Pleasure purpose study

2 Nov 2015

How are purpose and pleasure integrated in making choices about how to spend your time?

- Stimuli: 80 descriptions of events Procedure
  - Session 1: Rate each event (pleasure, purpose)
  - Session 2 (fMRI): Choose between events
  - Session 3: Choose between events outside the scanner

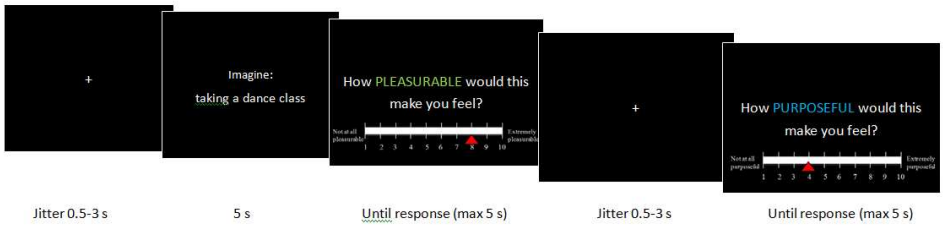
'doing a crossword puzzle'
'doing the dishes'
'paying the monthly bills'
'listening to news on the radio'
'making a salad'
'cleaning the kitchen'
'playing a musical instrument'
'watching a cartoon with children'
'going for a run with a friend'
taking a friend's dog for a walk'
'playing football in the park with friends'
'reading for work or school'
'watching TV'
'listening to popular music'
'playing computer games'
'playing with children'

- Pairing of choice options (session 2) was via sampling:
  - Shuffle all available ratings, pick out pairs that make opposite predictions (e.g. choose Opt1 on PP, Opt2 on PL) [Incompatible choice trials]
  - Doesn't care about extent of differences (e.g. +1 vs -1 is considered the same as +5 vs -1)
  - Every event paired in 2 different trials in session 2
  - Mean no. conflict trials =36.75, SD=15.2

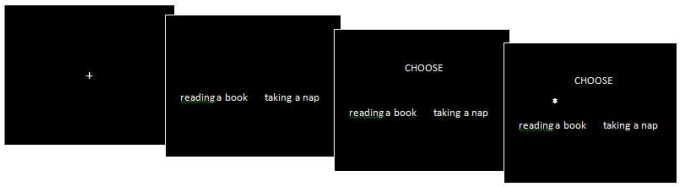
Method - Procedure

We define PLEASURABLE as bringing you positive feelings, such as joy, happiness, or contentment.
We define PURPOSEFUL as feeling meaningful, worthwhile, or fulfilling.

A Session 1



B Session 2 and 3



Basic stats

B-coefficients for PL and PP (all trials)

subject	PL	PP
1	0.491	-0.168
2	0.466	0.201
3	0.512	-0.057
4	1.621	-0.024
5	0.444	0.101
6	0.142	0.116
7	0.143	0.401
8	1.15	-0.108
9	0.355	0.008
10	0.497	0.077
11	0.635	0.089
12	0.215	-0.016
13	0.667	-0.199
14	0.436	-0.007
15	1.912	0.502
16	0.209	0.047
17	0.11	0.027
18	0.332	0.034
19	0.499	-0.139
20	0.283	0.071
mean	0.556	0.048
Single regression	**0.419**	**-0.004**

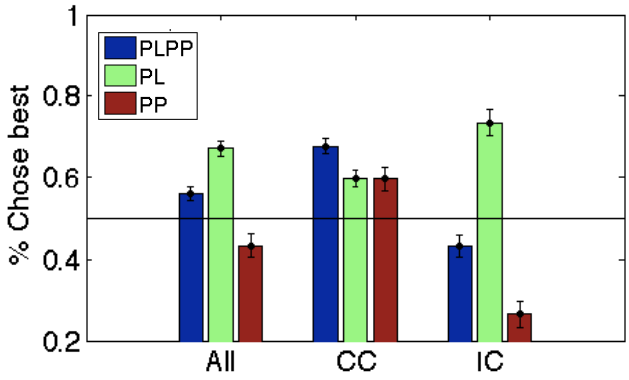
% decisions based on PL or PP (under conflict)

subject	PL higher	PP higher
1	82.10%	17.90%
2	65.90%	34.10%
3	76.00%	24.00%
→ 4	93.50%	6.50%
5	72.20%	27.80%
6	48.10%	51.90%
7	45.50%	54.50%
→ 8	95.70%	4.30%
9	78.60%	21.40%
10	77.40%	22.60%
11	72.70%	27.30%
12	61.70%	36.20%
13	73.10%	26.90%
14	76.20%	23.80%
→ 15	92.60%	7.40%
16	64.70%	35.30%
17	58.10%	41.90%
18	66.70%	33.30%
→ → 19	100.00%	0.00%
20	66.70%	33.30%
mean	73.40%	26.50%
SD	14.70%	14.70%

