

**Optimal Innovation  
Creative Interpretations of  
Literal and Non-Literal  
Language**

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**Based on**

**<http://www.tau.ac.il/~giorar>**

**Weapons of mass distraction:**

**Optimal innovation and pleasure ratings**

**Giora et al. (2004)**

**Beyond figurativeness**

**Shuval & Giora (2005)**

**Metaphor, coherence, optimal innovation,  
and pleasure**

**Giora et al. (in press)**

**Literal vs. nonliteral language - novelty  
matters.**

**Giora (In press).**

# **Pleasure, Processing, and Nonliteral Language**

**Pleasure:  
What do we find  
agreeable or uplifting?**

**“Strange words simply puzzle us; ordinary words convey only what we know already; it is from metaphor that we can best get hold of something fresh.”  
(Aristotle, Rhetoric)**

**Is it really  
the metaphorical  
that is  
fresh, aesthetic,  
agreeable - inducing  
affect?**

# KNOW HOPE

No hope



Write the word that's  
the opposite of the  
following words:

10-23



nobody



Write the word that's  
the opposite of the  
following words:

10-23

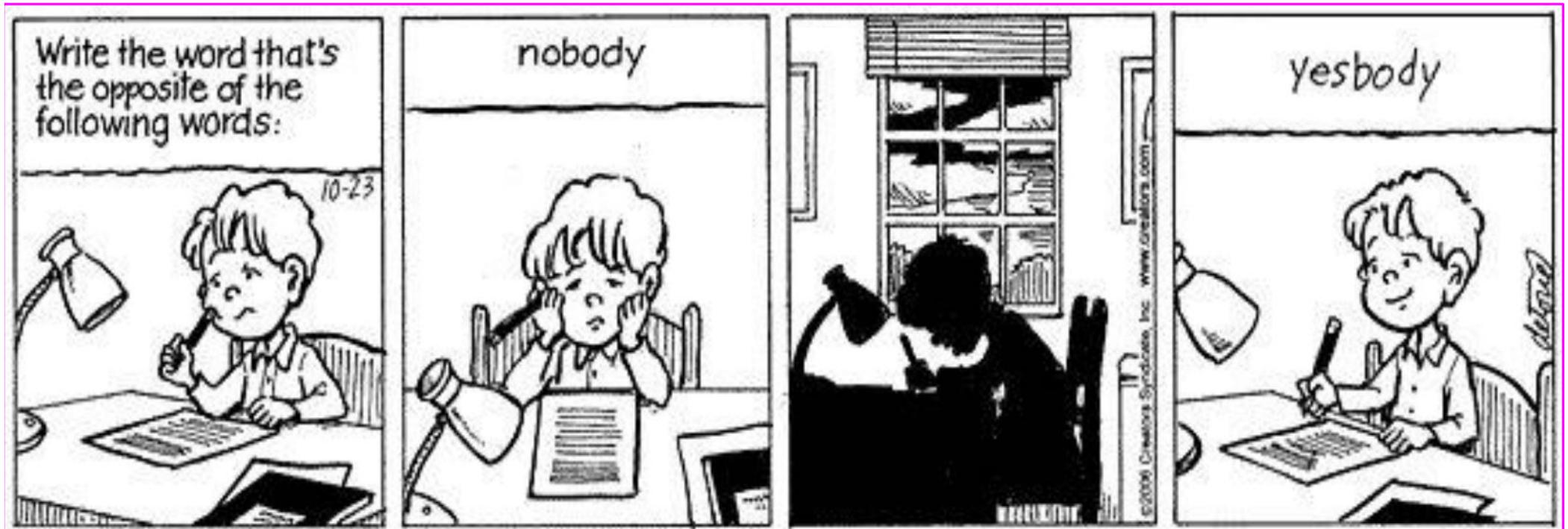
nobody

yesbody



# Nobody - Yesbody

<http://thecrazyteacher.altervista.org/wp-content/uploads/2013/10/nobody-yesbody.jpg>



# Lorenzo Gatti's example



“Oil on canvas”

“Hopefully we can clean it”

# Save our soles

## Save our souls



# Curl up and dye

## Curl up and die



**No to  
ART for  
apARTheid's  
Sake**

**Protesting the Israel Philharmonic Orchestra in NY  
(Oct 29 2013)**

<http://adalahny.org/photo-gallery/1094/pictures-israel-philharmonic-orchestra-protest-oct-29-2013>



# Protesting the Israel Philharmonic Orchestra in NY (Oct 29 2013)

<http://adalahny.org/photo-gallery/1094/pictures-israel-philharmonic-orchestra-protest-oct-29-2013>



# Swan Lake ballet parody

## Les Ballets du Trockadero

<http://www.youtube.com/watch?v=MfKdC6SYcnM>





MEZZO

**Is it really  
the metaphorical then  
that is  
fresh, aesthetic,  
agreeable - inducing  
affect?**

**Not necessarily**

**What about metaphors?**

**Are  
metaphors  
pleasing?**

**Some metaphors are!**

**Some aren't!**

**Kick out**

**Kick out =**

**Get rid of**

**Kick out racism**

**Kick out racism =**

**Get rid of racism**

**Compare**

**Kick out racism**

**to**

**Israelis, Palestinians, and  
football**

**Kick out racism**

<http://www.economist.com/news/middle-east-and-africa/21576151-vexed-question-mixed-football-kick-out-racism>

**Which is more pleasing?**

# Know Pinkwashing

<https://www.facebook.com/kNOwPinkwashing>

**No Pinkwashing**

**No whitewashing**

# PASSOVER

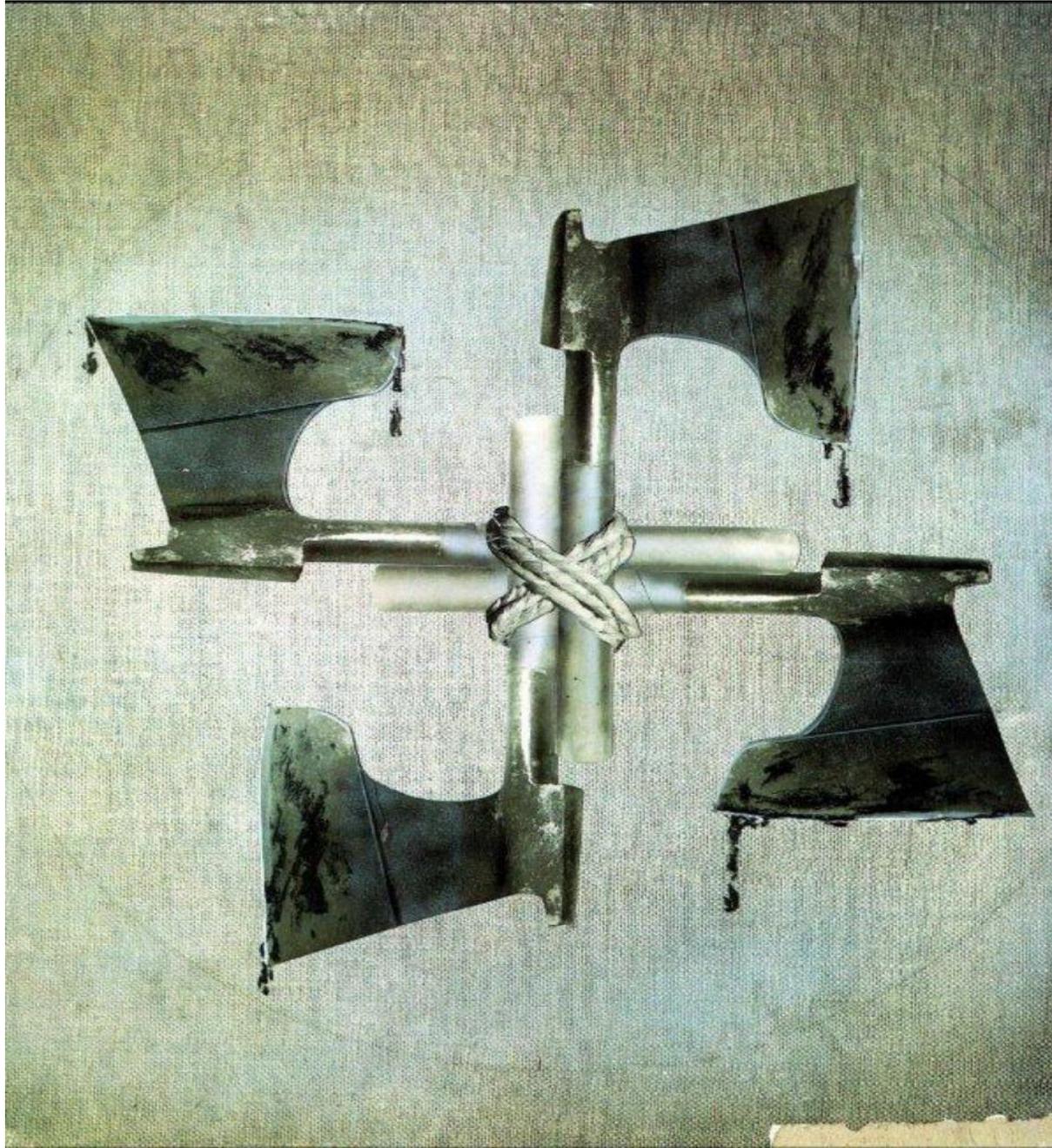
# PASS OVER

## Amnon Illuz (2004)



# Iron and blood

(Heartfield, 1934)

