Who Can Tell if it's AI? Applying Inductive Learning to the Detection of AI Photography

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Abstract

Images generated by artificial intelligence models have very recently begun dominating the digital landscape, represented both in encountered content and discussion. These images are becoming increasingly sophisticated and high-quality, especially supposed photographs, being ever harder to distinguish from actual photographs. Given the dangers that artificially generated photography can potentially pose, the present study investigated whether people can be trained to become better at distinguishing genuine photographs from artificially generated ones, and whether motivational predisposition would play a role in this. In an online study, $N = 194$ participants were presented with a series of photographs, and had to quickly indicate whether it was AI-generated or not. Of these, 91 were subjected to an inductive learning paradigm prior to testing. Results showed that experimental performance did not significantly differ between the groups and could not be predicted with motivational predisposition, indicating that people can generally not detect well-generated images, even after training. However, the experimental condition was revealed to have a significant effect on response style, such that participants were much more likely to appraise a photograph as artificially generated, regardless of veracity. The supposed inherently deceptive nature of artificially generated photographs might induce heightened defensiveness in image appraisal.

Introduction

Since its arguable inception in the middle of the 20th century, artificial intelligence (AI) has steadily become powerful: Even before the end of the millennium, IBM's chess computer Deep Blue's victory over then-world champion Garry Kasparov in 1997 marked a milestone in what computers are capable of (Mucci, 2025). Despite this, many of the other domains traditionally thought unique to humans, like writing and creating art, seemingly remained too far out of reach for machines to catch up to. Considering the massive progress in the power of AI and machine learning made in the last ten years, this view is quickly becoming unsustainable: Since 2015, the performance of AI systems on various cognitive domains have started exceeding standard human performance (Kiela et al., 2023). This also became apparent with the public release of OpenAI's ChatGPT large-language model in 2022 (OpenAI, 2022), arguably starting an upheaval in the digital landscape by giving every internet user the ability to generate virtually endless amounts of verbal information to their custom and liking.

Similarly, generative AI models focused on creating images have also become ever more readily available and powerful. Publicly available programs like Midjourney can generate images within seconds based on user-input prompts, which can instruct anything from image content to imitating a certain brushing technique (Midjourney, 2025). The exponential improvement AI models have made becomes evident by looking into the recent past: Reviewing state of the art research from less than a decade ago illustrates how AI systems, even with training, used to struggle with generating photographs that were not severely distorted and blurry, with distinct elements confusingly blending into each other (see Radford et al., 2016). Since then, AI-generated images have become increasingly indistinguishable from human-made ones: For instance, Nightingale and Farid (2022) showed that AI specialised in creating photorealistic headshots of human faces is already powerful

enough to make accuracy of judgment between real or synthetic images no better than chance. This suggests that humans are on the rapidly losing side of a modern arms-race between generative capabilities of AI and human cognitive ability to tell generated images apart from human-made ones. Given the omnipresence of fraud and scams in the digital landscape (Akkerman et al., 2024), the gates are already ajar for AI to be used for wilful deception, for example in the form of impersonation, misinformation or propaganda, for both personal and political purposes. The ramifications of this are illustrated by DiResta & Goldstein (2024), who investigated Facebook pages mass-posting unmarked AI-generated photos, sometimes with clearly deceptive intentions. This naturally brings up the question to what extent, if at all, human ability to spot an AI-generated image is malleable. In other words: Can people learn to (meaningfully) spot AI-generated images?

Inductive Learning

Human learning itself is a massively intricate phenomenon, involving the interplay between complex neural circuits and external stimuli to acquire and expand on knowledge and skills. One category of learning is induction, which is the formation of new concepts or categories by observing examples that would comprise them (Kornell & Bjork, 2008). Induction is therefore essentially the abstraction of specific exemplars into higher-order categories. Since we continuously encounter a near endless array of things, whether it be material things like objects, or more abstract things like ideas, it is necessary for us to formulate categories (and categories of categories, for that matter): This already happens automatically – in fact, due to its essentiality, it must already occur without reliance on explicit thinking or prior knowledge. Any viable conceptual category, even if rudimentary and prone to error, informs an appropriate conduct the next time we are faced with an apparent

member of this category. In the most basic sense, this instinct would for example quickly tell us whether an unknown animal is likely a harmless critter or a dangerous predator.