2 groups: PL-driven group v.s. PL&PP group

Comparing trials where choice is clear vs choice is conflicted

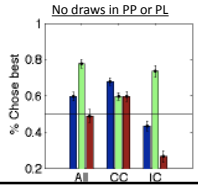
- Subjects overweight pleasure when behavioural conflict occurs
- There is still a lot of variance to be explained (peaking at about .8)



Incompatible choice (Behavioural conflict)

CC: Compatible Choice
IC: Incompatible Choice

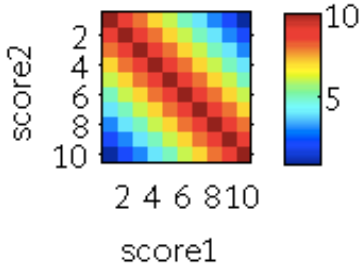
PL: Pleasure
PP: Purpose



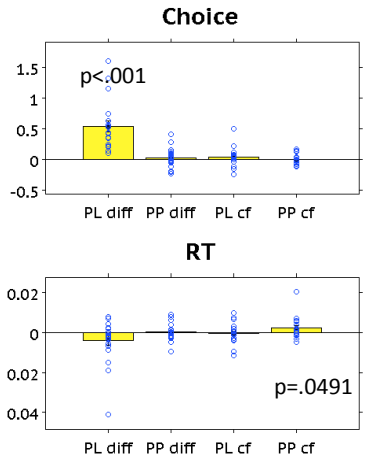
CC: The PLPP bar here is higher than the others (even when draws in PL/PP are deleted) because sometimes, PL+PP leads to draws at the PLPP level (which are then ignored for this index), which means that the no. of cho-PLPP is divided by a smaller number

1. Regression analysis (all trials)

PL is more important to choice, but PP-domain conflict leads to RT slowing

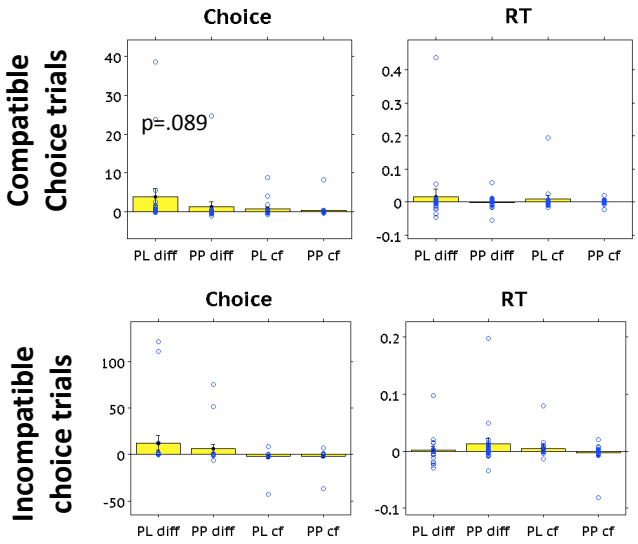


- Value diff in Pleasure domain affects choice
- Value conflict in the Purpose domain slows RT