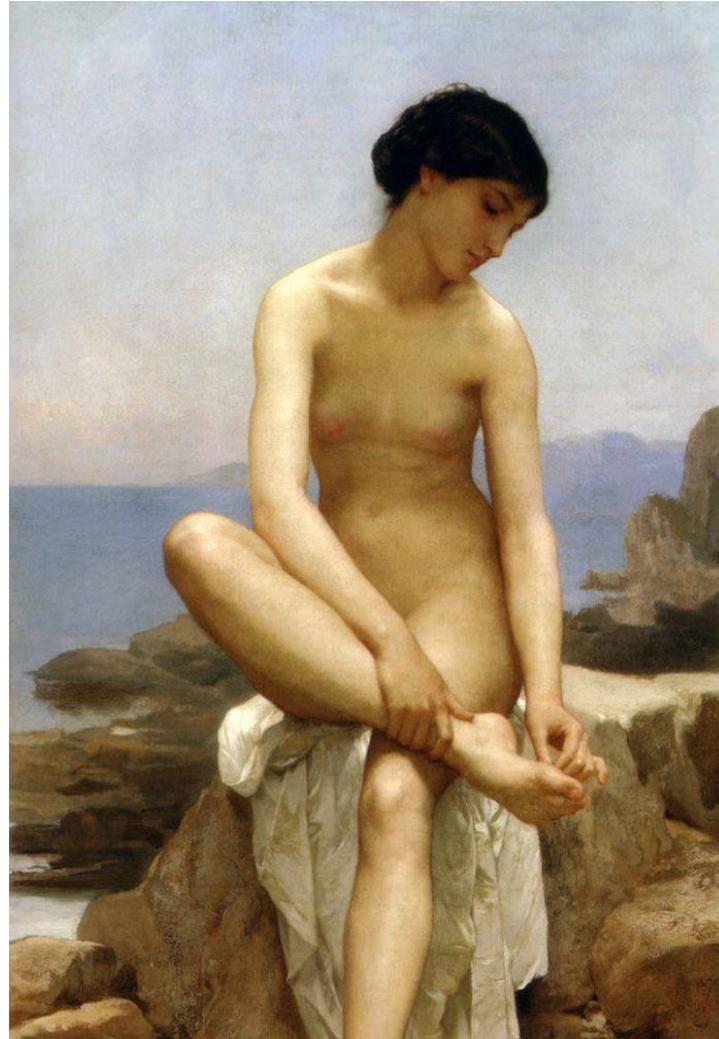


# Wonder Woman



# Bather

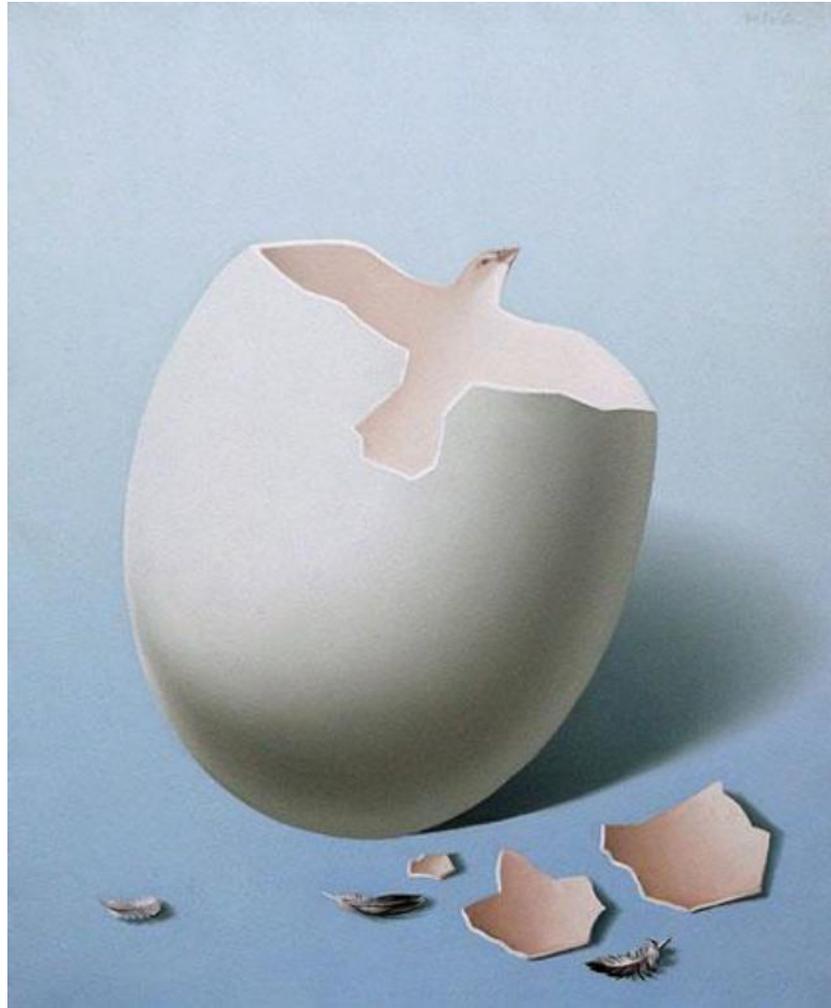
## William Bouguereau (1879)



# Peace dove



# Peace dove



<http://www.chemamadoz.com/a.html>



**What makes stimuli  
pleasurable,  
aesthetic?**

**What makes stimuli  
pleasurable,  
aesthetic?**

**It is  
Optimal Innovativeness  
that is pleasing  
rather than  
metaphor**

# The Graded Salience Hypothesis

**Salient, less-salient, nonsalient**

**meanings/interpretations**

**According to the Graded Salience Hypothesis (Giora 1997, 1999, 2003)**

- a meaning is **salient** if it is coded in the mental lexicon and enjoys prominence due to cognitive factors (**e.g., prototypicality**) or exposure (**e.g., familiarity, frequency, conventionality**), regardless of degree of literalness;
- A meaning is **less-salient** if it is coded but is **less familiar, frequent, etc.**, regardless of degree of literalness;
- A meaning or an interpretation that is not coded is **nonsalient**; it is **novel** or **derived**, regardless of degree of literalness.

# **The Optimal Innovation Hypothesis**

**(Giora, 2003; Giora et al., 2004)**

**Pleasurability  
is sensitive to**

**Optimal Innovation  
(rather than to  
figurativeness)**

# Optimal Innovation

**A stimulus is optimally innovative if it evokes**

**(a) a novel - less or nonsalient - response (Yesbody) alongside**

**(b) a coded salient response (Nobody) from which, however, it differs (both quantitatively and qualitatively), so that both can be weighed against each other.**

**In 8 experiments  
(which were run in Hebrew)  
we tested the  
Optimal Innovation  
Hypothesis**

**6 are reported here**

# The Optimal Innovation Hypothesis

## Experiments 1-6

### Predictions

#### Pleasure and Processing

#### (Effects and Costs)

- 1. Items that meet the criteria for **Optimal Innovation** (being novel yet evoking coded salient but distinct enough meanings such as **Body and sole**) will be rated as most pleasing but will be harder to process compared to salient meanings.**

## 2. Highly familiar items

**(Body and soul)** will rank next in **pleasurability** because we assume that it is the **familiar in the novel** that accounts for pleasure (Freud, 1960).

Processing-wise, however, they will be least effortful.

### 3. Pure innovations

(**Bobby and Saul**)

will be least pleasing because

they **lack in familiarity** which will

also make them most **difficult** to

process.

# Testing pleasure predictions

## Experiment 1

### 1. Items

that meet the criteria for

**Optimal Innovation**

(being **novel** yet evoking **salient**  
**but distinct** enough meanings)

(**Body and sole**)

will be rated as **most pleasing**

## 2. Highly familiar items

(Body and soul)

will rank next in pleasurability  
because we assume that it is  
the **familiar in the novel** that  
accounts for pleasurability  
(Freud, 1960).

### **3. Pure innovations**

**(Bobby and Saul)**

**will be least pleasing because  
they lack in familiarity**

## Pretest 1:

Items – differing in terms of degree of familiarity

**Body and soul** (familiar expression) >

**Bodies and souls** (variant version) >

**Body and sole** (optimal innovation) >

**Bobby and Saul** (pure innovation)

## Pretest 2:

Establishing quantitative differences  
on a 7 point similarity scale

Significant gradual differences were  
found between the variations:

- Body and soul** (familiar expression) [7.00]
- Bodies and souls** (variant version) (5.98) >
- Body and sole** (optimal innovation) (3.76) >
- Bobby and Saul** (pure innovation) (1.41)

## Pretest 3:

Establishing qualitative (meaning) differences on a yes/no difference scale

### Not different

- **Body and soul** (familiar expression)
- **Bodies and souls** (variant version)

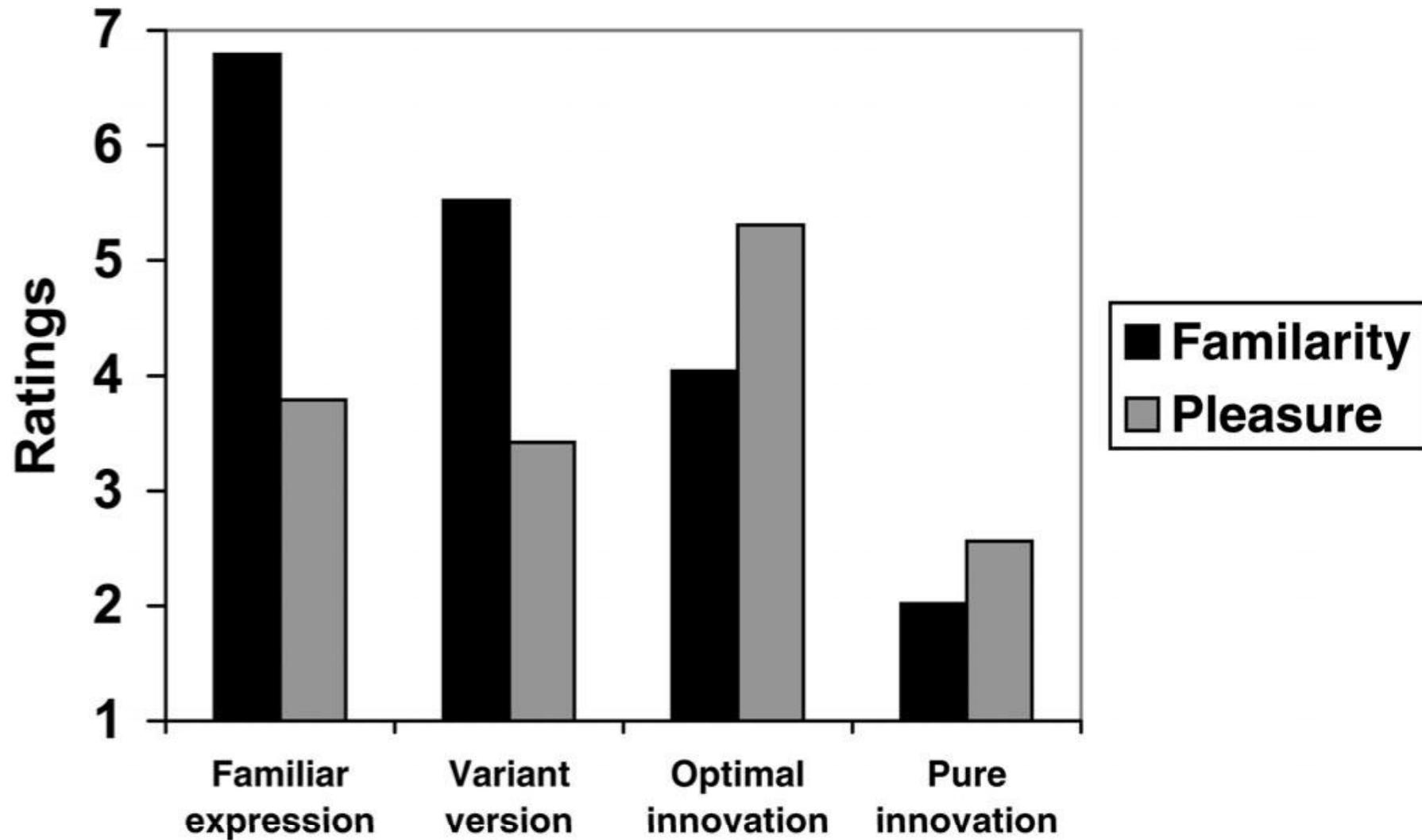
### Different

- **Body and sole** (optimal innovation)
- **Bobby and Saul** (pure innovation)

