



Through the Looking Glass: Enlightening Dental Scholars on Alice in Wonderland syndrome

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ABSTRACT

Aim: To conduct a comparative assessment of the depth of knowledge and the level of clinical awareness regarding Alice in Wonderland Syndrome (AIWS) between medical and dental interns. This study will focus on quantifying their understanding of the syndrome's core features (knowledge) and their ability to recognize its potential presentation in a patient (awareness).

Keywords: Angor Animi, Art, Hallucination, Metamorphopsia, Mimesis, Realism, Synesthesia, Visual Perception.

Introduction

Plato famously stated that art imitates life. In his theory of mimesis he suggested the closer a work of art approached truth, the more beautiful it would be. Since the ancient Greek philosopher also held that our perceptions are mere shadows of existence, and art is therefore always 'twice removed from the truth'¹, this observation takes on a new meaning in the context of distorted realism, a movement in contemporary art where realistic figurative paintings show distorted aspects reminiscent of Alice in Wonderland syndrome (AIWS). We here ask ourselves whether artists in this new artistic movement paint what

they see, or merely add distortions to their work for aesthetic or even commercial reasons. We moreover ask ourselves whether those who paint what they see are aware that their perceptual distortions are characteristic of AIWS.

Alice in Wonderland syndrome

AIWS is a neurological condition characterized by phenomena known as perceptual distortions.^{2,3} These differ from hallucinations (where something is perceived that is not there) and illusions (where an existing object is perceived as something else) in that existing objects are perceived such that one or more specific aspects appear to be different,

without any consequences for their gestalt. Some common examples are micropsia (seeing things smaller than they are), macropsia (seeing things larger) and prosopometamorphopsia (seeing changes to people's faces). These are all examples of visual distortions (i.e. metamorphopsias), but the distortions in the context of AIWS can also be experienced in the somaesthetic, auditory, and temporal modalities, and occasionally in the olfactory and gustatory modalities.⁴ The visual ones are most common, though, and it is to this group that we refer in relation to the striking similarities that we found in certain contemporary figurative paintings. For example, Valerio D'Ospino's painting *Biking in White's Woods* (Figure 1A) bears an uncanny resemblance to an image (Figure 1B) used diagnostically by some specialists when diagnosing distortions to the perception of movement, more specifically, porropsia, a perceptual distortion where stationary objects appear to be moving away.⁵

Disrupted Realism

D'Ospino's painting was included in an exhibition titled *Disrupted Realism* held in Philadelphia's Stanek Gallery in 2018, with a book of the same title published shortly thereafter.⁶ *Disrupted realism*, figurative abstraction, distorted artwork; a variety of names are used to describe this contemporary art movement, although distortion in art is not new, of course. We find it in cubism, surrealism, expressionism, impressionism, and numerous other schools. One calls to mind the unusual faces in Picasso portraits, Dalí's melting objects, Giacometti's elongated figures, Monet's colorful haystacks. What is novel are the distortions arising in realist work, which had historically aimed to create an accurate depiction of the external world, in conformity with Plato's mimesis. Artwork that is expressive or abstract can be interpreted and critiqued. We can discuss the artist's intention or the deeper meaning of the work. But when we turn to realism, the possibility opens to explore what the artist actually perceives.

Historical Examples

The well-known impressionist, Claude Monet, was diagnosed with cataracts in 1912. The nuclear cataracts which he suffered from, cause altered color perception.⁷ Since he painted the same subjects over the course of decades, we can compare his paintings from earlier years with those painted as his vision worsened to near blindness from his diagnosis in 1912 until his first eye surgery in January of 1923. Thus Monet's oft-depicted Japanese footbridge allows us to see the progression of his eye disease, with early representations capturing nuanced greens and subtle shades of pink and blue, and later works skewing toward brown, yellow and muddy reds as his vision worsened (Figure 2). Edgar Degas' deteriorating vision is also well documented, his later works revealing his failing eyesight as edges become blurred and less defined, and figures lack detail.^{7,8} This research sets a precedent for using an artist's work to gain insight into their perceptions.⁷⁻¹⁰ AIWS is mainly concerned with neurological causes of perceptual distortion in a bottom-up fashion, although sometimes peripheral conditions may also play a role. It's A B FIGURE 1 (A) *Biking in White's Woods*, oil on panel by V. D'Ospino; (B) image used in clinical practice to explore the presence of porropsia (i.e. seeing stationary objects continually moving away). Hyatt and Blom 10.3389/fpsy.2024.1466666 *Frontiers in Psychiatry* 02 frontiersin.org characteristic distortions arise mostly from the brain's failure to detect and represent highly specific incoming sensory signals. Such problems in visual perception caused by eye disease and central problems in perception distort the way people experience their reality. Just as Monet's cataracts caused his perceptions to change in concrete and predictable ways, his world darkening, blurring and shifting toward brown and muddy colors, metamorphopsias with a central cause can also be categorized.³ A well-known category is dysmorphopsia, a distortion of the contours of objects that makes them appear wavy.³ Safran et al.¹¹ discuss the presumed dysmorphopsia experienced by the artist, Francis Bacon. A