The concepts of inductive learning can also be exploited experimentally. One example of this is Kornell and Bjork (2008), who demonstrated that experiments using inductive learning can make people better at detecting the style of specific painters. Their experiments additionally showed that, when paintings of different painters are encountered in contrast with one another, it leads to a more viable conceptual abstraction than when category members are each clumped together. In other words, it led to higher accuracy in correctly assigning paintings. Kang and Pashler (2011) expanded on this with their own set of experiments. Their research revealed that presenting multiple paintings of differing artists at the same time holds the same effectiveness as presenting them on at a time. The authors subsequently argue that the mechanism underlying the improved effectiveness of both these methods is that they promote discriminative contrast. This means that when people encounter members of different categories contrasted against each other, their discriminating features become more salient, allowing for better abstraction into categories.

These experiments show that inductive learning works for correctly categorizing paintings. It is possible that a similar effect might also be found for other types of complex visual stimuli, namely photographs. This would potentially be a very useful finding, given that deceptive AI-generated content could easily use imitated photography, in order to convince victims that the content is sincere. Under the assumption that AI-generated photographs have visual properties which are yet still recognisably different from real photographs, such as unrealistic bodily features of humans or inconsistent lighting, the present research investigates whether these can be meaningfully captured and taught using an inductive learning paradigm akin to the interleaved design by Kang and Pashler (2011). Accordingly, the first hypothesis of the present research is as follows:

Hypothesis 1: Training people with an inductive learning paradigm has a positive effect on their subsequent accuracy in detecting the method by which a photograph was made (AI-generated versus real-life), compared to people who have not received training.

Motivational Predisposition Might Enhance Learning

Almost all forms of learning, including inductive learning, require active mental participation. Even if the skills subject to a learning event are implicit, mental resources must be directed to some degree towards the objects or stimuli of importance in order for learning to occur (Hyde & Jenkins, 1969). This means that motivation is crucial to learning, as it provides a reason for directing mental resources. This is supported by a large body of research detailing how motivation explains and predicts learning behaviours (see Urhahne & Wijnia, 2023). More generally, there are also broad interpersonal differences in how people approach making judgments regarding subtle differences, such as those hypothetically present in real/AI photography comparisons: It seems some people have a stable tendency towards trying to compare and contrast these subtle differences, whereas others are not inclined to care as much. This tendency is captured by the concept of *assessment*, a self-regulatory construct proposed by Kruglanski and colleagues' (2000) that measures how much people compare and evaluate entities or states before acting. By extension, it therefore also reflects how strongly people want to make judgments. Those high in assessment will allocate more resources and time to finding the best means for solving a given problem. In a broader context, assessment therefore predicts the focus that people put on having an accurate judgment of things. The construct of assessment can be used to make predictions about the performance of participants for the present study. More specifically, high assessors, driven by their desire for accurate judgment, should be more motivated to correctly evaluate photographs. Consequently, they should allocate more mental resources to analysing images, which might reflect positively on their accuracy in judging presented photographs. This argumentation yields two implications

on the present research: For one, high assessors might generally show increased accuracy as a function of paying more attention to photograph details before making a judgment. Secondly, increased attention paid to the images by high assessors would also imply that they try to make more use of training if presented with it, which would lead to such individuals benefitting more strongly from it than low assessors. Taken together, the second and third hypothesis for the study are therefore:

Hypothesis 2: Scoring higher on assessment reliably leads to increased accuracy in detecting photograph type, regardless of whether training was received or not.

Hypothesis 3: Assessment has a moderating effect on training, such that the gain of accuracy in detecting the method of a photograph granted by training is exacerbated amongst participants who score higher on this trait.

Methods

Participants

Although 222 data cases were initially recorded, some had to be removed prior to analysis: Cases were excluded when they did not fully complete the study (n = 17), failed either of the two attention checks (n = 9), or missed more than 2 items during the main experiment (n = 2) , bringing the final sample to N = 194 participants (70.6% female, 28.9% male, 0.5% identifying as non-binary). Participants had to be at least 16 years old. The participants represent a convenience and snowball sample, made up of participants recruited both through the University of Groningen's SONA platform and privately by the research team, the latter of whom were asked to refer additional participants. Participants from the SONA pool participated for course credit, while those recruited privately voluntarily took part in the study and received no compensation. Data collection for the study ran during the month of April 2025.