# Procedure

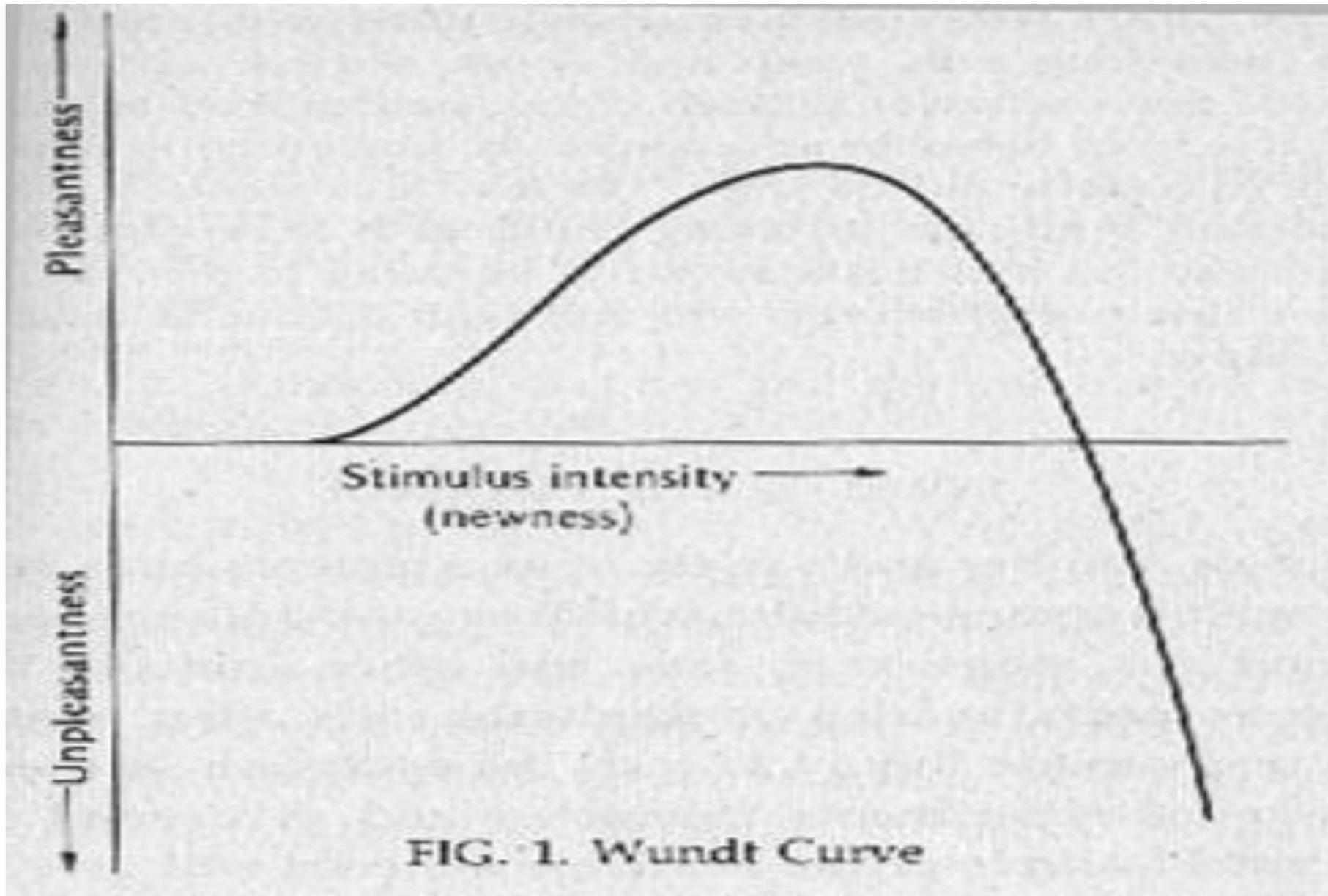
- **Participants were presented the various items and were asked to rate their degree of pleasurability and degree of familiarity.**

# Results



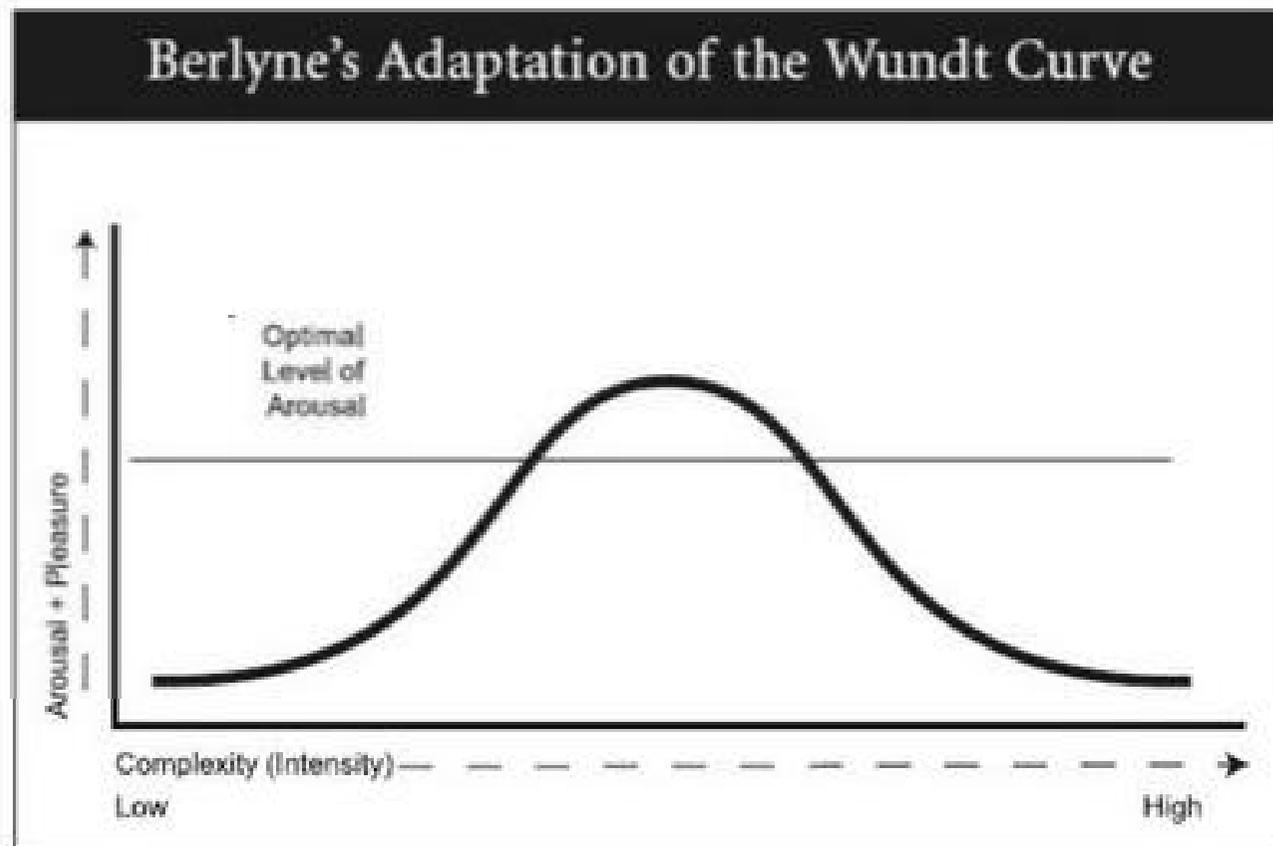
# Wundt's Curve (1874)

Monotonic increase of pleasure



The Arousal model/The-effect-of-mere-exposure model  
(Berlyne, 1971; Bornstein & D'Agostino, 1992; Harrison, 1977;  
Kunst-Wilson & Zajonc, 1980; Zajonc, 1968, 1980, 2000)

Monotonic increase of pleasure



# **Complexity and Beauty**

**The effect of complexity on  
judgements of beauty and  
creativity**

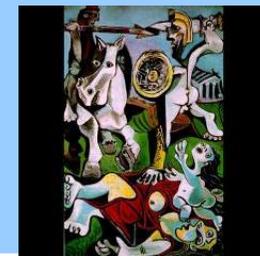
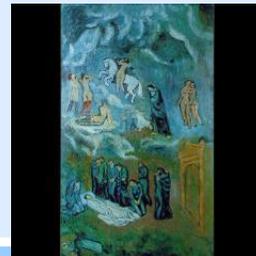
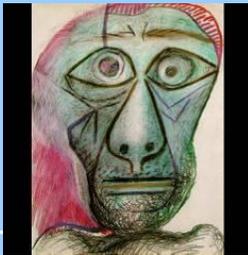
**Bo T. Christensen, Linden J.  
Ball & Rolf Reber (in prep.)**

