## From art to information system

Evaluation of Art:  $P=(a \times p)^{-i}$ 

Miro Brada



This insight to art came from chess composition concentrating art in a very dense form. To identify and mathematically assess the uniqueness is the key applicable to other areas as programming, social media, energy costs, pricing of art. Maximization of uniqueness is minimization of entropy that coincides as well as goes beyond Information Theory (Shannon, 1948). Reusage of logic as a principle to minimize entropy, requires simplified architecture and abstraction. Any structures (eg. plugins) duplicating or dividing functionality increase entropy and unreliability (eg. British Airways IT system). These ideas were verified by my chess compositions, art works and information system as an author of each.co.uk, and presented at conferences in Santorini, Adelaide, Geneva, Daejon and virtually.

A cave man



# Imitation: thing $A \times its$ depiction $(A) = A^2$

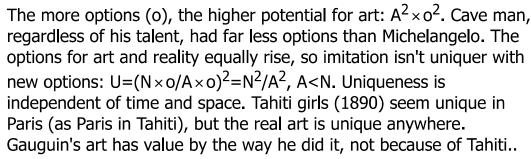
Art is a series of 2 or more units. A cave horse is a series of (1) real, and (2) depicted horse. The realistic imitation is 1st criterion: the more real, the uniquer. series's unit  $\bf A$  has value  $\bf A^2$ . The cave horse is less real than Michelangelo's David. But the cave man had worse tools. Since invention of photo (1826) to imitate is trivial: take a pic, but do better tools lead to better art?

#### Michelangelo



**David, 1501** 

## Options or oddity can't make art uniquer





**Paris** 



Tahiti

**Parmigianino** 



Long neck, 1535

## **Deviation is temporarily uniquer**

Deviation adds option to imitation. The long neck of 1st known manneristic work, is realistic imitation just intentionally extended (=new option o). Since all can be longer:  $N \times o$ , it's only temporarily uniquer until all options are exploited. H. Bosh deviates in proportions  $o_p$  in odd context  $o_o$ :  $o_p \times o_o$ .. Impressionists deviate by blurring  $o_b$ , Warhol in colors  $o_c$ .. The deviation includes imitation referring the reality, otherwise it's random (pseudo-deviation) and can't be unique, eg. abstract 'art' can be anything (A=N): U=N/N=1.



*N*arhol, 1967



Bosh, 1510

Monet, 1871



**Impression Sunrise** 

### **Probability of Art**

Uniqueness U or inverted probability (frequency) defines art:  $U=N/A=p^{-1}$ ,  $p\in (0,1)$ . Invention o enhances both art  $A\times o$  and reality  $N\times o$ :  $U=N\times o/A\times o=N/A$ . But 1st new option is: N\*o/(A+1), 2nd: N\*o/(A+2).. So next art of the same option is more likely: less unique. The 1st impressionism *Le Déjeuner sur l'herbe* (1863, Manet) or *Impression, Sunrise* (1872, Monet), or 1st cubism: *Les Demoiselles d'Avignon* (1907, Picasso) are uniquer than next impressionism / cubism. As marginal utility in economics: 1st thing is valued more than next one.

But 1st movie Roundhay Garden (1888) in 1.66 seconds, isn't uniquer than later movies by Chaplin or Fellini.. It is because La Dolce Vita in 7 episodes (174 mins) has new options to differ far more than paintings among paintings. New art  $a_n$  with probability  $p_n$  enhances the reality N to

Roundhay Garden



La Dolce Vita

decrease other arts' probabilities by (1-p<sub>n</sub>):  $\sum_{n=1}^{n} \mathbf{p}_{n} = \mathbf{1}$ ,