Ethical approval was obtained from the Ethics Committee of the University of Groningen. No directly identifiable data was collected in this study. For participants recruited through the SONA platform, the SONA ID was collected solely for the purpose of assigning credit. The data from this study was stored in a secure location in the department of Psychology at the University of Groningen, in accordance with the data management protocol of the Heymans Institute and GDPR regulations.

Materials and stimuli

Questionnaires

The Assessment scale was adopted from Kruglanski and colleagues (2000) to measure interpersonal differences in self-regulation regarding goal-evaluation and setting. The original scale consists of twelve items. Of these, nine were included in the study, while three items were left out for being too specific to social interactions. Each item was evaluated on a Likert scale ranging from 1 (*strongly disagree*) to 6 (*strongly agree*). Example items include: ‘I like evaluating other people’s plans’, as well as ‘I am a critical person’. Higher scores indicate a stronger inclination to evaluate and compare states or goals before deciding on an action compared to lower scores. This scale was used alongside other questionnaires used in the research project, but which were not used for this analysis and are not further elaborated upon.

Visual Stimuli

A total of 120 photograph stimuli were used for the study. Of these, sixty were real photographs, selected from public image-sharing websites (Pixiv, Pixabay, Pexels) and from photographers who granted permission to use their work (see Appendix). The remaining sixty were faux photographs, generated via the AI image generation models of Midjourney Version 6.1 (Midjourney, 2025) and xAI’s Grok version 3 (xAI, 2025).

Both AI and genuine photography were furthermore each separated into three conditions of equal size, based on image content: (I) "Everyday" photography, depicting

humans in situations as would typically be observed in various everyday settings, (II) landscape photography, occasionally also depicting edifices like castles, and (III) artistic photography, depicting one or two humans in stylised photo shootings, with specific and staged elements like composition and lighting. Thus, there were twenty pictures for each condition in each of the six photograph conditions. Example images for each condition, as well as prompts used for image generation, are provided in the Appendix.

Procedure

At the start of the online study, participants were asked to fill out a series of questionnaires. After this, participants were instructed about the upcoming experimental task. The presentation of these instructions differed slightly between the test and control groups, to which each were assigned with a 50% chance. Participants randomly assigned to the test group were informed that the task consisted of a learning and subsequent testing phase. In the learning phase, participants were to be presented with photographs that were either AI-generated or genuine photography, along with a corresponding label. Each image was shown for five seconds, without a pause in between. Unbeknownst to the participants, the images, while themselves selected at random, followed an underlying interleaved pattern, meaning that genuine photography was always followed by an AI-generated photo, and vice versa. This was done to promote discriminative contrast between the two photograph types (see Kang and Pashler, 2011). After all 78 images (made up in equal parts of the six conditions, for thirteen images each) were shown, the learning phase commenced. Participants randomly assigned to the control condition were not given a learning phase and skipped straight to the instructions for the testing phase. Here, participants were presented with an image for fifteen seconds, during which they had to indicate whether they believed the image to be AI-generated or genuine photography. After fifteen seconds elapsed or participants continued to the next page, the next image was shown. It was not possible for participants to pause during

the testing phase, which consisted of 42 images, once again made up in equal parts of the six categories, for seven images each. After the study, participants could see their final score on the test.

Results

Preliminary Analysis

Descriptives statistics for testing phase accuracy, condition, and assessment score, as well as their Pearson correlations are depicted in Table 1. Testing phase accuracy is defined as the proportion of correct responses by a participant. None of the correlations are statistically significant, except for a weak correlation between accuracy and assessment score ($p < .001$). Participants generally performed somewhat better ($M = 0.5718$) than would be expected by chance. This difference is statistically significant ($p < .001$, Table 2). Table 3 furthermore shows test accuracy by condition (training/ no-training). However, no differences were found comparing the accuracy between the two study groups.

Table 1

Descriptive Statistics and Pearson Correlations for Study Variables

	n	M	SD	1	2	3
1. Accuracy	194	0.5718	0.083	-	-	-
2. Condition[a]	194	0.47	-	,005	-	-
3. Assessment	194	4.183	0.664	,192**	,051	-

**. Correlation is significant at the 0.01 level (2-tailed).
a. 0 = Control (No Training); 1 = Experimental (Training)

Table 2

One-Sample t-Test for Mean Test Accuracy Compared to Chance

	Test Value = 0.5						
			Significance			95% CI	
	t	df	One-Sided p	Two-Sided p	Mean Difference	Lower	Upper
Accuracy	12.055	193	<.001	<.001	.0718	.0600	.0835