# Degree of complexity

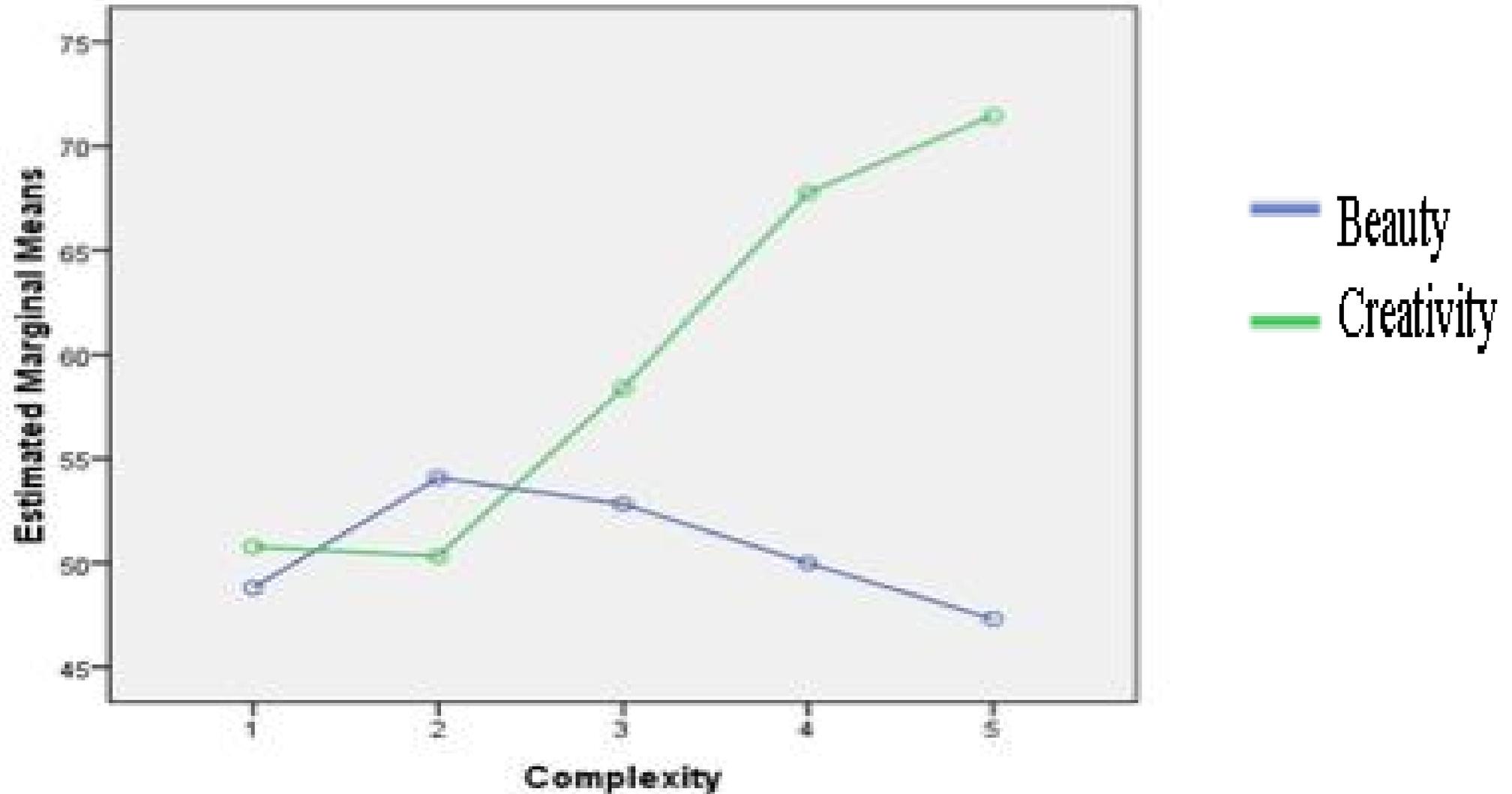
Low Complexity

Medium Complexity

High Complexity

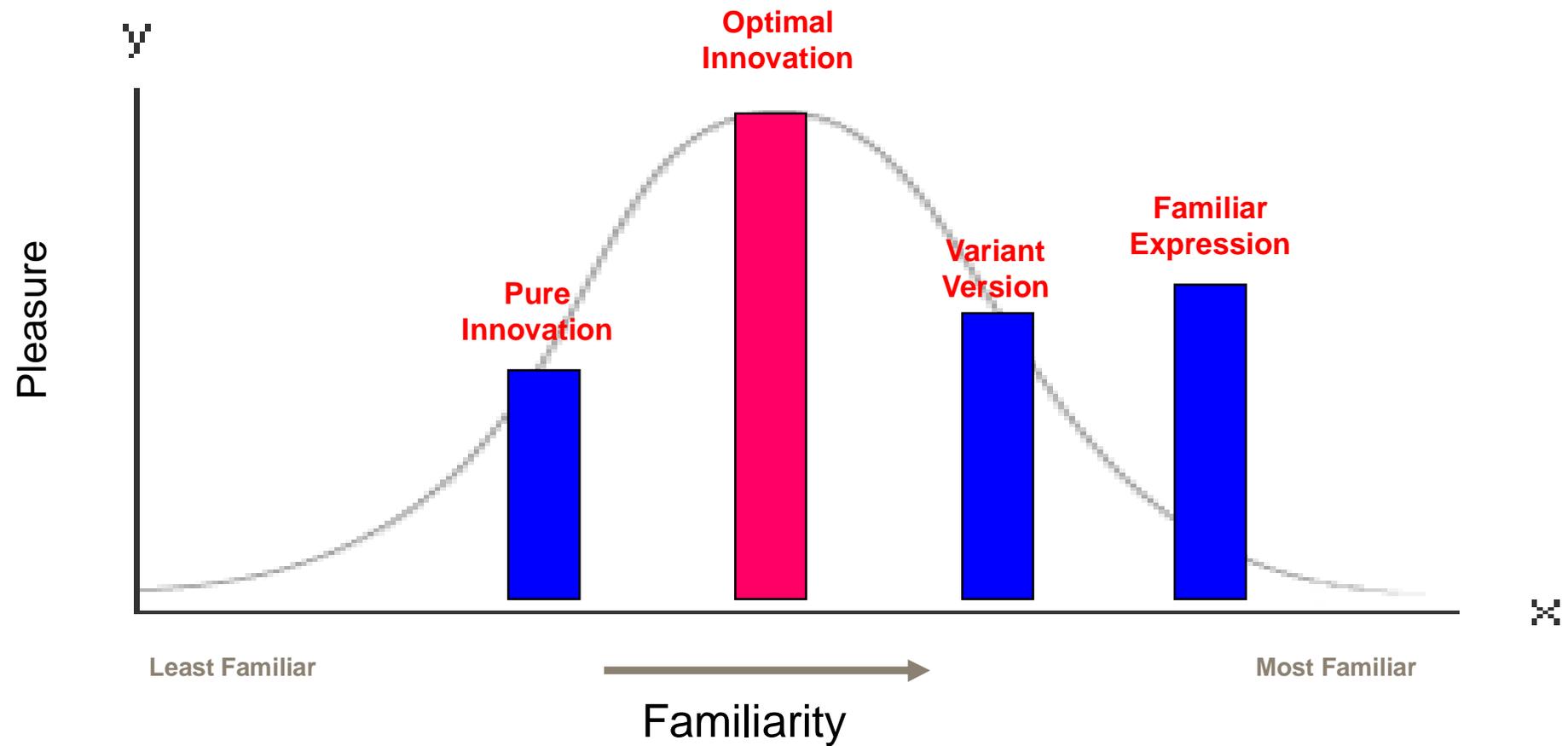


# Complexity beauty and creativity



# Compared to effect-of-mere-exposure model

No monotonic increase of pleasure



# Testing processing predictions

## Experiment 2

**Aimed**

**to show that**

**optimally innovative**

**most pleasing stimuli**

**indeed involve**

**processing** their salient

**but different meanings**

**Prediction:**

**Optimal Innovations**

**will prime their**

**salient response**

Body and soul

will be faster to read

following

Body and sole

than following

Bobby and Saul

# Results

Reading times of familiar targets following optimal innovations were significantly shorter (1.12 sec, SD = 0.41) than following pure innovations (1.21 sec, SD = 0.44),

$t_1(1,39) = 4.69, p < .001,$

$t_2(1,19) = 3.18, p < .005.$

**Optimal Innovations indeed involve  
processing salient meanings of  
familiar stimuli**

# Testing processing predictions

## Experiment 3

Aimed

to demonstrate the assumed

**costs**

of the **benefits** of

**Optimal Innovativeness**

# Predictions: Processing

1. Processing Optimal Innovations will be more difficult (e.g., take longer to read) than familiar stimuli (albeit faster than irrelevant stimuli)

but

2. will be rated as more pleasing than familiar stimuli (and irrelevant stimuli)

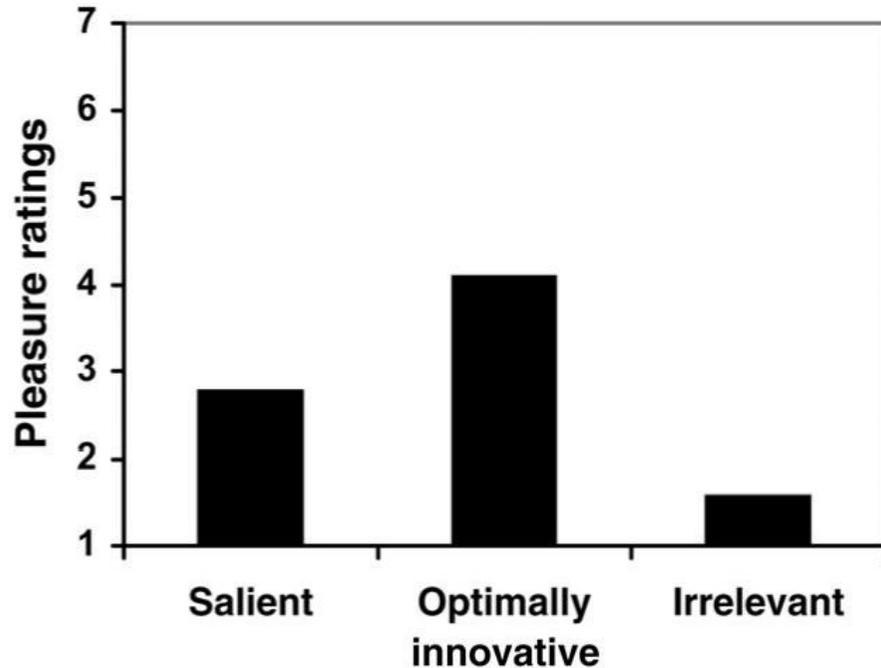
# Procedure

- **Participants read the targets and had to rate them on a 7 point pleasure scale. Reading times were measured by the computer.**

# Results:

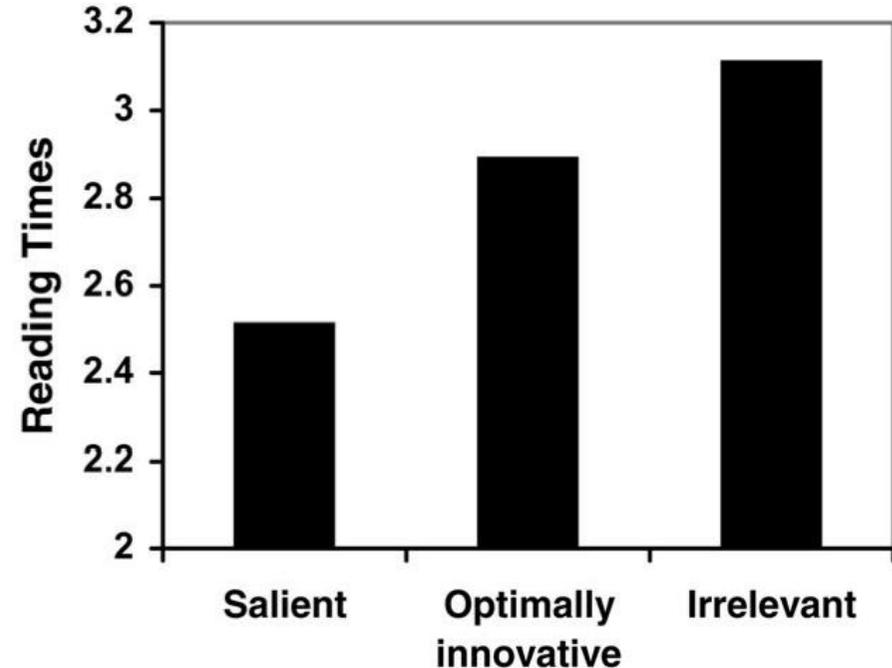
## Pleasure ratings

### Effects



## Reading times

### Costs



**How will metaphors  
fare with regard to  
pleasurability and  
processing?**

**Recall that according to the  
Optimal Innovation Hypothesis  
it is not metaphor  
that is most pleasing and costly  
but  
Optimal Innovation**

# Experiments 4-5

Weigh **benefit** (pleasure)

Against **cost** (coherence)

of novel and familiar

**metaphors**

# Experiments 4-5

## Coherence: predictions

1. (Highly) **novel metaphors** <  
their familiar literal interpretations
2. **Familiar metaphors** =  
their familiar literal interpretations
3. **Highly familiar metaphors** >  
their **low familiar literal interpretations.**

# Experiments 4-5

## Pleasure: predictions

1. (Highly) **novel metaphors** >  
their familiar literal interpretations
2. **Familiar metaphors** =  
their familiar literal interpretations
3. **Highly familiar metaphors** <  
their **low familiar literal**  
**interpretations.**

# Experiment 4

(Giora et al. in press)

Tests predictions 1 - 2

of Coherence and Pleasure:

1. **Novel metaphors** will be less coherent but more pleasing than their **salience-based** literal interpretations
2. **Familiar metaphors** will be as coherent and as pleasing as their familiar literal interpretations

# **Experiment 4**

## **Materials**

**Materials were taken from  
Giora & Fein (1999)  
which were controlled for  
degree of familiarity**

# Familiar items

## Metaphors

He tells me that he's lost my phone number.  
I don't buy it.

