Arne’s transient hypofrontality hypothesis: A bridge between flow and meditation

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Abstract

Recent neuroscience evidence indicates that a particular type of transient hypofrontality, increased synchronization between limbic and cortical brain regions, is a common factor in both flow (optimal experience) and meditation (a contemplative experience). A novel research program is proposed to pinpoint how to cause this synchronization, and in turn, to examine its effects. Crucial is the development of measures of this type of transient hypofrontality. Hypotheses are freely drawn from research on both meditation and flow, breaching traditional categorical boundaries. Preliminary correlational data is presented along with a plan for longitudinal evaluation.
Meditation

Need a crisp theoretical model!

Carrington (1977, pp. 8–9 & 91)

From Delmonte (1987)
to Bond et al. (2009) → little progress
Neuroscience to the rescue

Arne Dietrich (2003, 2004) synthesized the evidence

- Brain anatomy
- Altered states of consciousness
Theory construction team

Charles Driver (MPI Berlin)
Karen Schmidt, Steve Boker, UVa grad students
Ramesh Manocha (University of Sydney)
Mom (Joshua’s) and colleagues whom I forgot to mention
Don’t let me off easy

Challenge me. Ask questions. Play devil’s advocate.
Hierarchy of consciousness

- Brainstem
- Thalamus
- Limbic system (hippocampal formation, cingulate cortex, amygdala)
- Cortical level (temporal, occipital, and parietal cortex; ventromedial)
- Dorsolateral prefrontal cortex

http://www.abc.net.au/catalyst/stories/2364899.htm
Brain anatomy

http://www.webmd.com/brain/picture-of-the-brain
Brain anatomy

Phenomenology

Study of the 1st person

Phenomenological subtraction

http://irez.me/2012/07/13/descartes-imagination/
Phenomenology

Study of the 1st person

Phenomenological subtraction

http://irez.me/2012/07/13/descartes-imagination/
Meditation reconceptualized

http://www.free-meditation.ca/archives/5984
Flow, neuroscience perspective

Explicit processing reduced; implicit processing increased

How?

http://bizbraininterpreter.com/when-you-are-over-thinking-it/

Self-actualization, peak experience, optimal human functioning, flow
Flow triggers

http://blog.readytomanage.com/getting-away-from-fight-or-flight-and-into-the-flow/

Flow as related to challenge and ability.¹
Social flow triggers

- shared clear goals
- serious concentration
- good communication
- equal participation
- element of risk
- familiarity
- blending egos
- sense of control
- close listening
- always say yes

(Images retrieved from)
Flow triggers, summary

Individual

► clear goals
► challenge/ability ratio
► immediate feedback

Group

► shared clear goals
► serious concentration
► good communication
► equal participation
► element of risk
► familiarity
► blending egos
► sense of control
► close listening
► always say yes

+ maybe more

https://www.futurlec.com/SwRocker.shtml
Berkovich-Ohana and Glicksohn (2014) identified common phenomenological and neurological properties:

1. greater availability of the implicit system
2. integration of implicit and explicit knowledge systems

We name this particular type of prefrontal hypofunction *transient implicit-explicit synchronization* (TIES).
Reconciliation → TIES

http://www.enoughmagazine.org/the-zone/

Old model

meditation (vaguely defined) → self actualization
stress reduction → physiological benefits

https://www.healthypetnetwork.org/images/photo_contest/RelaxedCat.jpg
New model

contemplative practices \rightarrow TIES \rightarrow self actualization
flow triggers
stress reduction

?
## Candidate measures of TIES

<table>
<thead>
<tr>
<th>function</th>
<th>anatomical correlate</th>
<th>absence of the function</th>
</tr>
</thead>
<tbody>
<tr>
<td>interpreter(^4)</td>
<td>left orbitofrontal cortex</td>
<td>mental silence</td>
</tr>
<tr>
<td>distinguish self from other(^5)</td>
<td>right parietal lobe</td>
<td>sense of oneness</td>
</tr>
<tr>
<td>conscious will(^6)</td>
<td>frontal lobe</td>
<td>spontaneity</td>
</tr>
<tr>
<td>duration accounting(^7)</td>
<td>working memory</td>
<td>timelessness</td>
</tr>
</tbody>
</table>