while it increases probabilities of existing arts - if it leapfrogs their uniqueness. Eq. Sotamayor has held the record high jump 2,45 m since 1993, and his record is uniquer by time with still new jumps. But if a new jump overcomes 2,45 m, the Sotomayor's jump will become less unique (more likely). The probability of the top rank depends on the size of the set, as eq. 9th of 100 (.9) is uniquer than 1st of 10 (.1). That's why the top movie is uniquer than top painting, because movie as a set of static pics is far bigger set than set of all paintings. Likewise impressionism and cubism are on average uniquer than classic painting, as they enhance the set of paintings by extra option o. The quality determines the rank: a banal or technically bad cubism (=lower rank) isn't better than Vinci. But top cubism eg. Picasso's *Le Rêve* is uniquer than eg. Vinci's *Mona Lisa* (1503), as it's at the top within a bigger set. It doesn't mean Vinci couldn't do or invent cubism - if born later, it's a comparison of the products. Intricacy is a criterion to assess the rank of art. Eq. are Duchamp's readymades (objects isolated from their intended use) eq. Fountain (=toilet) uniquer than cubism? Already Bosh used 'readymade', Duchamp just isolated it in a 'test-tube'. Set of 'readymates' is huge (almost anything), but it isn't uniquer than other art as its probability is almost random ( $\approx$ .5) without criteria to differentiate as it's easy to do / repeat. Anyone can do "readymade" a la Ray or Hirst, while the few can do a somersault. M. Vazquez did the 1st 4x somersault on the flying trapeze

## **EASY (almost random) TO DO**

# Duchamp, 1917





**Shark in formaldehyde** 

#### **DIFFICULT**

M. Vazquez, 1982 quadruple (4x)



in 1982, H. Song did the 1st 5x one in 2013. A somersault is harder / uniquer than average art, but although the 5x somersault is uniquer than maybe 99% of art, the top art is uniquer as it is far bigger set. But what's top art? Is it Girl with a Pearl Earring that is more famous than H. Song's somersault? It became more famous since its promotion (2012) that is unrelated to the quality (anything promoted is more famous). So the fame isn't reliable criterion. What are other criteria? Yashenko jumped the record 235cm in 1978, by straddle. Sotomayor set it to 245cm in 1993, by flop. Deducting the jumper's height, Sotomayor (193cm) ends 5th, Austin (183cm) 1st. So the

J. Sotomayor, 1993



245 cm (flop)

#### Jump minus jumper's tall

1 Austin	240-183	=5/
2 Matei	240-184	=56
3 Conway	239-183	=56

243-189 4 Barshim

**5** Sotomayor 245-193

highest doesn't need to be the uniquest. 5x somersault is V. Yashchenko, 1978 at the top of somersaults, while Girl with a Pearl.. is high but probably not the top as there are other comparable products: Mona Lisa (1503), Las Meninas (1656).. A somersault can be forward, backward, sideways. A high jump can be scissors, roll, straddle, flop. Forward and flop jump the heightest. Straddle (235cm) and flop 245cm differ less than *forward* and *reverse*: somersaults vary less than the high jumps, and paintings having many styles vary more. Set of somersaults  $N_s$  < jumps

 $N_i$  < paintings  $N_p$ . The bigger set N the

- lower probability of the top art p<sub>n</sub>=1/N
- more variants and criteria to assess the top art.



235 cm (straddle)

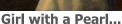
#### Top jumps (outdoor)

- **1** Sotomayor 1993 245
- 2014 243
- 2 Barshim
- 3 Bondarenko 2014 242
- 4 Sjöberg 1987 242
- **5** Paklin 1985 241

New art  $\mathbf{a_n}$  with probability  $\mathbf{p_n}$ :

- decreases probabilities of all arts by  $1-p_n$ , when:  $\sum_{n=1}^{n} p_n = 1$
- increases probability  $\mathbf{p_x}$  of  $\mathbf{art_x}$  if it is uniquer:  $\mathbf{p_n} < \mathbf{p_x} \Rightarrow \mathbf{p_x} \uparrow$ . Eg. When Sotomayor (1988) jumped 243, overcame Sjöberg's (1987) 242 that became less unique. When M. Barshium (2014) jumped 243, Sotomayor's 245 became uniquer, but Sjöberg's 242 less unique again.
- decreases the difference  $\Delta_{a-b}$  between arts:  $a_a$  and  $a_b$  if they are both less or more probable than  $a_n$ :  $(p_a < p_n \land p_b < p_n) \lor (p_a > p_n \land p_b > p_n) \Rightarrow \Delta_{a-b} \downarrow$ . Sotomayor's 245 made all previous jumps less unique, and diminished the differences among them. A difference  $\Delta/N$ becomes  $\Delta/(N+1)$ . It is true for a smaller jump too: all differences among the higher jumps becomes smaller:  $\Delta/(N+1)$ . Or internet covering all previous arts diminished the differences not only among paintings but also among paintings and movies or literature...