## Literals

It's too expensive.  
I don't buy it.

# Novel items

## Metaphors

Shahar told Barak that he looks good, and that his few extra pounds really suit him.

To this Barak replied:

**“Why do you always have to add Tabasco to everything?”**

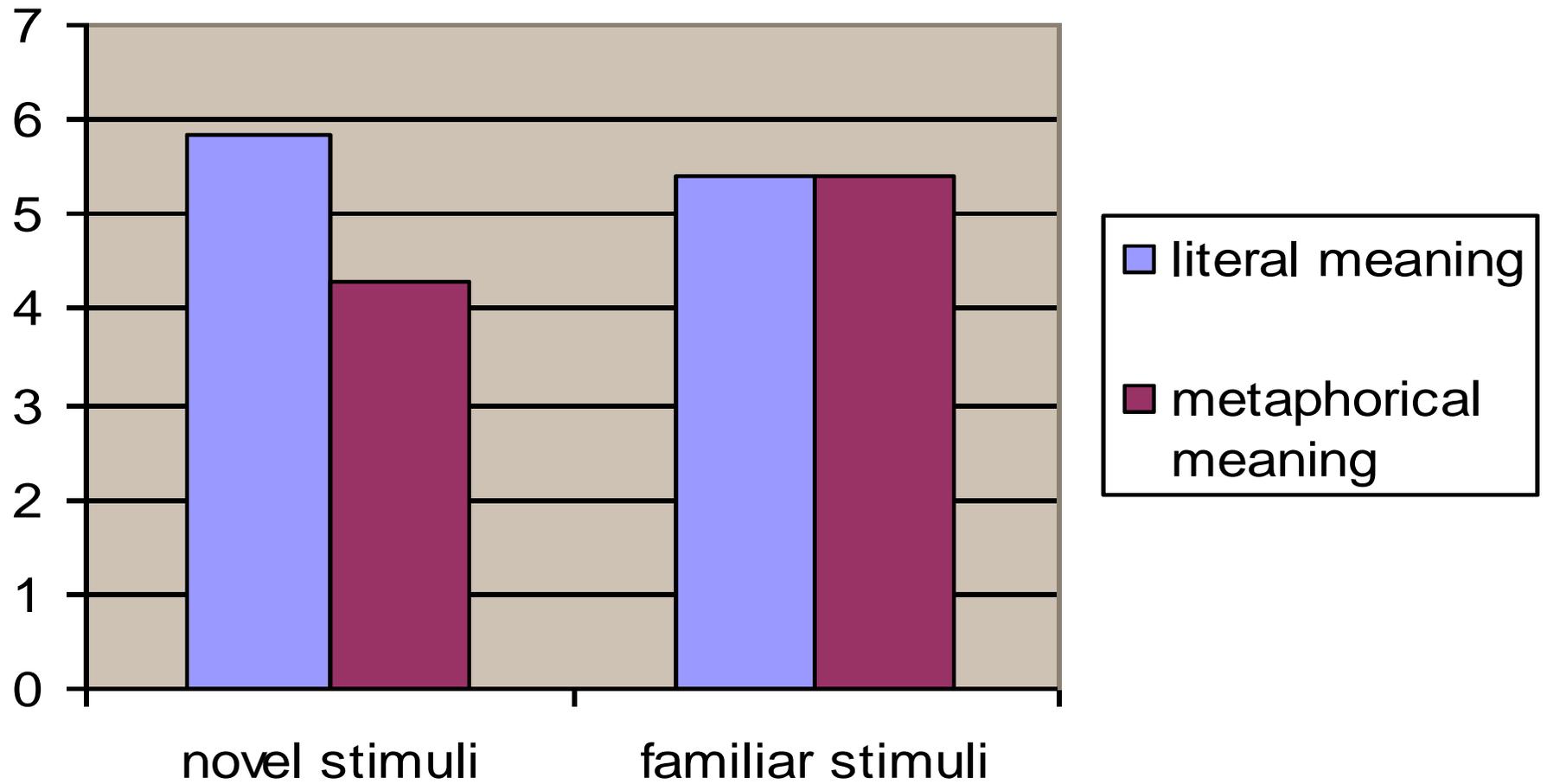
## Literals

After tasting Barak’s pita bread, Keren said:

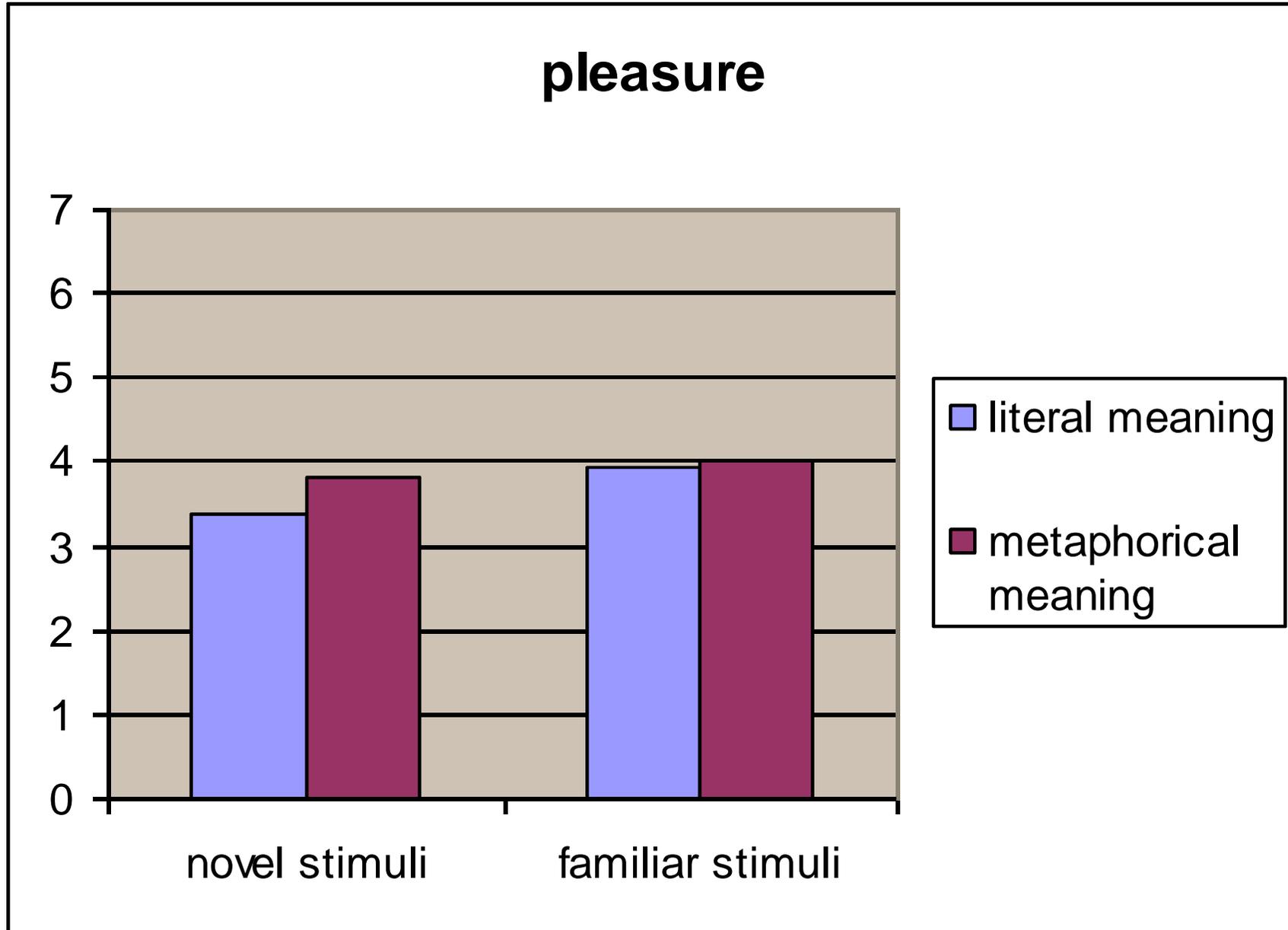
**“Why do you always have to add Tabasco to everything?”**

# Coherence ratings

## Coherence



# Pleasure ratings



# Experiment 5

(Giora et al. 2004)

Tests predictions 1 and 3

of Coherence and Pleasure:

1. Highly novel metaphors will be less coherent but more pleasing than their more familiar literal interpretations.
3. Highly familiar metaphors will be more coherent but less pleasing than their less familiar literal interpretations.

# Experiments 5

## Materials

**200** items presented as **metaphorical** (albeit with plausible literal interpretation) were rated for familiarity, of which the **20 most familiar** and the **20 least familiar** were used as experimental materials.