Table 3

Testing phase accuracy by group (measured as proportion of correct responses)

Condition[a]		
0	Valid	103
	Mean	.5714
	Std. Deviation	.07890
	Minimum	.38
	Maximum	.76
1	Valid	91
	Mean	.5722
	Std. Deviation	.08777
	Minimum	.38
	Maximum	.83

a. 0 = Control (No Training); 1 = Experimental (Training)

Hypothesis Testing

An ANCOVA was performed to test the present hypotheses. Accuracy was entered as the dependent variable, while the test condition (presented as a dummy variable), assessment score, and their interaction term (Condition*Assessment) constituted the independent variables. Assessment scores were standardised to compute the interaction term. There were no major assumption violations; results are shown in Table 4. Experimental condition did not contribute significantly to explaining variance in test accuracy ($F(1, 191) = .005$, $p = .943$). Assessment scores also did not contribute a significant amount of explained variance ($F(1, 191) = 3.217$, $p = .074$). Likewise, this is also the case for the interaction between the two variables. ($F(1, 190) = .240$, $p = .625$). These findings show that the variance in test accuracy observed between participants could not be reliably predicted using the proposed variables.

Table 4
ANCOVA Table

Source	Sum of Squares (Type III)	df	Mean Square	F	p	η_p^2
Condition	$4.098e^{-5}$	1	$4.098e^{-5}$	0.006	.938	.000
Assessment	0.022	1	0.022	3.217	.074	.017
Interaction	0.002	1	0.002	0.240	.625	.001
Residuals	1.277	190	0.007			

Exploratory Item Analysis

The experiment used a diverse selection of photographs, with varying content and perspective both between and within categories (see Methods section). Because of this, there might be differences between the two groups seen only on the level of item accuracy, as opposed to accuracy on the test overall. Table 5 shows the mean accuracy on individual items of all real and AI-generated photographs, respectively, separated by group. Comparing the accuracy of groups shows that there may indeed be relevant differences between them.

Table 5
Mean Accuracy on all Test Items per Group
(AI-Photographs on the Left; Real Photographs on the Right)

	Control		Training	
	N (Valid)	Mean	N (Valid)	Mean
PAI1	101	.29	91	.66
PAI2	101	.70	91	.80
PAI3	102	.21	91	.31
PAI4	102	.84	91	.87
PAI5	102	.59	91	.79
PAI6	103	.74	91	.78
PAI7	103	.52	91	.74
LAI1	103	.24	90	.32
LAI2	103	.32	90	.49
LAI3	102	.29	91	.44
LAI4	103	.59	91	.73
LAI5	103	.55	91	.68

	Control		Training	
	N (Valid)	Mean	N (Valid)	Mean
PR1	103	.83	91	.70
PR2	103	.90	91	.66
PR3	102	.65	91	.46
PR4	103	.81	90	.68
PR5	101	.82	89	.57
PR6	103	.88	91	.74
PR7	103	.70	91	.52
LR1	103	.82	91	.70
LR2	103	.63	91	.56
LR3	103	.80	91	.70
LR4	102	.47	91	.32
LR5	102	.49	91	.55

LAI6	103	.68	91	.74	LR6	103	.79	90	.69
LAI7	103	.60	90	.80	LR7	103	.47	90	.46
AAI1	101	.33	91	.38	AR1	103	.81	90	.61
AAI2	103	.35	90	.43	AR2	103	.66	91	.56
AAI3	102	.32	91	.44	AR3	102	.60	91	.57
AAI4	102	.56	90	.64	AR4	103	.06	91	.10
AAI5	103	.46	91	.42	AR5	103	.60	89	.37
AAI6	103	.31	91	.33	AR6	103	.52	91	.43
AAI7	103	.37	91	.54	AR7	103	.92	91	.84

Interestingly, almost all differences are unidirectional, but oppositional, for real or AI photography. In other words, differences in accuracy on real photographs almost universally show the control condition outperforming the training condition, while the reverse is true for AI photographs. A set of independent-sample t-tests for selected items confirm that these proportional differences are indeed statistically significant (p <.01, Table 6). In other words, this peculiar finding suggests that the experimental group had a noticeably higher tendency to evaluate a photograph as AI-generated compared to the control condition. Consequently, this group scored higher for one, but lower for the other image type. Because both image types comprise the same number of pictures, this equalises to a null effect when investigating the full test.

