ★ Critical condition: Reliable communication of disapproval

Institutionalization

- Selection Mechanism:
  - *Widely accepted and usually taken for granted conceptions of what the next step 'ought' to be*
- Usually starts when routines are passed down to new generations
  - "*Historical and objective facticity*"
- Limitation
  - Relies on shared social history/context

Formalization

- Routines are often encoded into rules.
- Selection mechanism:
  - *Actions comply with the rules.*
- Limitations
  - Actors often circumvent rules.
  - Rules are sometimes poorly constructed and incomplete.
  - Rules can be rigid.
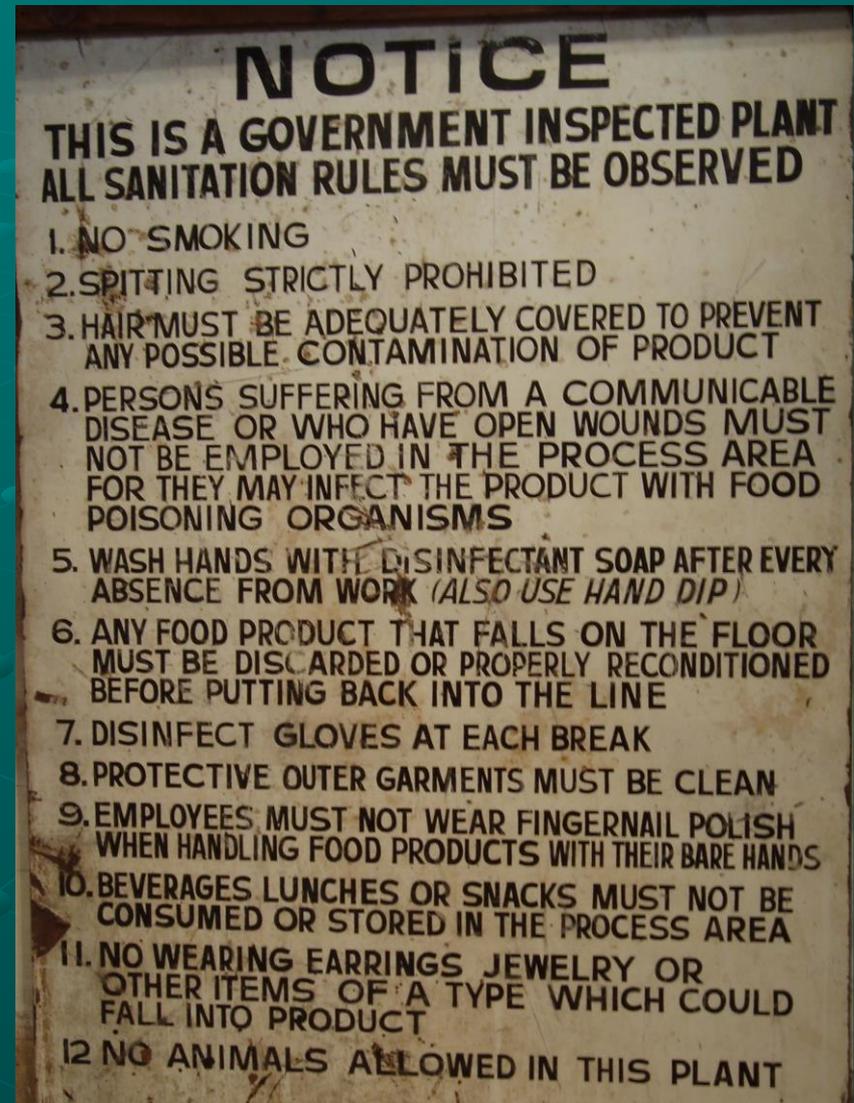
Artifacts

- Routine work often establishes artifacts that guide routine use.
- Selection Mechanism:
  - *Enabling / Constraining/ Signaling*
- Special sub-cases:
  - Technology
  - Tools

Concatenation of Procedural Memory

- Routines are stored in procedural memory (Cohen and Bacdayan)

- "The routine of a group can be viewed as the concatenation of .. procedurally stored actions, each *primed* by and *priming* the actions of others." (Cohen and Bacdayan, 1994: 557)