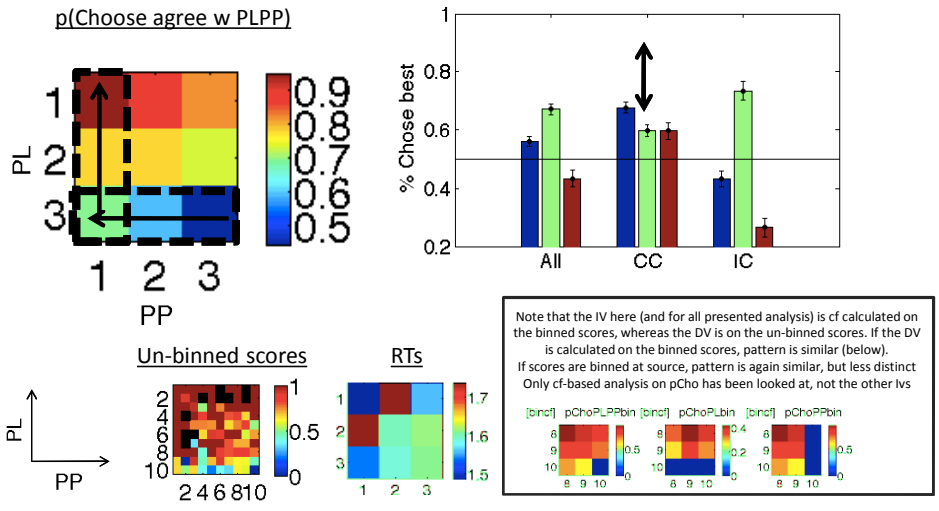


Note: p19's PP cf beta on RT is an outlier (>3SD from mean). Removal leaves a statistical trend (p=.0543), use of a Wilcoxon signed rank test is still sig (p=.043)

1. Regression analysis (split trials)



2. On compatible-choice trials, conflict in both domains affects the likelihood of making the best choice

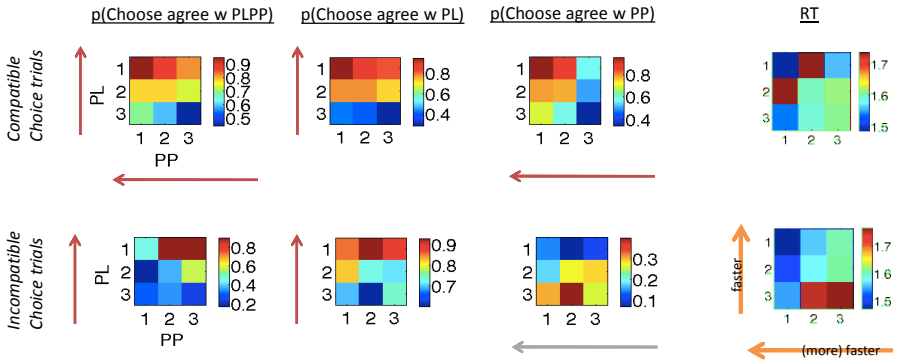


3. PP-conflict's effect on choice disappears on IC trials, but it continues to exert influence

IC trials:

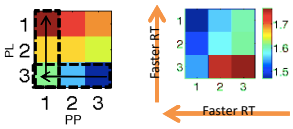
- PL/PP conflict leads to RT slowing, but *more so* for the purpose domain

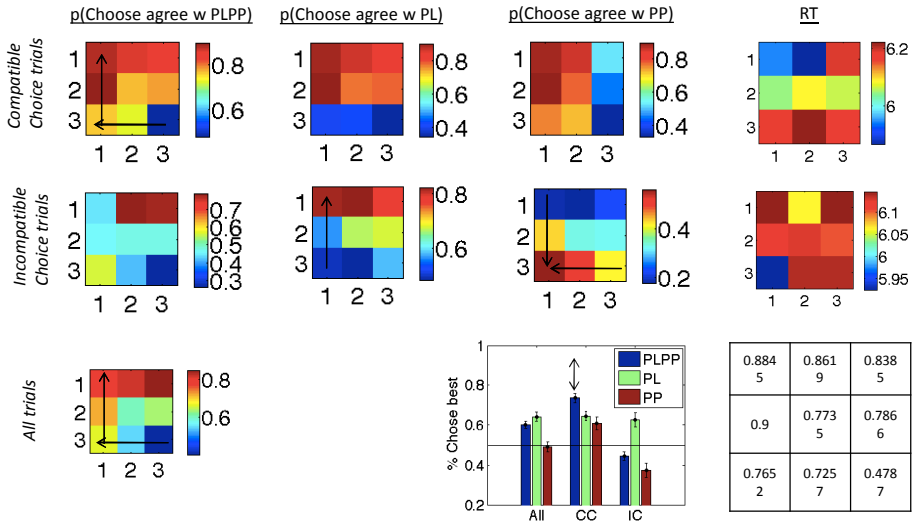
→ Going against the typical value integration is computationally costly