Table 6

Differences Between Control Versus Training Group on Four Selected Test Items

	Control		Training					
	M	*SD*	*M*	*SD*	*df*	*t*	*p*	Cohen's d
PR2	.90	.298	.66	.477	192.000	-4.322	< .001	0.392
AR5[a]	.60	.492	.37	.486	186.626	-3.269	.001	0.489
PAI1[a]	.29	.455	.66	.477	185.729	5.523	< .001	0.465
LAI7	.60	.492	.80	.402	191.000	3.035	.003	0.452

[a] Welch test is reported because Levene's test indicated a violation of the assumption of homoscedasticity for this variable

In light of this finding, the data was further analysed using new variables that measure the proportion of test items, both real and AI, which participants judged to be AI, referred to as the AI guess rate. Linear regression was performed to see how the experimental condition can predict the rate of AI guesses across the whole test and separately in each of the three photograph categories. Indeed, AI guesses were shown to be significantly more prevalent in every category following training, and highest among everyday human photography ($p \leq .001$, Table 7). Thus, training consistently led to participants being more likely to rate a presented photograph as being AI-generated. Additionally, the predictive role of assessment for AI guess rate was also investigated but was shown to not explain any variance beyond the experimental condition (Table 8).

Table 7

Regression Model Coefficients for AI guess rates

Model		Unstandardized Coefficients		t	Sig.	95.0% Confidence Interval for B	
		B	Std. Error			Lower Bound	Upper Bound
1[a]	(Constant)	.396	.011	36.758	>.001	.375	.417
	Training=1	.117	.016	7.462	>.001	.086	.148
2[b]	(Constant)	.377	.018	21.478	>.001	.343	.412
	Training=1	.168	.026	6.561	>.001	.118	.219
3[c]	(Constant)	.417	.017	24.749	>.001	.384	.450
	Training=1	.098	.025	3.991	>.001	.050	.147
4[d]	(Constant)	.394	.018	21.623	>.001	.358	.430
	Training=1	.086	.027	3.222	.001	.033	.138

a. All images b. Everyday person photography

c. Landscape photography d. Artistic photography

Table 8

Regression Model Summary for AI guess rates

Model	R	R Square	Change Statistics				
			R Square Change	F Change	df1	df2	Sig. F Change
1	,474[a]	,225	,225	55,677	1	192	<.001
2	,474[b]	,225	,000	,016	1	191	,899

a. Predictors: (Constant), Condition
b. Predictors: (Constant), Condition, Assessment

Discussion

The aims of the present study were to investigate whether inductive learning could be exploited via an experiment for the purpose of training people to distinguish genuine photographs from AI-generated ones more precisely. Additionally, the study explored whether interpersonal differences in motivation can predict performance in such a task. To this end, we randomly assigned participants to a training phase, in which they were presented with briefly shown AI photographs interleaved with real ones. All images were shown briefly, alongside accurate labels of the image type. Afterwards, all participants were subjected to a testing phase in which they had to quickly judge presented photographs as either real or AI-generated.

The first hypothesis in this study was that presenting participants with a training phase would reliably lead to increased accuracy in detecting whether a photographs was real or AI-generated. The results strongly show that this was not the case, and rather showed an almost complete null effect, with both groups correctly assigning pictures at the same rate, somewhat above chance level. This essentially means that the effects of an inductive learning paradigm with interleaved design, as showcased by Kornell & Bjork (2008) and Kang & Pashler (2011), could not be replicated in the context of distinguishing real and AI-generated photography. Both the second and third hypotheses of this study concerned whether the motivational construct assessment could be used to explain variance in test performance as a direct or interactional effect with training, respectively. The full ANCOVA model shows that neither hypothesis could be supported. This lends further support to the idea that the AI-generated photographs used in this study were overall of such high quality in resembling genuine

photography that inclination towards increased caution and thought before making a decision in this task did not come with an improvement in accuracy. Perhaps, the effects of this constructs were limited by the short time span given in this experiment: Had participants been given more or even unlimited time to decide, it is likely that those higher in assessment would have on average analysed a photograph for longer, which may have also corresponded with a higher score. Lastly, although not formally hypothesised, the study showed that participants who were exposed to a training phase, in which many AI-generated photographs were displayed interleaved with real photographs, were significantly more likely to subsequently judge a presented photograph during testing as being AI-generated across all categories of image content. Thus, these participants did not show an overall higher accuracy on the test but engaged in a significantly different pattern of decision making than those who immediately underwent the testing phase.