[4](http://respect-discussion.blogspot.com/2012_09_01_archive.html)
Measures

triggers
► contemplative training
► barrier
► spontaneity (intervention)
► object of attention
► social flow triggers

TIES
► mental silence
► sense of oneness
► timelessness
► spontaneity (experience)

outcomes
► self actualization
► (mental) health
Measures

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http://en.wikipedia.org/wiki/Science
Training, barrier ⟷ mental silence
Measures

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http://en.wikipedia.org/wiki/Science
Training, mental silence $\rightarrow$ positive affect

The shaded area shows the 95% confidence interval of the correlation. Blue is TIES. Pink is training. Dash line is TIES minus training.
Measures

triggers
  ▶ contemplative training
  ▶ barrier
  ▶ spontaneity (intervention)
  ▶ object of attention
  ▶ social flow triggers

TIES
  ▶ mental silence
  ▶ sense of oneness
  ▶ timelessness
  ▶ spontaneity (experience)

outcomes
  ▶ self actualization
  ▶ (mental) health

http://en.wikipedia.org/wiki/Science
Training, mental silence $\rightarrow$ self-actualization

The shaded area shows the 95% confidence interval of the correlation. Blue is TIES. Pink is training. Dash line is TIES minus training.
Measures

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http://en.wikipedia.org/wiki/Science
Sense of oneness

Proposal: “During the session, to what extent were you aware of your physical location?”

Responses:

- I was sitting in the room and that’s how I felt.
- I lost track of the boundaries of my physical body.
- I felt a sense of oneness with the whole.
- The sense of oneness was profound and persisted for a few hours after the session.
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TIES
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- sense of oneness
- **timelessness**
- spontaneity (experience)

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http://en.wikipedia.org/wiki/Science
Timelessness

Problems:

- time can compress or elongate
- individual differences in baseline attention to time
- time distortion is commonplace—people don’t consider it noteworthy

Q: “During recent sessions, I think about how much time is remaining in the session ...”

A: continuously, frequently, occasionally, or not at all
Measures

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TIES
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http://en.wikipedia.org/wiki/Science
Spontaneity

<table>
<thead>
<tr>
<th>Feeling of doing</th>
<th>No feeling of doing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Doing</td>
<td>normal voluntary action</td>
</tr>
<tr>
<td>Not doing</td>
<td>illusion of control</td>
</tr>
</tbody>
</table>

How to ask about it?

Needs basic research in social psychology?
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http://en.wikipedia.org/wiki/Science
Object of attention

“attentional resources are used to actively amplify a particular event”

Which event? Does it matter?

Proposal: “During the session, where is it most important for you to focus your attention?”

http://sceneinadifferentlight.com/shooting-through
Measures

triggers
▶ contemplative training
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TIES
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http://en.wikipedia.org/wiki/Science
Family is an obstacle?

http://tvtastic.files.wordpress.com/2011/10/simpsons-family.jpg
One of Shri Mataji’s ideas

http://shrimataji.org/site/in-her-words/shri-mataji-reading-room.html

Maternal scholarship and expression
Conclusion

longitudinal (May/June 2015)
▶ contemplative training
▶ barrier
▶ mental silence
▶ environmental mastery

group term
▶ sense of oneness
▶ timelessness
▶ object of attention

long term
▶ spontaneity (intervention & experience)
▶ social flow triggers
▶ more outcome measures

http://en.wikipedia.org/wiki/Science
flow (via BASE jump)

meditation

APPLICATIONS

family

business
Endnotes

1 Csikszentmihalyi (1988)
2 Sawyer (2007)
4 Gazzaniga (1989)
5 Goldberg, Harel, and Malach (2006); Newberg et al. (2001)
7 Rammsayer (1999)
8 Dietrich (2003, p. 243)


Basic Books.