Bad Things May Be Good for You: creativity and regret

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today I am not talking about …

• intelligent internet interfaces
  fuzzy personal ontologies and
  structure from folksonomies

• visualisation and sampling

• situated displays, eCampus,
  small device – large display interactions

• fun and games, virtual crackers,
  artistic performance, slow time

• physicality and product design
… or even lots of lights

http://www.hcibook.com/alan/projects/firefly/

… but I will talk about

bad ideas for creativity and design

understanding regret

linked by imagination and rationality

for innovation in computing

using computational modeling
bad ideas for creativity and design

origins ... nearly 15 years ago, UG research methods ... 

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design exercise (recent example)

Collaborative or Social Networking Thing* for babies and/or parents of babies …

… but … design a bad one / silly one

* at least some physical token or device, not purely web/digital
prompts …

THE BAD
1 what is bad about this idea?
2 why is this a bad thing?
3 are there any other things that share this feature but are not bad?
4 if so what is the difference?

THE GOOD
1 what is good about this idea?
2 why is this a good thing?
3 anything that shares this feature but is not good?
4 if so what is the difference?

try different contexts
used car salesman – how would you sell it to someone?

make it a good idea

• What is good - keep it
• What is bad - change it
• Change context
• Learn from aspects
why bad ideas?

training:
  – low commitment => easier to critique

design:
  – large jumps through the design space

why bad ideas?

training:
  – low commitment => easier to critique

design:
  – large jumps through the design space
why bad ideas?

training:
– low commitment => easier to critique

design:
– large jumps through the design space
– understanding of the design space

plus ...

• other divergent techniques:
  – random metaphors, putting ideas together

• arbitrary constraints:
  – time, materials, etc.

• externalisation

• personality prostheses
bad ideas ... related things ...

critical transitions
examples

critical transitions

• construct a boundary case …
  – example A in category B not in category
  – make ‘path of small changes from A to B
  – where does it ‘cross’ the boundary
  – good for ‘felt’ categories
but how to find examples?

- generating examples – hard
- examples from experience easy ??? or is it ???

past  now

old concept

experience

need

but how to find examples?

- generating examples – hard
- examples from experience easy ??? or is it ???

past  now

new concept

experience

generate
case example

similar surface characteristics

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but how to find examples?

• generating examples – hard
• examples from experience ... actually harder!

but .. generating examples ...
• take arbitrary concrete example
• morph to new concept
• constant concrete – abstract movement

modelling regret

WARNING! speculative
why regret?

it seems such a negative emotion

is there some adaptive reason for it?

... or just an accident

features of regret

• modal/counterfactual “what if” analysis
• worst when you ‘nearly’ averted disaster
• seems to be about learning

so how do we learn ....
basic reactions - learning

1. Touch thorn
2. Thorn pricks finger
3. Evaluation: Ow! It hurts!
4. Learnt association: Touching thorn is bad

basic reactions – moderating action

1. About to touch thorn
2. Learnt association: ‘Fires’
3. Bad feeling
4. Veto

No action!
basic reactions – moderating intention

(1) imagination of planned action

(2) causes similar brain activity to actually doing it!

(3) learnt association fires

(4) veto

emotion

action

senses

only works for instant effects

so what about delayed effects?

(e.g. poisonous plant)

need imagination!
delayed effect – the gap

1. Touch plant

2. Some time later your finger is sore.


4. Desire to make sense.

delayed effect – bringing to mind

5. Recent salient events brought to mind.

6. Causes simultaneous activation in relevant areas.

7. Learnt association: don’t touch that plant.
delayed effect – put it together

(1) drink beer
(2) next morning feel sick
(3) evaluation yuck :-(
(4) desire to make sense
(5) recent salient events brought to mind
(6) causes simultaneous activation in relevant areas
(7) learnt association drinking beer is yucky

and now regret ...

similar but also: causal connections moderating emotions
regret – the gap

1. drink beer
2. next morning feel sick
3. evaluation yuck :
4. desire to make sense

regret – casual thinking

1. drink beer
2. next morning feel sick
3. evaluation yuck :
4. logical deduction of what mattered determines what is brought to mind
5. imagination causes simultaneous activation in relevant areas
6. causes negative emotion
7. learnt association even though action not obviously linked or most salient "drinking beer is yucky"

"if only I hadn’ t" ... regret
regret – modifying emotion

(5) imagination causes simultaneous activation in relevant areas

(6) logical deduction of how much it matters influences strength of emotion

(7) learnt association stronger or weaker depending on strength of emotion

(4) logical deduction of what mattered determines what is brought to mind

emotion

action

senses

but is it true?

if I were a psychologist
   I would run an experiment

if I were a brain scientist
   I would do a scan

but as a computer scientist ...
   ... build a computer model
model architecture

- Game mechanics
- Stimulus: cards dealt
- Response: stick/twist
- Effect: win/lose
- Basic ML module
  - Lookup and choose
  - SRE assoc
  - Emotion
  - Update
  - Modify
- Plug-in regret module
- Post-hoc info.
- Further cards dealt

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it works!
fastrer (not better) learning 😊

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the data

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<th>iteration</th>
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<tr>
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<td>1000</td>
<td>98.60</td>
</tr>
</tbody>
</table>

and the twist ... positive regret

the code:

\[
\text{if } (\text{effect negative}) \text{ do Regret}
\]

coder thinks, “do we need the condition?”

positive regret?

the grass is greener ...

in code has greatest effect

- ameliorates winner takes all local minima

for people too?
bad things really may be good

Bad Ideas make us creative
  – with the right prompts

Regret helps us learn
  – maybe machines too

understanding how we think helps us:
  – develop practical techniques
  – maybe even tools