Induction in Paintings May Not Generalise to Photographs

The main hypothesis of this study was that, in line with previous research using paintings, a training phase based on inductive learning would improve the ability to tell presented AI-generated photographs apart from real ones. However, such an effect could not be replicated. It is subject to speculation why this was the case. Given that the paradigm was methodically adapted faithfully to the experiments it was based upon, it is unlikely to have had anything to do with the experiment setup itself. Additionally, with the clear findings that the preceding experiments put forward, it is also implausible that there is an issue with the inductive learning paradigm per se. Rather, the issue with the present experiment likely lies one of the primary assumptions of this specific experiment, namely, that AI-generated photography possess visual properties that can be differentiated from genuine photography in a brief timespan. Based on the data, while some of the items were correctly identified by a

large majority, most of them were apparently of sufficiently high quality to not contain any visual characteristics that would quickly give them away.

A crucial difference between this experiment and previous work by Kornell and Bjork (2008), as well as by Kang and Pashler (2011), is that the latter had participants implicitly learn the styles of certain painters. While the elements that compose the styles of specific painters can be subtle, larger aspects, such as the painting material or art movement, are easier to visibly distinguish after some exposure even if one is not consciously aware of these movements. This sets the stage for implicit learning, from which more personalised aspects such as the general length and thickness of brush strokes can be assimilated into patterns to help people distinguish painters' styles. While the raw content of what is portrayed in a painting can be important (such as in historical portraits), how it is painted has an arguably much stronger implication on how a painting is generally judged and perceived. Additionally, a painting must necessarily follow a style due to its nature of being materialised through the artist. This would incidentally also apply to AI models generating paintings, whether it be by imitating a specific painter, or by abstracting and estimating a "general style" of paintings.

In contrast, the present experiment used photography, for which the aforementioned features do not hold. While it is true that photographs also have unique style elements such as perspective or lighting settings, they are first and foremost defined by what they show, because photographs are supposed to reflect the real world by capturing light that was reflected off material surfaces, instead of being conjured up with a brush or similar tools. Therefore, AI-generated photographs would be distinguishable from real photography not by unique style elements, but simply because they do not look like they depict something that really exists, as identified for instance by unrealistic textures or conceptual inconsistencies. Ultimately, this qualitative difference impedes implicit learning and shifts the focus within the

experimental task from trying to recognise previously seen details to actively appraising each photograph on its own terms.

Unintended Effects of Training Phase

While the results show that the testing phase did not affect people's performance in the experiment, upon closer scrutiny, it became clear that this tells only half the story. Participants who underwent a training phase were actually significantly more likely to correctly identify an AI-generated photograph – at the cost of being less likely to correctly identify a real photograph by the same margin. Simply put, participants in the training condition were more likely to identify an image as AI-generated, regardless of veracity.

Exactly why participants chose to err on the side of a photograph being AI-generated as an effect of training is subject to additional speculation. Perhaps, people feel that there is a qualitative difference between incorrectly judging a real photograph to be AI-generated and vice versa: While incorrectly rejecting a real photograph might be an undesired outcome, accepting a photograph as genuine when it is actually AI-generated might be perceived as "having been fooled". This would be because AI-generated photography, being essentially "fake" due to it not capturing anything that actually exists per se, has inherently deceptive properties if not explicitly marked as such. Therefore, pre-emptively deciding (even unconsciously) to judge an ambiguous photograph as AI would shield oneself from the potential embarrassment of being deceived by AI-content. This risk aversion makes people more willing to forego the perceived benefit of a correctly identified real photograph, as long as they can avoid the perceived loss of incorrectly accepting an AI-generated photograph as real. The fact that this effect is most pronounced in photographs depicting portrait-like shots of people in every day environments supports this speculation, as this category arguably best reflects real experience: Unlike the other categories, they are supposed to be candid snapshots of humans as we would see every single day. Such a photograph being completely fabricated

therefore has a much more deceptive air to it than one depicting inanimate scenery, or elaborately set up photoshoots that are not supposed to look like something you would normally encounter.

Strengths and Limitations

Although the initial hypotheses for this study were not supported apart from one conditional exception, it still had considerable strengths that should be mentioned: Firstly, it was a methodologically sound and novel experiment, connecting established knowledge about learning processes with similar, more topical concepts. Given the current rapid development of generative AI models, this exploratory style also made the study very relevant. Even if the proposed effects could not be identified in this study, post-hoc findings discovered in the experiment data may actually be used as a starting point for additional research. The experiment also had a large sample size given the short time span of data collection and was generally well received by participants.