- Selection mechanism:
  - ★ *Reciprocal triggering*
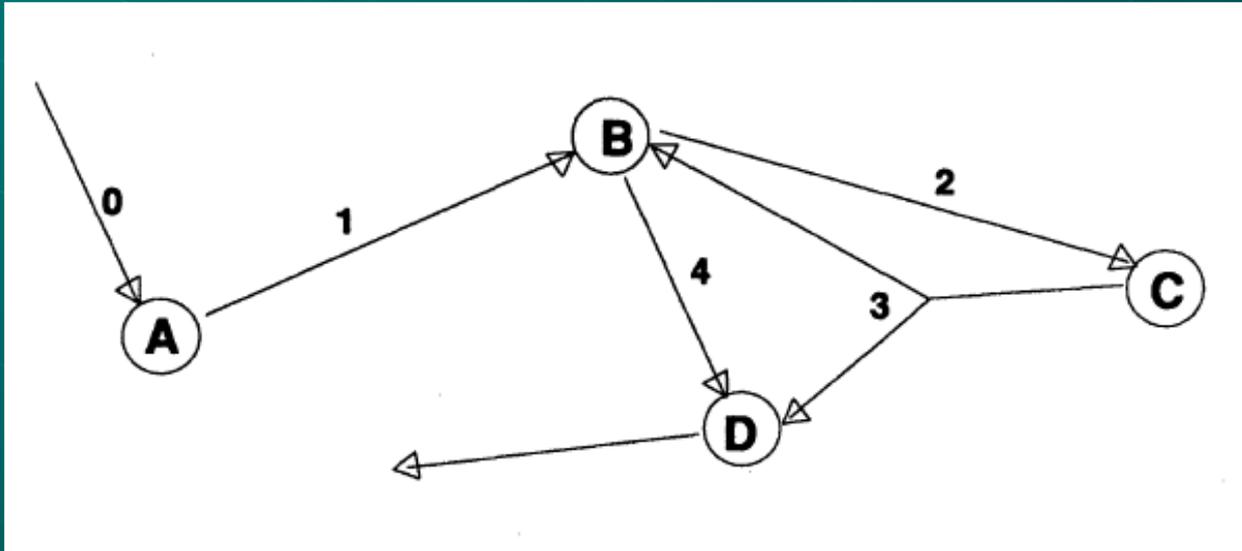
Calculation

- **Awareness of how individual actions taken within a routine contribute to the outcomes**
- ***"Routines as targets"*** (Nelson and Winter)
- **Selection Mechanism:**
  - ★ ***Awareness of action-outcome relationships***
- **Limiting Cases:**
  - ★ **Meticulous performance of a drill**
  - ★ **Painstaking adherence to a superstitious ritual**
  - ★ **Weberian rationality**

Competency Traps

- Competencies developed with a *part* of a routine make it more rewarding to re-use that action than using alternatives.
- Selection Mechanism:
  - ★ *Consideration of how returns from competent action contribute to the outcomes of the routine.*
- Choice based on poorly formed estimates of potential returns from alternatives
  - ★ Special case of calculation
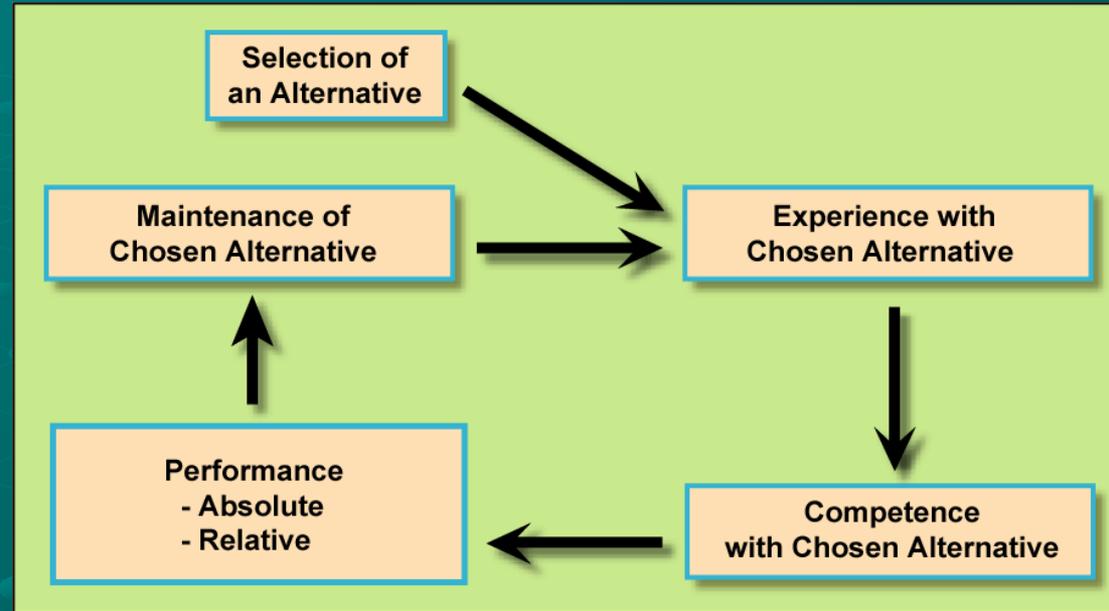
Escalation of Commitment

