Optimal Innovation
Creative Interpretations of
Literal and Non-Literal
Language

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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:

nobody
Write the word that's the opposite of the following words: nobody yesbody
Write the word that's the opposite of the following words:

nobody

yesbody
Lorenzo Gatti’s example

“Oil on canvas”

“Hopefully we can clean it”
Save our soles
Save our souls

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SAVE OUR SOLES

These are the surviving shoes of 'dog poo incidents'. To stop innocent shoes being cut down in their prime, please pick up after your dog.
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)
Protesting the Israel Philharmonic Orchestra in NY (Oct 29 2013)
Swan Lake ballet parody
Les Ballets du Trockadero

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


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
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


- 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 \((\text{Yesbody})\) alongside

(b) a coded \textbf{salient} response \((\text{Nobody})\) from which, however, it differs (both \textit{quantitatively} and \textit{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 pleaurability 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 pleasurable ability and degree of familiarity.
Results

![Bar chart showing ratings for Familiar expression, Variant version, Optimal innovation, and Pure innovation. The chart compares Familiarity and Pleasure across different categories.](image)
Wundt’s Curve (1874)
Monotonic increase of pleasure

FIG. 1. Wundt Curve

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

<table>
<thead>
<tr>
<th>Low Complexity</th>
<th>Medium Complexity</th>
<th>High Complexity</th>
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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

[Graph showing pleasure ratings for Salient, Optimally innovative, and Irrelevant]

[Graph showing reading times for Salient, Optimally innovative, and Irrelevant]
How will metaphors fare with regard to pleaurability 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.
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?”

After tasting Barak’s pita bread, Keren said:

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

Coherence

Coherence ratings for novel and familiar stimuli, comparing literal and metaphorical meanings.
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

Literal Interpretation

metaphorical Interpretation

Pleasure

Least Figurative

Figurativeness

Most Figurative
Figurativeness effect?

Highly Familiar Metaphors

Literal Interpretation

metaphorical Interpretation

Pleasure

Figurativeness

Least Figurative

Most Figurative
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

a)  
b)  
c)  
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)

Sharon

Stone
A new design for the flag of the state of Israel
The flag of the state of Israel
Thank you!