 $\approx$ 



**SpaceX, 2008** 



Gagarin, 1961

There are less space flights  $N_f$  than movies  $N_m$ , but the space flight is a top of various industries: engineering, material, automation..:  $N_f = N_e^* N_m^* N_a$ .. far bigger than  $N_m$ . Is uniquer 1st space flight (1961), moon landing (1969), Falcon 1 (2007), or Chinese robot on Moon's dark side (2019)? Moon landing reached further and could be uniquer than 1st space flight, Falcon 1 was uniquer only by criteria irrelevant to the result: reusability or private funding. And 'reusability' was dubious as well as funding when the US Department of Defense paid the launches. Many other criteria cen be considered eq. very damaged (WW II) Soviet Union had less people than USA...

## **Economy and Relevance:** A $\downarrow \Rightarrow$ U $\uparrow$



**Pointed toes** 

Any extra unit in chess composition is removed to maximize aesthetics - it's called economy. Why do gymnasts point their toes, or programmers optimize codes (eg. minimize loops)? The pointed toe is just one (uniquest) of many positions. Extra loops or duplications are hard to reuse to cost more resources. The economy minimizes the solutions  $\mathbf{A} \downarrow$  to raise uniqueness:

 $U=p^{-1}$ , p=A/N:  $A \downarrow \Rightarrow U \uparrow$ . A performance itself enforces the economy: a top high jump can't be uneconomical (eq. jump

D.Vassiliev, 2015

Longest jump 254m with a crash

with waving). Anything extra to perform / express un idea is uneconomical  $A\uparrow \Rightarrow U\downarrow$ . Landing's quality matters in a ski jump, but not in a high / long jump. Vassiliev ski-jumped 254m to crash, and so S.Kraft's 253.5m without a crash is the longest. By other criteria, shorter jumps can be at

Rorschash, 1921



hands, legs oligophrenic detail

the top. In football a ball hitting the pole can be 1/2 goal.. In Rorschash test 'oligophrenic detail' is an answer describing parts of the whole (eq. hand / leg of body) or the inkblot's parts. It's more often in mental disability less capable to recognize relevance / whole. Eq. dress colour is irrelevant to a performance. It can have a minor role in figure skating, but the intricacy or style is far more relevant. In painting the colour matters as well as shapes, composition, lines. But it



**Drawing Hands** colour irrelevant

matters more in eg. expressionism to show emotions than eg. in Escher's illusions.

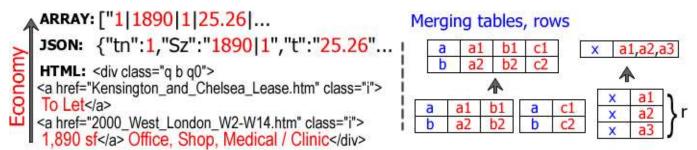


The Scream colour relevant

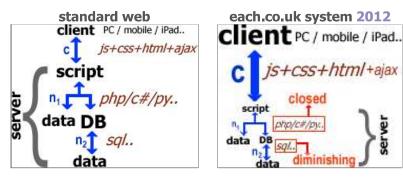
In 2007, I started working on each.co.uk server-side ASPX system with little re-usage, repeated outages, slowness, sessions cut off. In 2012, I was let to build an economical system independent of server, plugins, 3rd party to cut:

- server's operations n for N users: N \* n ↓ (n≈0)
- data (**d**) structures (**H**) sent from the server:  $\mathbf{H} * \mathbf{d} \downarrow (\mathsf{H} \approx 1)$ Server's  $\mathbf{N} * \mathbf{n}$  operations transmitting huge html data  $\mathbf{H} * \mathbf{d}$ , were moved by javascript **js** single-page (SPA) to browsers using jsons / arrays. SQL subtables ( $t_1, t_2...$ ) and extra rows ( $r \uparrow$ ) multiplying operations  $n \uparrow (t_1: r * t_2: r...)$  to load data, were merged ( $n \downarrow$ ) and less interrelated SQL data (views, histories...) moved to simple files. It ended the outages, cut offs. Mere 5 KB closed (no changes) php replaced 2 MBs C# dll. **Js** replaced SQL jobs, dates, ids, emails.

Eg. SQL 17. Oct 2022 09:01:33⇒220917090133 YYMMDDHHMMSS⇒MJH91X (M=22,J=09..) YMDHMS.



Client's (C) **js** moves as well as cut the server's operations  $n_1 \approx 0$  (php),  $n_2 \approx 0$  (SQL), as the fragmented codes  $n_1$ ,  $n_2$ ,  $n_x$ .. duplicate logic more likely:  $\Delta C <= \Delta n_1 + \Delta n_2$  ( $\Delta = \text{change}$ ).