- *"Throwing good money after bad"*
- *"Need to try harder"*
- *Wishful thinking*
  - ★ *Intensity of beliefs ➔ belief comes true*
- Selection Mechanism:
  - ★ *Actors take actions that re-affirm and extend prior beliefs.*
- Limitation: Usually based on a fallacy.
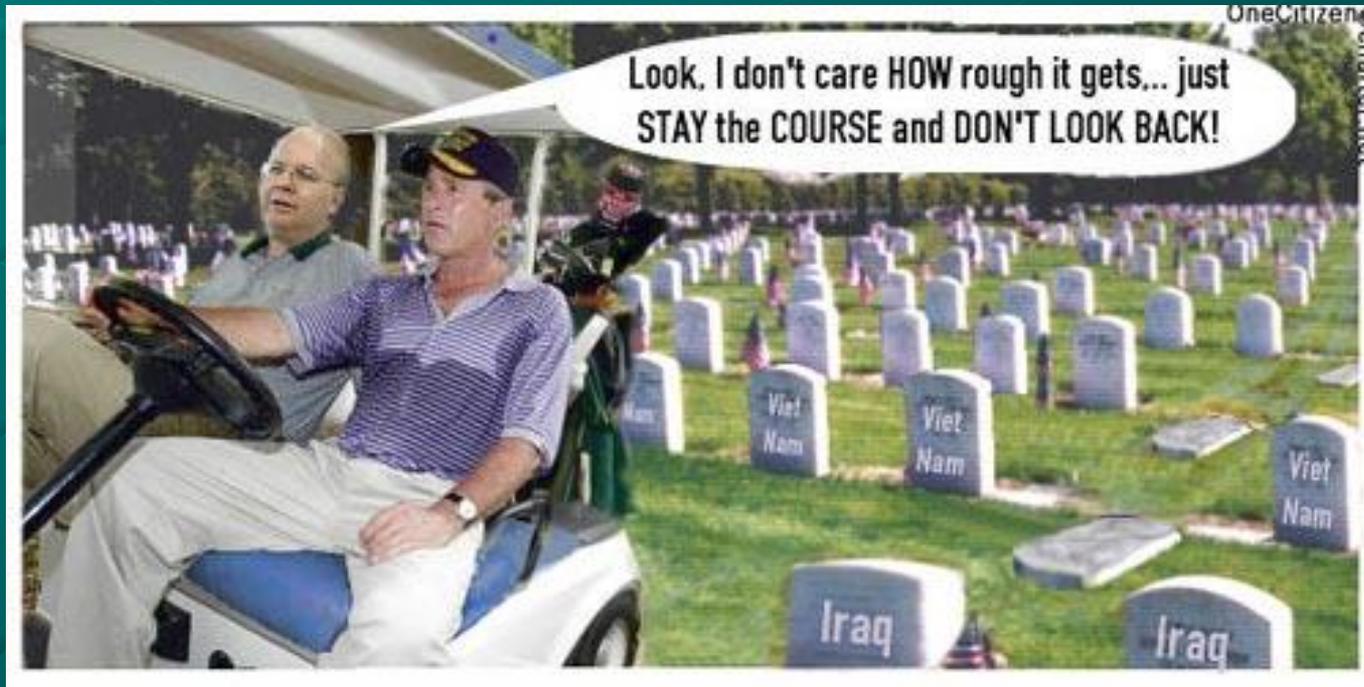
Coercion/Fiat