# Highly familiar items

## Metaphors

**Danny was afraid of flying. After years of therapy he finally managed to grab the bull by the horns.**

## Literals

**Danny won the rodeo after using his hands to grab the bull by the horns.**

# Highly novel items

## Metaphors

Sharon went to sleep very late. In the morning she was supposed to have a very important meeting. At a certain point she almost thought about canceling it because she hates waking up in the morning, looking in the mirror, and seeing

**a geometrical abstract painting.**

## Literals

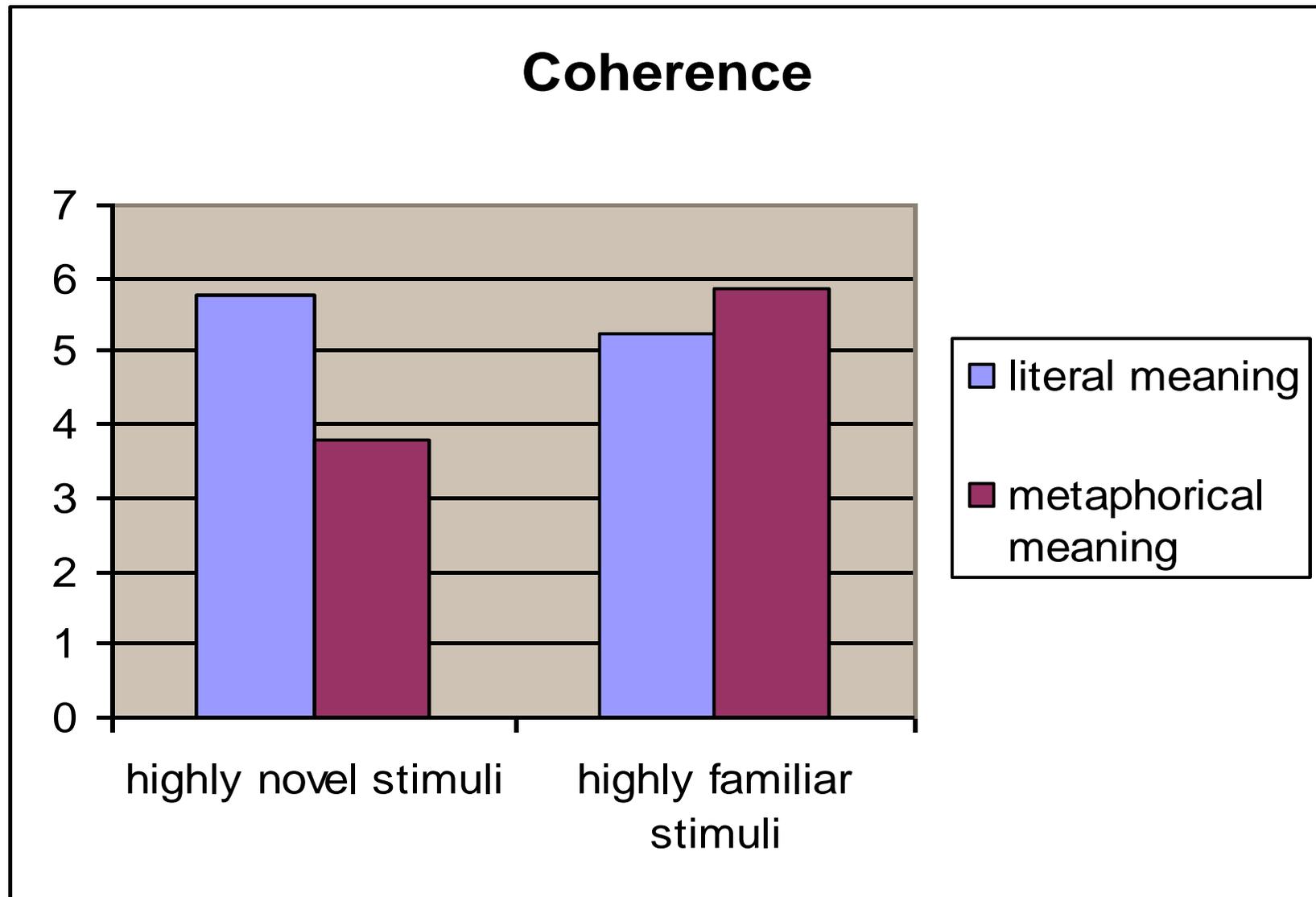
Sharon finished renovating her house. She put a lot of thought into designing the different rooms. She says she's very pleased, but the only thing that is still missing for the living room to look perfect is

**a geometrical abstract painting.**

# Coherence ratings of high familiar and high novel metaphors

( $t_1(57)=5.31, p<.0001$ ;  $t_2(19)=2.42., p<.05$ )

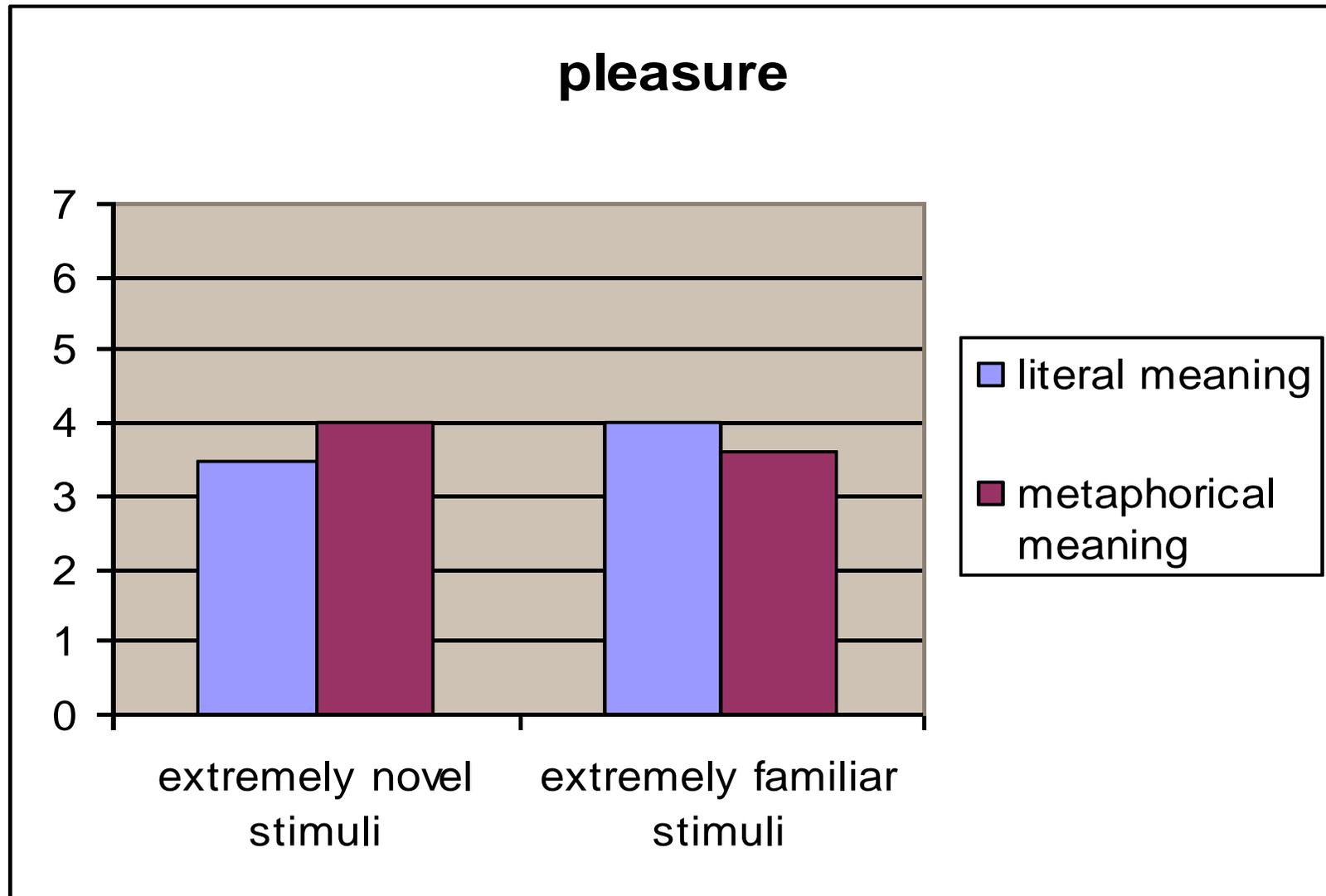
( $t_1(57) = 15.60, p < .0001, t_2(19) = -7.37, p < .0001$ )



# Pleasure ratings of the 10 most familiar and the 10 most novel Metaphors

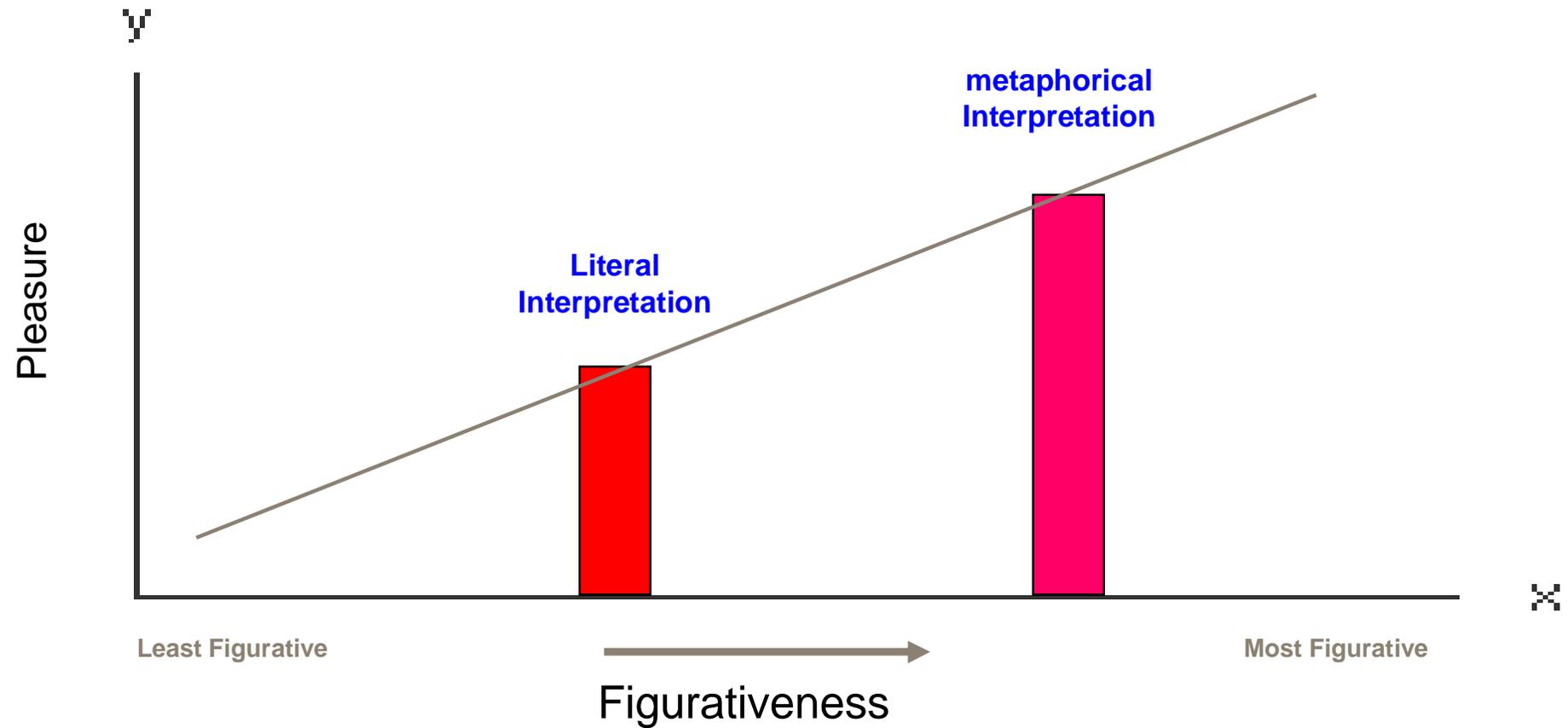
$(t_1(53) = 2.31, p < .05, t_2(9) = 2.35, p < .05)$