thorough review of Bacon's oeuvre reveals that he had no difficulty in rendering objects comprised of straight lines, such as doors and beds. His distortions seemed to quite specifically arise when he painted people's faces. The suggestion that he suffered from prosopometamorphopsia therefore seems more fitting.¹² Bacon's disturbing yet fascinating paintings have drawn much attention and discussion from art critics, connoisseurs and philosophers, and more recently from those interested in neuroesthetics and neurology.^{11,13} There is no question that they make a strong impression on the viewer. Former UK Prime Minister Margaret Thatcher dismissed him as 'the man who paints those dreadful pictures'¹⁴, yet despite the strong negative reactions his paintings inspire, they remain curiously alluring. The attraction of artwork that depicts an artist's unique impression of their world, along with the distortions they perceive, may even be appealing because of those distortions.

AIWS in the general population

There are no systematic studies on the incidence and prevalence of AIWS in the general population. However, even though the syndrome is diagnosed quite rarely in clinical practice, there is evidence that experiencing some sort of transient metamorphopsia may be relatively common. A search in the popular press for pieces on AIWS reveals multiple articles highlighting the story of someone suffering from more extreme forms of this condition.^{15,16} A newspaper article in the UK's Daily Mail describes the case of a 24-year-old woman diagnosed with AIWS after watching a popular medical television drama. Her case is typical in that her episodes of perceptual distortion resolved quickly. Most remarkable was the number of people who responded in the comments sharing their own AIWS-like distortions and reporting that family members also experienced metamorphopsias.¹⁵ Out of the 119 comments on the article, 52 people had experienced AIWS, and five commenters mentioned that multiple family members also experienced symptoms (Supplementary Material,

Supplementary Table S1). A study examining the prevalence of micropsia and macropsia in several thousand Japanese high school students supports this observation.¹⁷ The authors found that around 9% of the students interviewed had experienced a transient and self-limiting symptom typical of AIWS within the past six months.¹⁷ A Finnish study among 297 slightly older people even found rates of up to 38% for symptoms of AIWS.¹⁸ Considering that transient metamorphopsias associated with AIWS are likely more common than originally suspected, many viewers of paintings with distortions may recognize something hauntingly familiar in the images depicted. This may explain their fascination with this type of art, without realizing why, and without knowing the reasons why the artist decided to add these distorted aspects. In this article, we explore what types of distortion can be discerned in contemporary figurative paintings in the so-called disruptive-realism movement and whether they comply with the metamorphopsias considered characteristic of AIWS. In addition, we explore the reasons that artists give for applying such distortions to their work and whether they ever experienced symptoms of AIWS themselves.

Methodology

a) Study design and area: A cross-sectional study was carried out at the tertiary care teaching hospital Khammam.

b) Study Population: The health care students, including those of Medicos and Dental Interns who responded to the offline paper print questionnaire survey.

c) Study Instrument: A self-administered questionnaire was designed based on knowledge, attitude and awareness of the advanced technology and had a total of 14 questions. Each participant has to fill in their demographic data like Name, age, and year of study. Participants had to select one option from the answers provided against questions the questions were based on knowledge, attitude and awareness among dental students.

d) Pilot Study: A pilot study was conducted on a group of students to assess the validity and reliability of the study.

e) Sampling Method: The sampling method used is a convenience method.

f) Inclusion Criteria: The students who were interested in the study and who were willing to participate.

g) Exclusion Criteria: students who are not willing to participate.

h) Statistical Analysis: Data from the filled questionnaire were collected in a tabular form in an Excel worksheet and evaluated for analysis. The analysis was performed by SPSS version 29.