The experiment's limitations should also be discussed. For one, the selection of photographs for the experiment was not based on objective criteria, but rather on subjective approval of the research team. Although some soft guidelines were followed in selecting appropriate images, such as excluding AI-generated images with egregious error or not using multiple real photographs depicting the same scene or people, the selection was ultimately subjective in a way that promoted the apparent difficulty of items, as well as some diversity in photograph content. This diversity, which included using a wide range of keywords within the different prompts used, might have also worked against the experiment by making categories too broad in what they show. Therefore, it is entirely possible that the selection had unintended effects on how the study played out in a way that is difficult to capture or control: For instance, the fact that the AI guessing rate was affected by the training condition most for everyday portrait shots might partially be dependent on the specific photographs that were

used. Perhaps, more rigidity in setting categories would have been beneficial for this type of experiment, such as by setting up more specific categories, with less variance in content. This would make potential patterns in images clearer, increasing the likelihood that they would be picked up by participants.

Moreover, a related limitation for this line of experiments is the effective transience of the AI-generated photographs that are to be used: The impetus for this kind of research is the stark improvement of the models in recent times, yet this constant improvement also keeps eliminating potentially detectable features of AI photographs. Anecdotally, just as the compilation of visual stimuli was finished for this experiment, OpenAI released their new GPT-4o model, which can generate photography-style images with even more realism than before (OpenAI, 2025). This further muddies the waters between real and fake images, and leads to the question of how time-bound any discovered predictors of accuracy in this experiment would be.

A last, rather minor limitation is that the experiment was sometimes perceived as too long by participants assigned to the experimental condition. This is evident from notes that some participants left at the end of the study, but also because excluded data points were disproportionately from the experimental group, indicating that participants assigned this condition were more likely to not finish the study. While this was not directly problematic for the sample and subsequent analysis, the experiment could have perhaps been more concise as to minimise participant attrition.

Future Research

This study was notably exploratory in how it aimed at connecting discovered learning concepts with emerging topics of the digital landscape. Ultimately, the proposed hypotheses could not be sustained. Future studies could try tuning this experimental design to remove confounds to dig deeper into potential contexts in which people can become better at

detecting AI-photography. This would likely include curating visual stimuli more objectively, for instance by first running them through rudimentary tests like online surveys to see how difficult they are to detect per se, such that the base difficulty of the test is known and malleable beforehand. This would also test whether specific category differences are replicable when selecting different photographs, lending support for the validity of the categories. However, such endeavours would be cost-intensive whilst lacking strong evidence of producing meaningful results, especially with the aforementioned constant change in generative models' strength.

A more worthwhile direction for future research would be to expand on the unintended findings about changes in photograph appraisal after exposure to AI-generated photography as in the present study's learning phase. Because this was unexpected prior to data collection, all hypotheses about why this effect occurred are post-hoc and based on the specific data set from this experiment. However, future studies could consult the emerging literature on how people act in response to other perceived deception in experimental tasks, and see if such response styles converge with those observed in the present studies. Another approach would be to repeat the study, but using different photographs generated with up-to-date models, in order to inspect whether the same differences between photograph categories are reproducible.

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Appendix

AI Prompts

Landscape

A scene of the rugged Scottish Highlands, dominated by rolling hills covered in lush green and golden heather. Mist drapes over distant mountains, partially obscuring their peaks and an ominous, old castle. The sky is overcast with dramatic clouds, casting a moody, atmospheric light. Small rocky outcrops and scattered patches of wild grass add to the untamed beauty of the landscape. A soft breeze bends the tall grasses, and a faint glimmer of a loch can be seen in the distance. Cinematic composition, soft natural lighting, taken with a high-resolution DSLR camera.

A South German countryside in spring with rolling green hills stretching into the distance. Winding country roads weave through the landscape, flanked by lush meadows filled with blooming wildflowers in shades of yellow and white. Traditional Bavarian farmhouses with wooden balconies and red-tiled roofs sit nestled among the hills. Dense, dark green forests dot the scenery, contrasting with the bright fields. In the background, the misty foothills of the Alps rise gently, their peaks softened by a light haze. The warm afternoon sun casts a golden glow, highlighting the vibrant colors of nature. A peaceful, idyllic atmosphere with clear blue skies and a few fluffy white clouds drifting above. Taken with a high-resolution DSLR camera.