- **Involves consideration of sanctions.**
  - ★ **Special case of calculation**
- **Mechanism of Selection:**
  - ★ *Avoidance of pain*
- **Limited efficiency**
  - ★ **Requires monitoring and enforcement procedures**
  - ★ **Requires clear instructions, plans, micromanagement**
  - ★ **Corruptible**

Leadership

- **Involves voluntary submission to leader and his/her orders.**
- **Mechanism of Selection:**
  - ★ *Obedience*
- **Limitation:**
  - ★ **Requires that the leader has a plan and succeeds implementing it.**
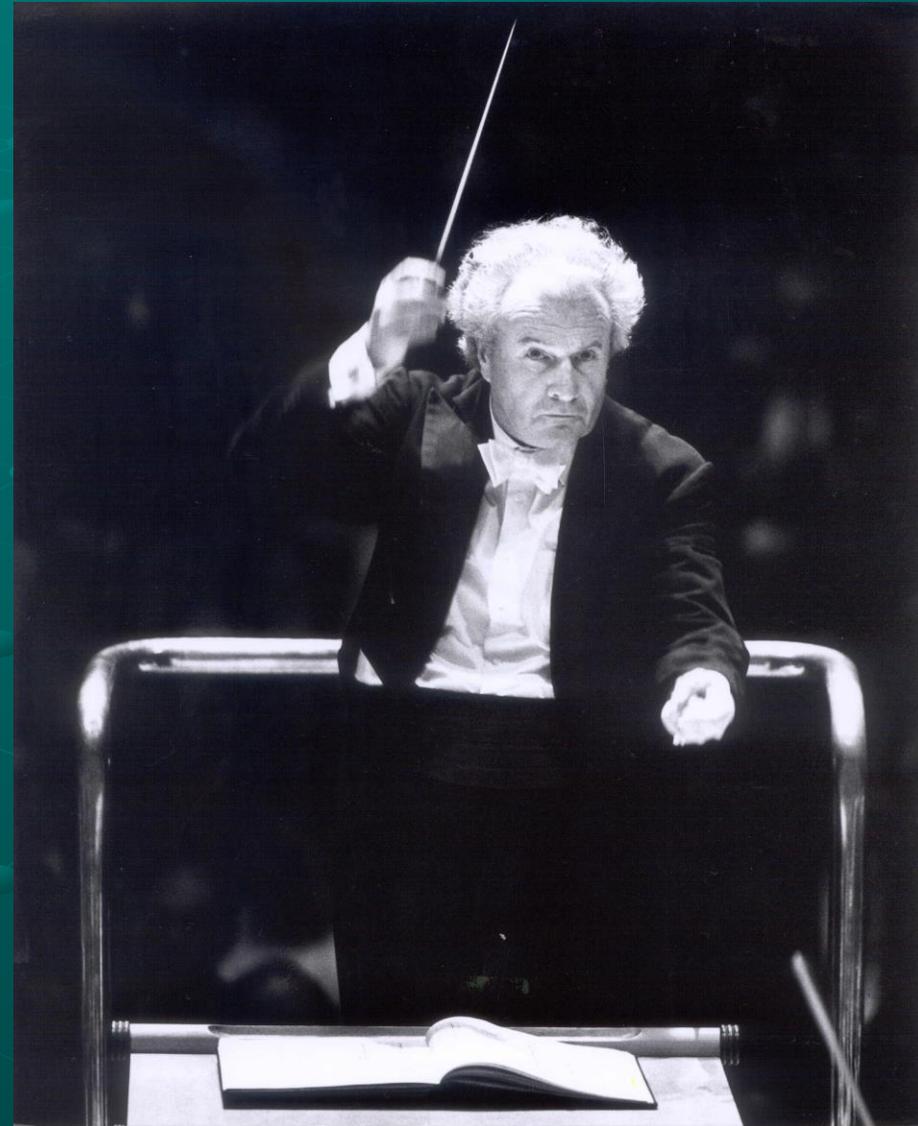
Mechanisms Cause Persistence

- Priming
- Habituation
- Reciprocal Typification
- Institutionalization
- Formalization
- Artifacts
- Concatenation of Procedural Memory
- Calculation
- Competency Traps
- Escalation of Commitment
- Coercion
- Leadership

- *What else?*

- Cumulated number of mechanisms at work in a situation
- Cumulated intensity of mechanisms at work in a situation

Staying on Track

- Note: Mechanisms might interact
  - ★ They might disable or support each other

Typologies of Mechanisms?