That's why **js** libraries or frameworks have appeared: jQuery (2006), Angular (2010), React (2011), Vue (2014), AngularJS (2016).. with prepared functionality to hasten development, but fragmenting the code ( $c_1$ ,  $c_2$ ..) to limit flexibility, speed, transparency.. The real upgrade is WebAssembly (2015) running the compiled code in the browsers to

overcome **js**'s speed and security. The economy is as Occam's razor (14 c.): "entities should not be multiplied beyond necessity". It's implicit eg. a somersault can't be done with funny (=unneeded) moves, but the relevance is trickier. M.Powel jumped the record 895cm to crash, while D.Vassiliev's **Bob Beamon, 1968 Carl Lewis, 1991 Mike Powel, 1991** crash annulled his record ski-jump 254m. The



wind 2.0, no crash wind 2.9, no crash wind 0.3, a crash

crash annulled his record ski-jump 254m. The long-jump landing varies little to be scored and its crash can't prolong it (=is irrelevant), while the ski-jump landing and flight vary enough to be scored, and the crash can prolong it (is relevant). So the relevance is a product of a necessity and a rule eq. a misstep annuls the

long-jump, 2+ meters wind annuls the record (C.Lewis's 891cm).. In football the goal is by a foot, no foul / offside, gate's size 7.32\*2.44 m.. No doping and fair play are general. The score (length, style, goals..) has multi-values:  $s \in \{0,n\}$ , the rule has false or true:  $r \in \{0,1\}$ . Uniqueness  $\mathbf{U} = \mathbf{s_1}*...\mathbf{s_x}*\mathbf{r_1}*...\mathbf{r_y}$  (x=number of scores, y=number of rules). Most sports: football, basketball, tennis, jumps, throws, runs have one score (goals, sets, points, size, time..) easily determining winners. Triathlon, decathlon, gymnastics, figure skating or art.. has more scores harder



Sunflowers, 2 of 5 versions

to calculate the best - not because it's subjective or impossible, but due to complexity. Eg. which one of Van Gogh's *Sunflowers* series (1887) or Degas's *ballet dancers* series (1870-1900), is the uniquest? And are the uniquest *Sunflowers* uniquer than the uniquest *ballet dancers* - and why?

Edgar Degas, 1870-1900, Ballet Dancers' series





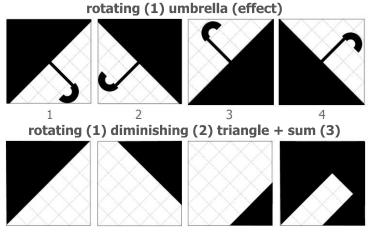






## uniqueness (economy+logic)

In the TIC test, the person draws logical series on 4 patterns. 1st example was adding, 2nd alternating (L-R) rectangle. I tested 600+ people in 1999 to find 24 distinct (also combined) logic



TIC test, 1998, drawn logic..

sometimes with effects eg. meaning (umbrella, face..), eternal (recurring pattern).. The effect adds the intricacy, but is less relevant than logic itself. The umbrella, face, cake, ship, anything can rotate, that is so less unique than rotation (logic). The recursion in shizophrenia can have many contents: God, spies, aliens.. But to understand psychosis the logic (recursion) is relevant not its content. In art, the style (how done) matters, then content. Impressionism isn't defined by flowers, dancers, sea.., but by "blurring" to capture "momentum". By TIC, Blue Dancers is the best of Degas' series, as

it combines impressionism with logic of "rotating" dancers. Although Degas didn't have TIC instruction to 'draw logical series', the artists maximize aesthetics, and the added logic increases uniqueness (aesthetics). *Blue Dancers* is the most economical without unneeded object or much extra space. Again Logic's unit needs an abstraction to be repeated. Cubism simplifies the reality to geometrical abstractions to depict the same object from different views, that is logical series too. Young Escher studied Alhambra's arabic patterns being inspirations for his sketches. He also transformed coastal Atrani via 3D blocks to patterns. Drawing hands (drawing themselves) is like adding TIC's meaning and eternal effects to the arabic patterns. In addition the meaning 'hands' are uniquer than the umbrella or other, as it relates to the drawing itself. So he added sufficient value to the arabic patterns, and his logical illusions went beyond.