$(t_1(53) = 2.31, p < .05, t_2(9) = 2.35, p < .05)$



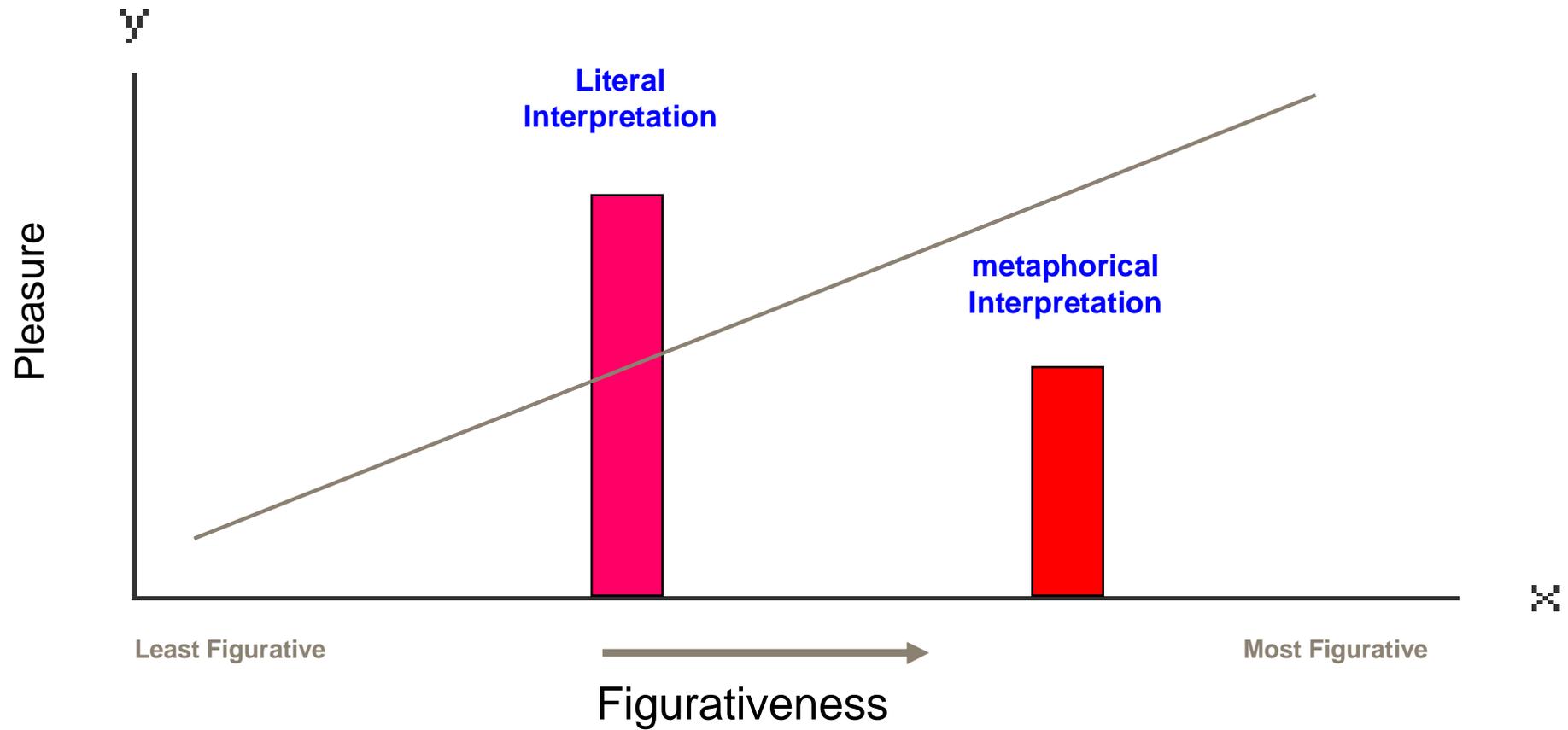
# Figurativeness effect?

Highly Novel  
Metaphors



# Figurativeness effect?

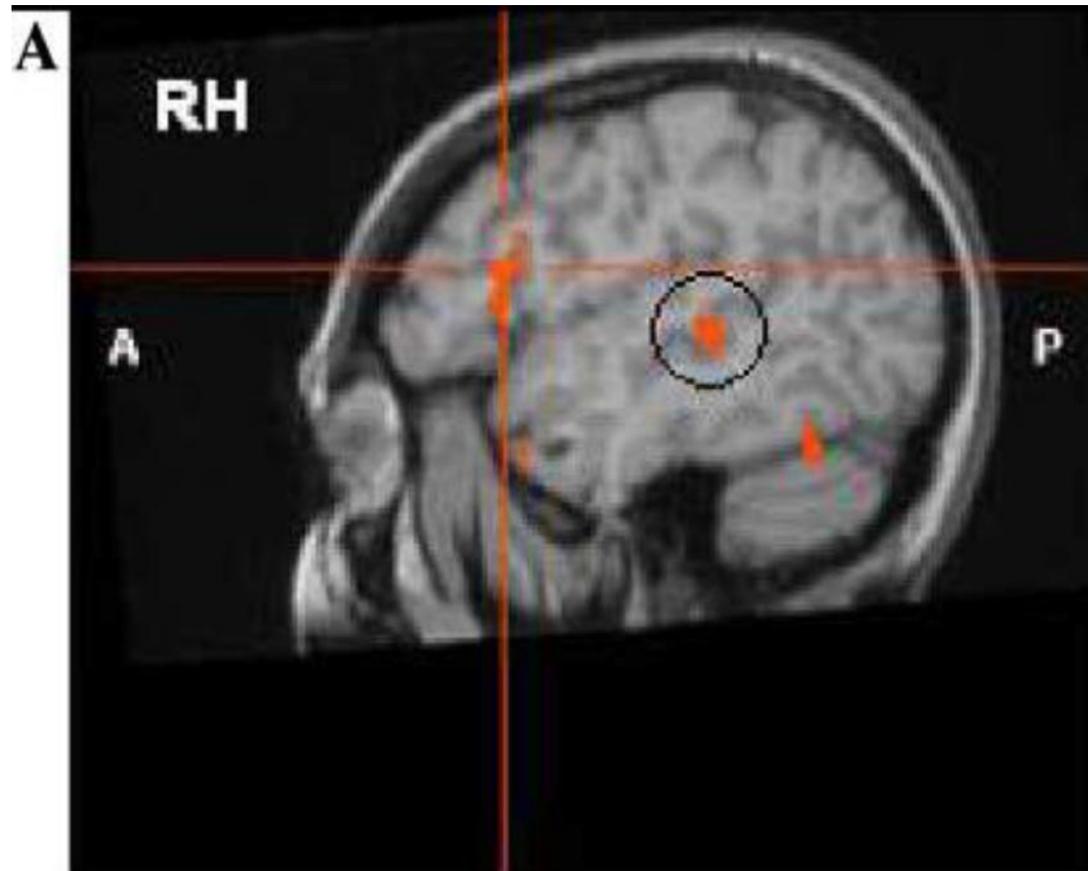
Highly Familiar  
Metaphors



**Pleasurability is  
sensitive to  
Optimal Innovation  
rather than to  
figurativeness**

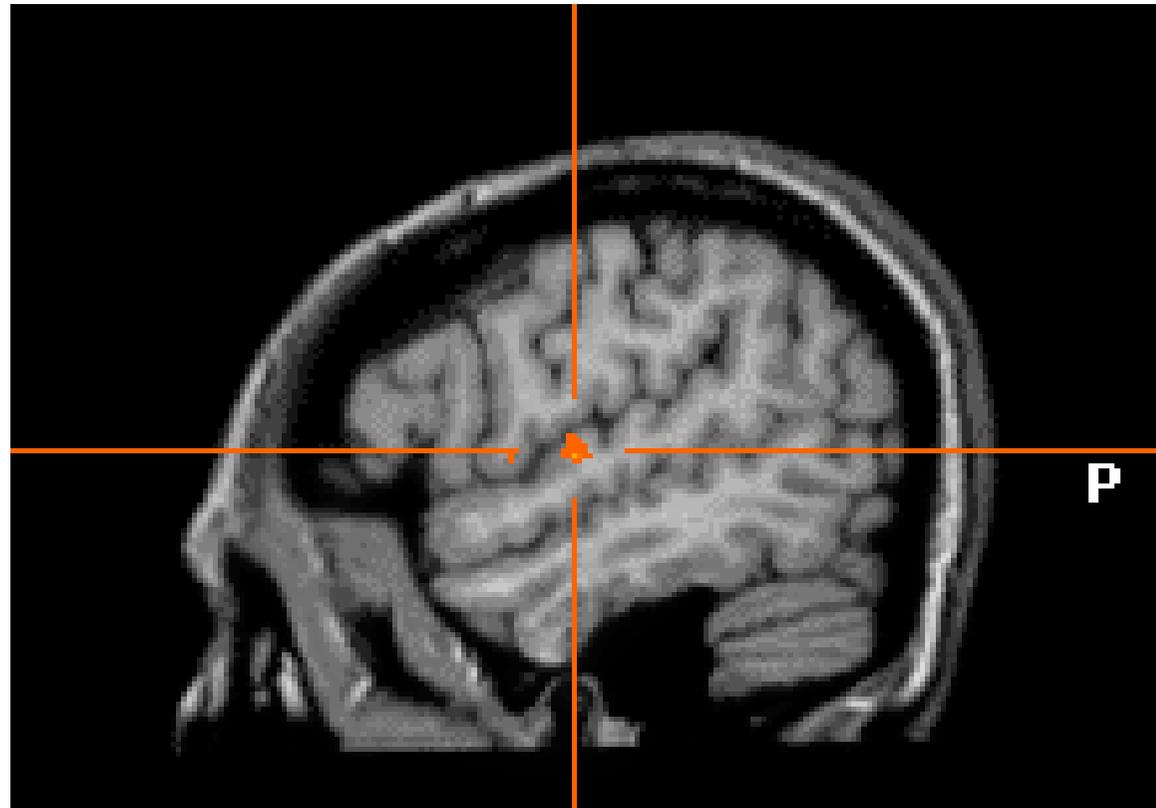
# Metaphorical interpretations of novel metaphors are processed in RH areas