4. Do we find the same pattern in the behavioural pilot data?

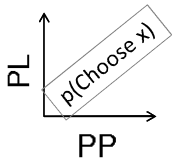
(independent sample)

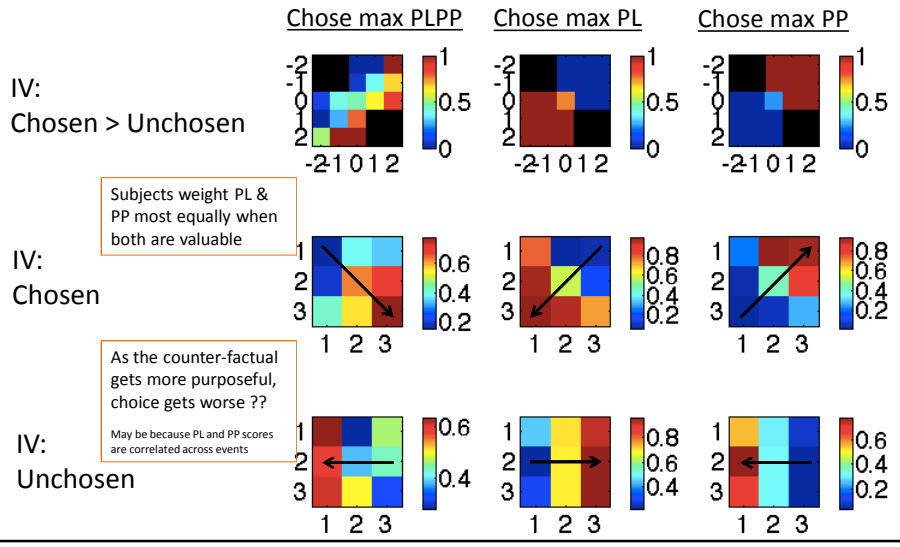




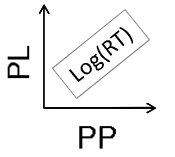
0.884 5	0.861 9	0.838 5
0.9	0.773 5	0.786 6
0.765 2	0.725 7	0.478 7