MC Escher, Metamorphosis I, 1937

# **WORKING HERE - will continue..**

## Modern Art: $U=p^{-i}$ , i >= 2

Arcimboldo reused things in a thing (Librarian of books) with depictions  $A^2$  powered by  $2:(A^2)^2=A^4$ : uniqueness unachievable by 'classic' deviations - still applicable: Librarian's head can be long, blue.. Or cubism reused the same object  $A^2$  from different positions at the same time to multiply it:  $A^4$ . Dostoyevsky (1888) writes how Jesus returns (phase 2) during the Inquisition, performs miracles to be arrested and burnt the next day. Hitchcock's movie Vertigo (1958) or Psycho (1960) suddenly reverses its meaning (victim is culprit) as info reveals

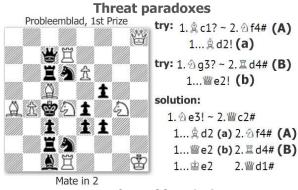


(phase 2). Dostoyevsky and Hitchcock reused the plot A<sup>2</sup> in another plot: A<sup>4</sup>. Both plots remind a threat paradox in chess composition (1958): "The defense enables mate in phase 1 to disable it as a threat in phase 2".









Hitchcock, 1958

Dombrovskis, 1958

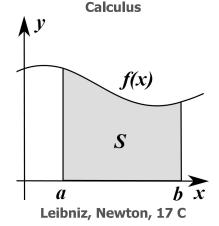
The principle of modern art is the reusage to multiply uniqueness:  $U=p^{-1}$  (A=1/p), with intricacy i >= 2: eq. chess compositions reuse logic in 2, 3 or more phases. The reusage can enforce the form eg. cubism simplifies reality to geometrical shapes possible to reuse. Modern art is a mental gymnastics or figure skating reusing jumps, spins, rhythms.. A somersault or a pirouette itself is a reusage (return to the same point): A<sup>i</sup>, where **i** is number of somersaults. Top performances sum more criteria eg. difficulty (..salchow, loop, flip, lutz, axel), style, precision, and so are uniquer than records with 1 criterion eq. max of somersaults. Gymnastics as art of movements can be eq. ballet (15 century), waltz (18), tango (18), flamenco (18), gymnastics (19), modern diving (19), synchronzied swimming (19), rhytmic gymnastics (20), freestyle skiing (20).. Mental gymnastics is a far bigger physically less limited set: painting, literature, music, movie, chess composition, philosophy, math...







**Music composition** Bach, 16-17 C



England, 18 C

Each art reuses / copies reality. Modern art adds extra layer. Religions reuse the reality in the other world: paradise, hell, karma.., same as Plato's dual worlds. Nietszche's (1887) "eternal return of the same": the life repeating (re-using) itself exactly as it is forever, merges dual worlds to one to recall Parmenides (6 BC): the reality is one. Chess composition is a shortcut to art. Alberto Mari's neostrategy' (1928): game in game, re-used mates in reciprocal change (AB-BA). Mansuba in Persian or

Arabic Empire, was often "study to win", similar to chess. Caliph of Baghdad Al-Mutasim Billah composed 1st known problem (9 C): mate in 9 moves, with "hard to solve" criterion: the trickier, the better. Neo-strategy just added phases to reuse mate, function, motif, defence.. As in art, the new genres (deviations) have appeared eq. selfmate (13 C), helpmate (19 C), or schools as Bohemian model mates, Slovak change of motifs.. I used to compose too, won a few prizes and invented redefinitions of mate (eg. MAFF=mate with a free field). As I was reading (2002) art journals, I realized compositions' definitions could define the art. They deviate from chess - as a gymnast deviates from a run: the aim isn't a speed but a stylish pirouette / composition. The chess composition provides several insights into art.