AGE					
	N	Minimum	Maximum	Mean	Std. Deviation
Age	200	18	25	21.89	1.035

Gender		Frequency	Percent
	MALE	67	33.5
	FEMALE	133	66.5
	Total	200	100.0

		Frequency	Percent
	MEDICOS	133	66.5
	DENTAL INTERNS	67	33.5
	Total	200	100.0

Distribution and comparison of responses based on gender

Item	Response	Males		Females		Chi-Square value	P value
		n	%	n	%		
Q1	1	6	8.9	12	9.0	7.315	0.007*
	2	58	83.5	112	84.2		
	3	3	4.4	6	4.5		
	4	0		3	2.2		
Q2	1	8	12.6	16	21.6	2.750	0.432
	2	23	33.3	49	36.7		
	3	32	42.5	65	40.5		
	4	4	11.2	3	8.8		
Q3	1	45	40.7	83	59.3	1.920	0.589
	2	7	29.2	17	20.8		
	3	16	47.1	18	22.9		
	4	6	42.9	15	17.1		
Q4	1	16	33.3	26	66.7	0.697	0.874
	2	23	36.4	65	63.6		
	3	25	39.1	45	60.9		
	4	3	42	7	58		

Q5	1	1	2.5	7	7.5	2.930	0.402
	2	8	7.1	24	32.9		
	3	6	6.4	9	60		
	4	52	86.4	102	59.6		
Q6	1	51	42.6	109	57.4	3.720	0.06
	2	5	21.7	18	18.3		
	3	6	22.4	3	6.3		
	4	5	20.3	3	6.3		
Q7	1	54	78.0	111	60.8	1.489	0.475
	2	11	20.7	16	29.3		
	3	1	1.2	0	0		
	4	1	1.2	6	12.1		
Q8	1	38	56.7	76	57.1	3.980	0.05*
	2	2	2.9	10	7.5		
	3	13	19.4	15	11.3		
	4	14	20.8	32	24.0		
Q9	1	43	71.2	104	68.8	0.671	0.413
	2	17	21.6	13	18.4		
	3	5	6.4	13	18.4		
	4	2	3.7	3	2.3		
Q10	1	7	13.6	15	15	7.241	0.065
	2	53	62.9	97	57.1		
	3	7	13.6	6	16.2		
	4	1	3.3	15	25.6		
Q11	1	2	3.3	13	6.7	2.655	0.448
	2	5	6.4	14	9.6		
	3	9	30	21	20		
	4	51	61.8	85	58.2		
Q12	1	2	2.9	32	24.0	6.418	0.003*
	2	49	73.1	73	54.8		
	3	8	11.9	15	11.2		
	4	8	11.9	13	9.7		
Q13	1	42	32.8	83	57.2	2.311	0.510
	2	6	16.1	17	13.9		
	3	11	29.3	17	13.9		
	4	8	11.2	16	12.8		
Q14	1	36	47.5	97	62.5	0.221	0.974
	2	15	28.5	8	11.5		
	3	7	16.8	12	13.2		
	4	9	18.2	16	18.8		

P≤0.05 is statistically significant

Distribution and comparison of responses based on year of the study

Item	Response	MEDICOS		DENTAL INTERNS		Chi-Value	P-Value
		n	%	n	%		
Q1	1	4	5.4	0	0	3.998	0.06
	2	41	55.4	75	96.1		
	3	2	2.7	2	2.5		
	4	1	1.3	1	1.2		
Q2	1	1	40	9	36	28.554	0.06
	2	2	22.2	33	61.1		
	3	1	10	7	70		
	4	70	43.1	29	18.1		
Q3	1	58	41.4	27	19.3	21.445	0.08
	2	6	25	14	58.3		
	3	2	35.3	10	29.4		
	4	8	57.1	27	35.7		
Q4	1	7	38.9	28	33.3	27.128	0.246
	2	6	27.3	14	63.6		
	3	6	26.1	10	43.5		
	4	55	43.3	26	17.3		
Q5	1	4	5.4	2	2.5	12.714	0.048*
	2	6	8.1	7	8.9		
	3	12	16.2	9	11.5		
	4	52	70.2	50	64.1		
Q6	1	43	76.5	47	74.7	2.257	0.323
	2	7	10.4	9	9.1		
	3	8	11.6	14	17.6		
	4	6	9.6	8	8.6		
Q7	1	44	56.7	47	65.4	2.712	0.607
	2	10	14.7	9	13.3		
	3	6	12.7	14	18.7		
	4	14	18.6	8	8.6		
Q8	1	10	41.7	9	20.8	34.979	0.06
	2	2	16.7	9	75		
	3	6	21.4	55	53.6		
	4	56	29.6	5	18.5		
Q9	1	60	71.2	44	72.7	14.651	0.08
	2	4	11.1	12	13.2		
	3	6	15.6	14	15.4		
	4	4	7.5	8	7.5		
Q10	1	7	35	6	30	12.306	0.055