(Mashal et al., 2005, 2007)



# Literal interpretations of familiar idioms are processed in RH areas

(Mashal et al., 2008)



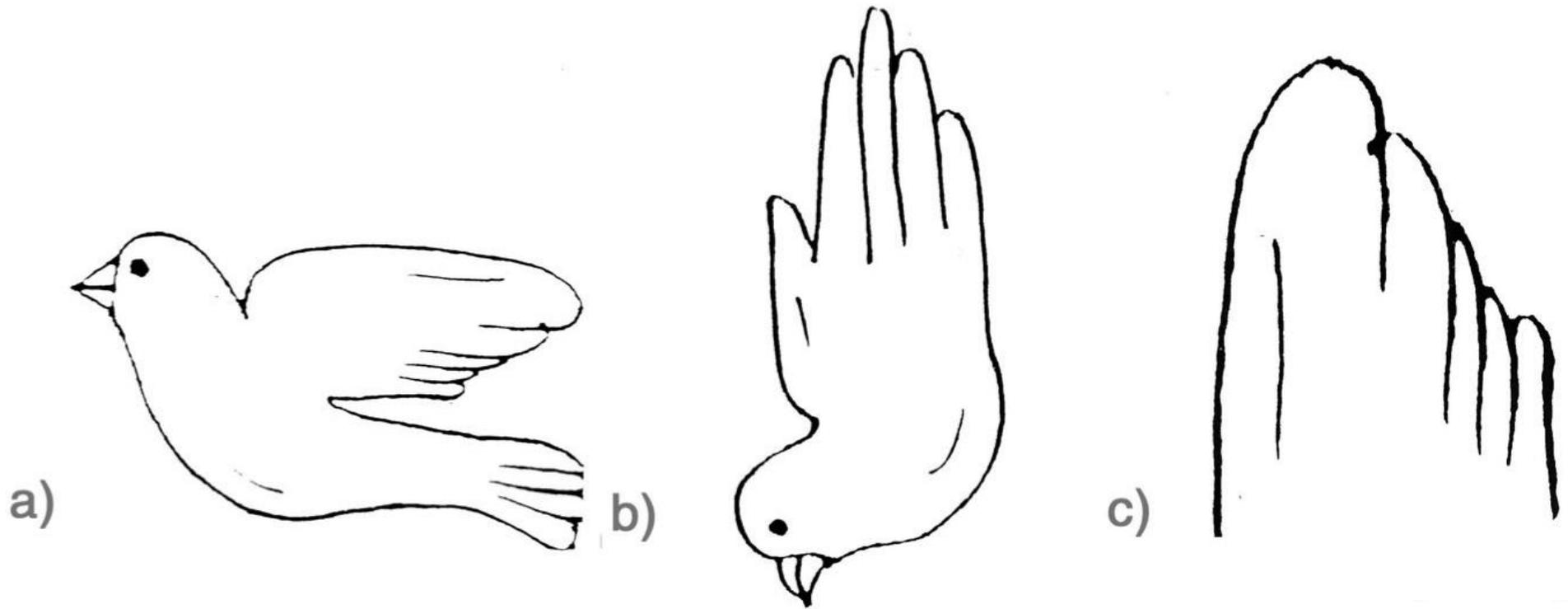
**What matters, then,  
is not figurativeness or  
lack of it**

**but**

**Optimal innovativeness**

# Experiment 6

## Pictorial stimuli



# Revising Aristotle?

We all naturally find it **agreeable** to get hold of new ideas easily...

Strange words simply puzzle us; ordinary words convey only what we know already **[?]**; it is from ~~metaphor~~ **Optimal Innovation** that we can best get hold of something fresh.

# Optimal Innovations vis à vis non/literalness

**Body and sole** / **Body and soul** (L-L)

**Know hope** / **No hope** (L-L)

**Curl up and dye** / **Curl up and die** (L-M)

**A peace of paper** / **a piece of paper** (M-L)

**Weapons of mass distraction** / (M-L)

**Weapons of mass destruction** / (L)

**Weapons of mass construction** (M-L-M)

# Conclusions

**Pleasurability  
is sensitive to**

**Optimal Innovation  
(rather than to  
figurativeness)**

**Food for future thought:**  
**Are optimal innovations**  
**always more pleasing?**

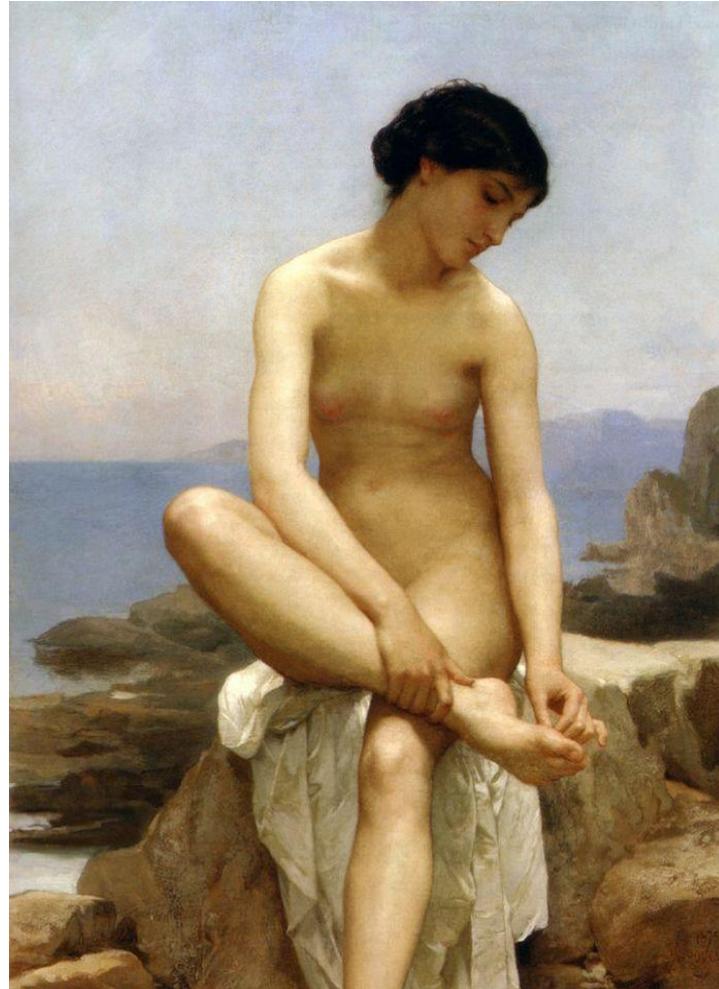
**Affect and Pleasure**

# Wonder Woman



# Bather

## William Bouguereau (1879)

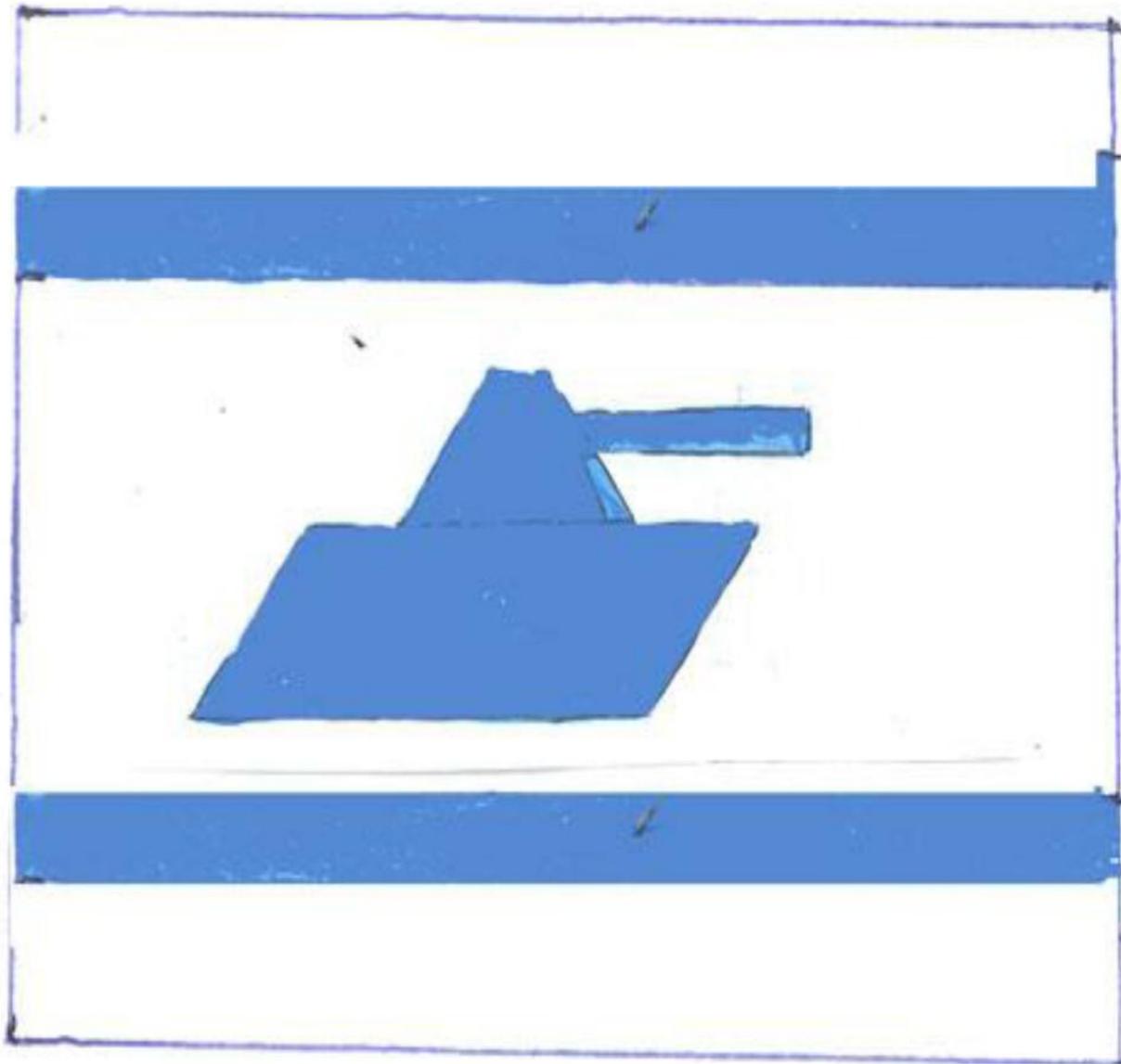


## Lahav Halevy's (2002)



# A new design for the flag of the state of Israel

Shimon Tzabar 2002 <http://oznik.com/art/gallery/020902.html>



# The flag of the state of Israel



**Thank you!**