1x logic

The chess composition provides insight A/N **1**  $_{+1}$  **2**  $_{+1}$  **4** is probability f, o<sub>t</sub>/o is new option probability  $f_{+}$ :  $p_{+} \in (0, 1)$  So: H = (0, 1)



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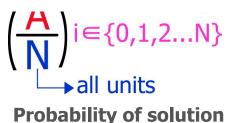
4x logic

2x logic

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IQ series: 1x, 2x, 4x

 $(N \times o/A \times o_t)^i = (p \times p_t)^{-i}$ . By logarithm:  $\hat{U} =$ Ig U =  $-i \times Ig p \times p_t$ . Uniqueness increases linearly by inverted frequency and geometrically by intricacy. The bigger invention, the lower its probability (frequency). The first products of new invention need less intricacy to be equally unique as products with less options: eg: simple movie can be uniquer than intricater painting





Energy costs / economy

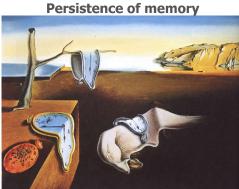
Eg. quad (4x) axel considered hardest of all 4x jumps L.Lacny, 1949 N.Macleod, 1950 Plushenko, 2010 Intricacy i in A<sup>i</sup> can exceed 2: chess compositions reuse logic in 3, 4.. phases. Picasso reuses things in different angles. Chirico, reading Shopenhauer, Nietzsche, translated unknown and solitude to painting, with simplifications reused by Dalí, Ernst..



Picasso, 1932



Chirico, 1916



Dalí, 1931



Max Ernst, 1940

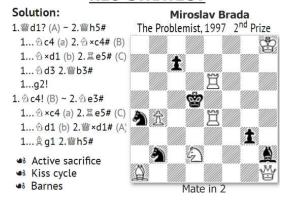
#### Chess composition as an art

Chess composition is a shortcut to art. Alberto Mari's neostrategy' (1928): game in game, is especially impressive coinciding with Arcimboldo's modernity. I was also a composer winning a few international prizes to invent special conditions redefining mate (eg. MAFF=mate with a free field). In 2002, I was reading art journals to realize compositions' definitions could define art. They deviate from chess - as a gymnast deviates from a runner: the aim is not to be the fastest (to win) but to jump somersaults. In Persian and Arabic Empire, they composed 'mansubas', often studies to win, similar to chess. Al-Mutasim Billah (caliph of Baghdad, 833-42) made the earliest known problem: mate in 9 moves. The criterion was "hard to solve": the harder, the better. As in painting or literature, the new genres (deviations) have appeared eq. selfmate (13 c.), helpmate (1854), or schools as Bohemian "model mates", Slovak "change of motifs"... While 'hard to solve' criterion remains, neo-strategy exponentionally increased intricacy by multi-layers reusing logic - mate, function, motif.. My first composition (diagram 1) had a tricky key. B. Formánek, once President of FIDE for chess composition, was sending me journals, taking me 6 months to grasp neo-strategy, an extremely aesthetic experience (other composers said same) - contrary to expectation far more impressive (uniquer) than

#### HARD TO SOLVE



#### **NEO-STRATEGY**



hard-to-solve problems. Diagram 2 is the 2nd prize in Problemist (1997) for a cyclic change (reusage) of key and 2 mates in 2 phases. Formed by chess problems, I made first animations in 2006 in Prague. In my solo exhibition in Holland Park in London (2013), I was showing digital art entitled From Animation with eg. Naomi Campbell combining logical IQ series: decompose, sum, move in move, repetition, or 3-phases' short movie 'Discontinuity'. My art was later exhibited in Germany, Japan. Composition 'Sevilla' is most advanced, 'Modern Art' is a satire of a corruption masking as 'art' being anything even perversion: a fart in



heart, so a gas mask is needed, sold for unreal price.. The market can promote the art as the rise of modern European music after WW II. In 1990s, the Western art market has been gradually (privately) monopolized to cut output / quality and rise price (profit). A real competition was replaced by ads. A qualified feedback to artists, was replaced by 'likes' from social media. Degradation demonstrates a belief that the point of art is to shock by any means or do anything 'first'. In 2014, the famous American singer invited 'artist' that vomits on canvases (='art') to vomit on her as she was singing. It seems 'unique' but anybody can vomit or be vomited, while few can jump a pirouette. So 'vomit' or 'be vomited' is not very unique.





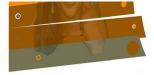














Miro Brada (bit.ly/18CLv6d) exhibiting at the Ice House Gallery @HollandPark\_LDN til Sun - go & take a look!



PAF 12 exhibitor: Miro Brada, "Naomi Campbell". Chelsea Town Hall, London, February 28th -

# 2 pics from Sevilla (2020)



Discontinuity, The New Art Form demonstrating Foucault's philosophy in 3 phases

Miro Brada, Discontinuity, the new Artform (2013)

CLARE O'FARRELL

Miro Brada, Discontinuity, the new Artform