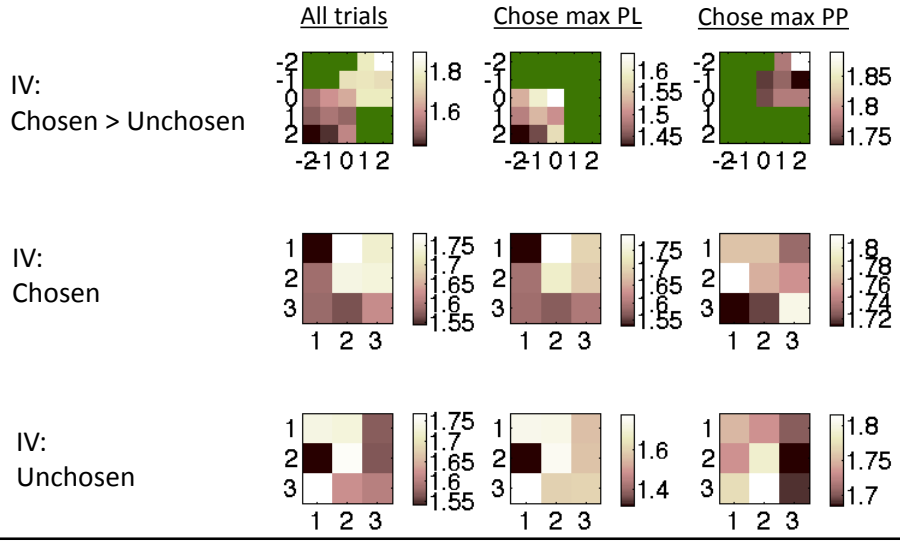
5A. Choice on IC trials



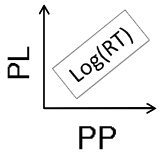


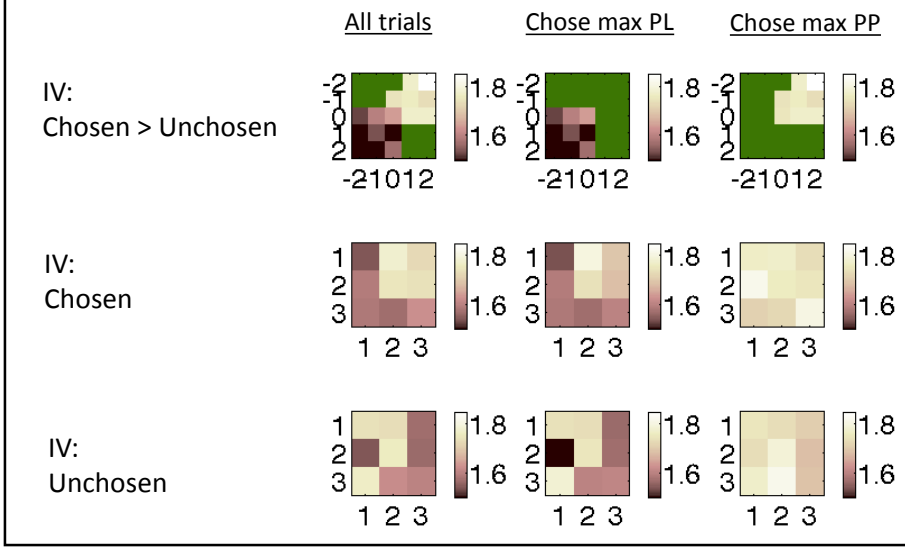
5B. IC trials: RTs (different scales)



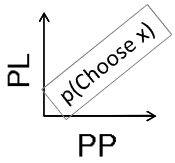


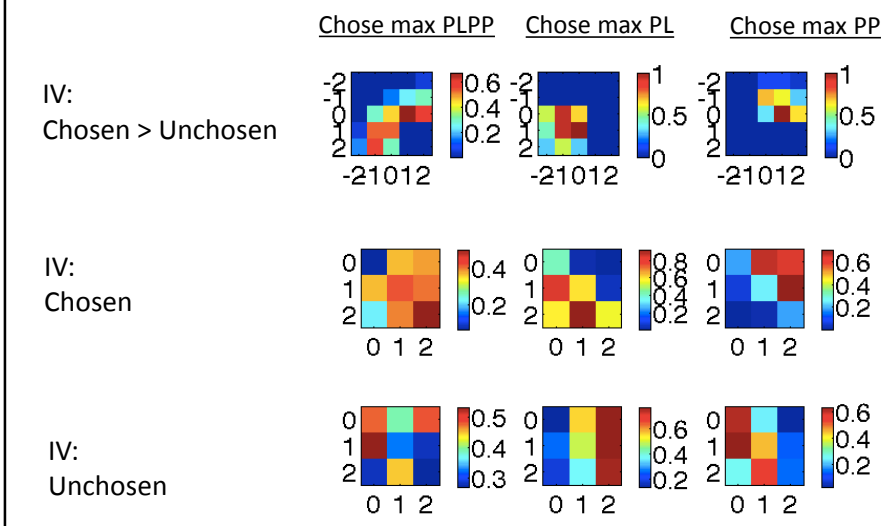
5B. IC trials: RTs (same scales)





5D: Pilot data: Choice on IC trials



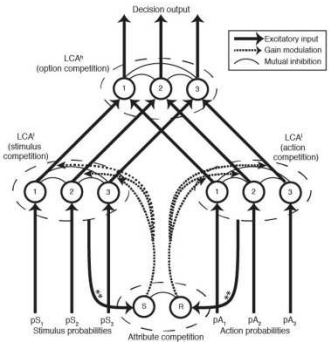


Hierarchical LCA

- PP and PL each get a (quantitative) 'vote', vote is then integrated
- When vote integration does not happen smoothly (incompatible votes), → over-ride

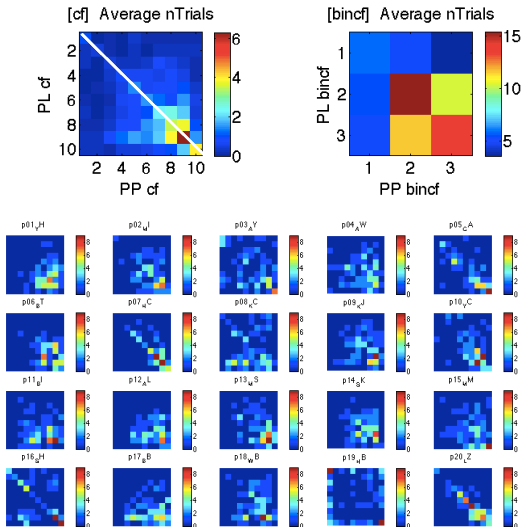
Headline: Try the LCA first because it gives the best chance of a maximally mechanistic model-fit.
If nothing can be done with the LCA, then resort to simple descriptive models (which do not allow for satisfying RT explanations)