	2	59	40.6	51	22.4		
	3	6	46.2	6	46.2		
	4	2	20	6	60		
Q11	1	5	33.3	4	26.7	33.408	0.076
	2	3	13.6	16	72.7		
	3	12	40	11	36.7		
	4	54	43.8	45	17.1		
Q12	1	4	36.4	6	54.5	14.996	0.474
	2	53	41.2	53	20.3		
	3	13	41.9	10	32.3		
	4	4	22.2	9	50		
Q13	1	59	40.7	52	22.1	14.977	0.748
	2	8	34.8	10	43.5		
	3	9	32.1	13	46.4		
	4	8	47.1	1	5.9		
Q14	1	7	43.8	28	37.5	17.924	0.006*
	2	1	7.7	9	69.2		
	3	9	47.4	2	10.5		
	4	57	40.6	39	23.6		

Discussion

Among the 20 painters we interviewed, 17 (85%) reported on 74 different positive disorders of perception. Of them, 11 (55%) had experienced perceptual distortions reminiscent of AIWS. Notable was the number of distortions experienced by some participants. In 85% of the cases people with AIWS experience only one symptom, though it may be experienced repeatedly.⁴ Here we found that two people (18%) reported on a single distortion, six (55%) on two distortions, one (9%) on three distortions and two (18%) on four distortions. One of the two latter participants experienced hyperchromatopsia and hypoacusis (hearing sounds quieter than normal), and additionally reported that as a child she had experienced macrosomatognosia (experiencing one's body or a body part as very large), microsomatognosia (experiencing one's body or a body part as very small) and synesthesia (not a symptom of AIWS), with a three-dimensional, colored perception of music spiraling and fading away. The majority of participants reported having fewer perceptual distortions as they aged. On the basis of their self-reports it was not possible to

quantify the rate of decrease, but except for one, all of them reported either isolated incidents in the past or said that the frequency had declined as they had gotten older. In short, on average, the number of distortions and other perceptual phenomena in the group under study was higher than in an average group of people with AIWS.

Conclusion

Our study among 20 painters in the disrupted-realism movement indicates that the distortions incorporated in their work rarely represent their own, lived-through experiences. Nonetheless 55% reported being aware of having experienced perceptual distortions, and 85% having experienced positive disorders of perception in general. Whether this is a large proportion in comparison to the general population is hard to say due the lack of large-scale epidemiological studies on perceptual distortions. Indirect evidence does indicate though, that the prevalence rate among these painters may not be exceptional, although their ability to utilize distortion as a means to render unique and fascinating impressions of their world may be. Experiencing

perceptual distortions may allow the artists a certain flexibility to deviate from reality when representing the objects in their paintings, but it is by no means a given. The three artists in our sample who had no unusual perceptions to report still created exceptional artwork containing intriguing distortions. Since all of our participants who reported migraine with aura also experienced AIWS symptoms, this could explain our finding a higher prevalence of AIWS symptoms. Circling back to Plato, our study indicates that the Greek philosopher's theory of mimesis does indeed take on a special meaning in the context of Alice in Wonderland syndrome. When artists experience perceptual distortions and employ these - or variants thereof - in their work, can we then say that the result is farther removed from Plato's eternal, unattainable truth than a painting in an orthodox realist style? Or is it rather closer to the truth, since it incorporates as faithfully as possible that what the artist perceives? Whatever the answer to that question may be, distorted realism offers an opportunity to share an artist's unique personal rendition of reality and perhaps also recognize, consciously or subconsciously, distortions that one has experienced oneself.

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