- Can be sorted along various dimensions, including..
  - ★ Various degrees of rationality
    - ◎ Automatic to deliberate forms
  - ★ Various levels of aggregation
    - ◎ Individual, dyad, group, organization, society
  - ★ Various types of goal orientation
    - ◎ Intrinsic and extrinsic goals
  - ★ Various degrees of effectiveness
    - ◎ More or less predictive
- Can we create an exhaustive typology?
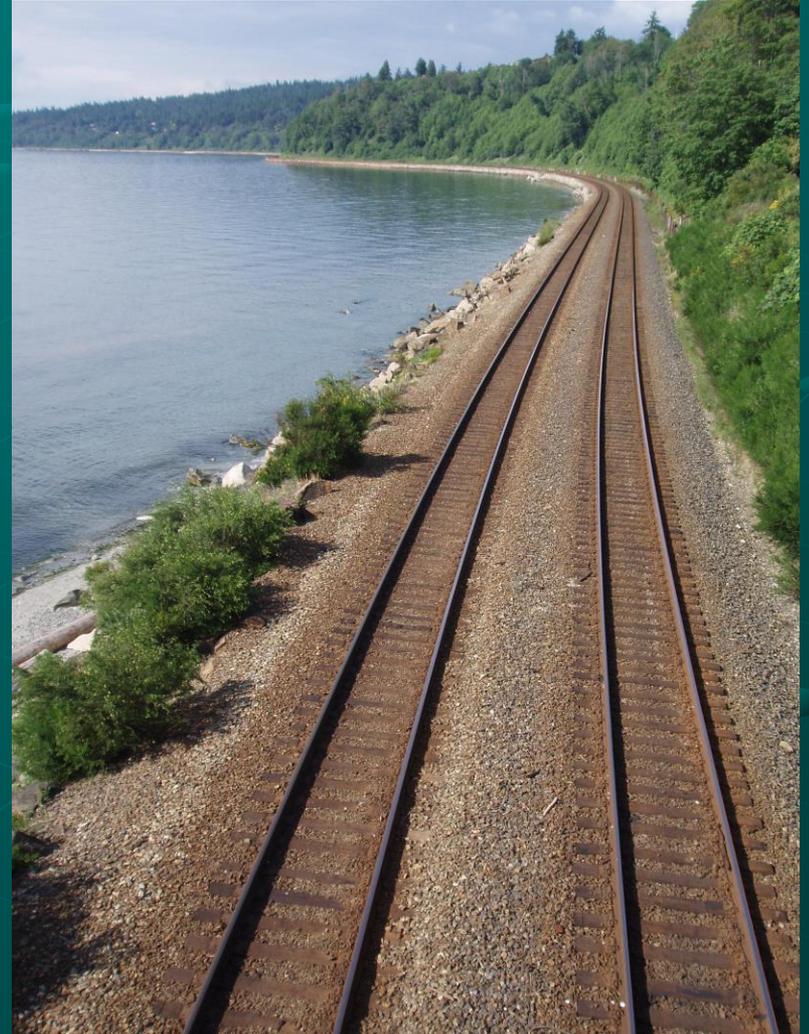 - ★ Not so sure

Tricky Issues

- **How do mechanisms interact?**
  - ★ **Disabling or supporting each other**
- **When does sequential order of subroutines matter, and when not?**
  - ★ **Sequential vs pooled interdependence**
- **Fault tolerance?**
  - ★ **Which subroutines are non-essential?**
  - ★ **Can subroutines substitute for others?**
- **How do mechanisms affect routine combination?**
  - ★ **E.g., combine a routine based on mutual typification with one based on calculation**

Discussion

- Mechanisms of selection ➔ Routine persistence
- Need empirical research
  - ★ How effective the mechanisms are
  - ★ How they co-evolve with routines
  - ★ How subroutines interact
- What happens if we extend Luhmann's system theory to routines?
  - ★ Would it make sense to consider routines as 'autopoietic systems'?
  - ★ Anschlußfähigkeit
    - ◎ "Low hanging fruit" have an advantage?
    - ◎ Same-domain effects?

Conclusion

- Exploring the internal mechanisms that keep routines on track might be productive.

- Empirical research – rich area

- Routines as autonomous engines of history

The End