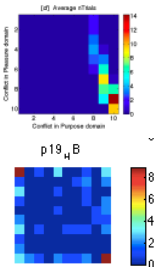
Hierarchical competition model



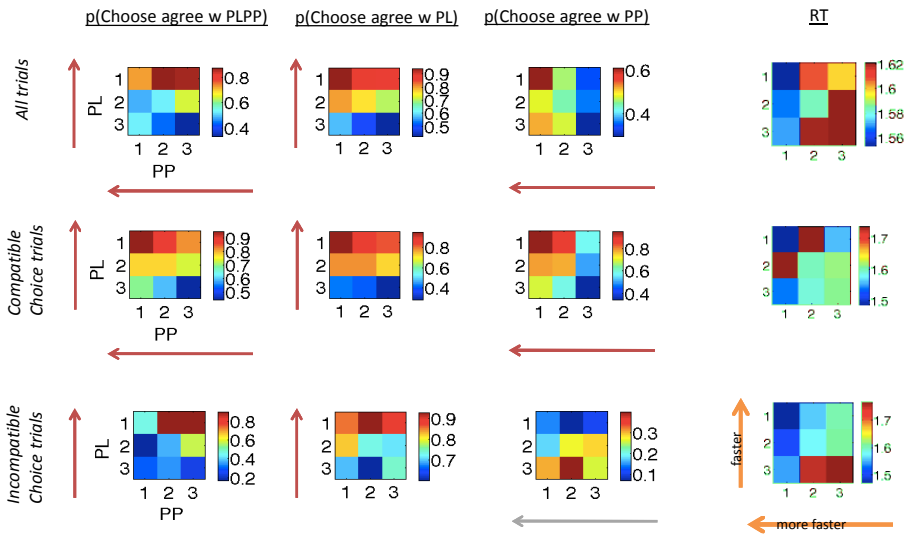
END

Balance in the PL & PP dimensions
(design-wise)

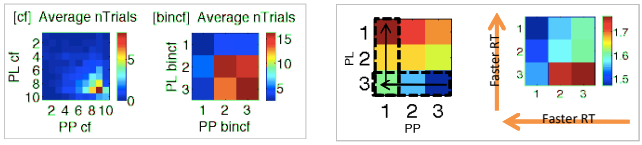


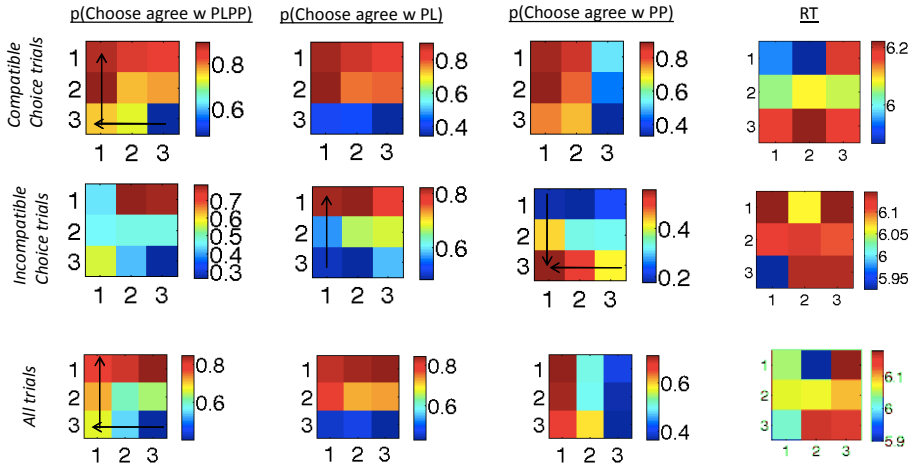


Effect of within-domain conflict on choice



Pilot data





IC trials – N trials