A sun-drenched Mediterranean beach promenade, warm golden sand stretching along the coast. The turquoise waves gently lap against the shore, shimmering under the bright afternoon sun. Elegant, whitewashed buildings with terracotta roofs stand nearby, their balconies adorned with vibrant bougainvillea. Cozy cafés and seafood restaurants spill onto the promenade, with people strolling leisurely or enjoying espresso at outdoor tables. The salty ocean breeze carries the scent of grilled sardines and citrus. In the distance, rugged cliffs and rolling hills frame the coastline, creating a perfect harmony between nature and charming seaside life. Shot with a high-resolution DSLR camera

Scandinavian coastal village nestled along a rugged, rocky shoreline. Small wooden houses painted in vibrant red, yellow, and white stand against the deep blue sea. Jagged rocks and smooth, weathered stones line the coast, where fishing boats are moored near wooden piers. The sky is a mix of soft clouds and clear blue, with the golden light of the afternoon sun casting a warm glow over the scene. In the distance, rolling hills and small islands dot the horizon, creating a tranquil, idyllic Nordic atmosphere. Shot on Sony a7r iv, macro lens, fullframe.

editorial landscape photography, side on view, a single cabin in a snowcovered minimalist landscape, winter's isolation, icy blues, pure whites, shot on sony alpha 1, macro lens, apsh, diane arbus style, overcast, snowy day, open field, cozy, secluded, fresh snow, barren trees, unblemished, solitude, winter color, art nouveau, snow overlay, freeze motion, color isolation

A vast, untouched Siberian wilderness stretching endlessly under a pale winter sky. Snow-covered taiga forests with towering evergreen trees dusted in frost stand beside a frozen river, its surface cracked with icy blue veins.

Rolling tundra extends to the horizon, bathed in soft, diffused light. Mist drifts over the landscape, adding a mysterious, ethereal atmosphere. In the distance, jagged mountains rise, their peaks hidden in a veil of icy fog. The air feels crisp and silent, capturing the raw beauty of Siberia’s remote and unforgiving nature. Cinematic composition, taken with a high-resolution DSLR camera."

A tranquil sacred grove deep in the Japanese countryside, surrounded by towering ancient cedar and blooming cherry blossom trees. Soft pink petals drift through the air, settling on a moss-covered stone path that winds through the forest. Sunlight filters through the delicate sakura branches, casting warm, dappled light on the ground. A small, weathered Shinto torii gate stands quietly among the trees, partially covered in climbing ivy. In the distance, a tiny wooden shrine with faded red paint blends seamlessly into nature, its paper lanterns gently swaying in the breeze. The air is filled with the sweet fragrance of cherry blossoms and damp earth. A lone stone water basin, covered in green moss, reflects the stillness of the grove, evoking a deep sense of harmony and spiritual serenity. Shot on Sony a7r iv, macro lens, fullframe.

A vast North African landscape bathed in warm, golden sunlight. Rolling sand dunes stretch endlessly into the horizon, their curves shaped by the desert wind. In the distance, rugged, rocky plateaus and jagged mountains rise under a brilliant blue sky. Scattered Berber tents and ancient mud-brick villages cling to the hillsides, their earthy tones blending seamlessly with the desert. The air is dry and hazy, with the occasional dust cloud drifting across the horizon. High-resolution DSLR mirrorless camera, 300mm lens.

A secluded Caribbean cove with a small, hidden beach nestled between rugged cliffs covered in lush green vegetation. The turquoise waters gently lap against the shore, creating a gradient from deep blue to crystal-clear near the sand. Sunlight reflects off the water, casting shimmering patterns on the rocky coastline. Sparse, scattered houses sit atop the cliffs in the distance, barely visible through the dense foliage. The atmosphere is peaceful and untouched, with only the sounds of the waves and rustling leaves in the breeze. Cinematic, aerial view, shot on high-resolution DSLR camera, 300mm lens

A sweeping panoramic vista of the Ural Mountains, dramatic mountainous landscape with purple-blue peaks extending into the distance, lush green coniferous forests at the base, winding turquoise river cutting through a valley floor, bright blue sky with scattered white fluffy clouds, afternoon sunlight illuminating the slopes, crisp high-resolution photography style, wide-angle lens, vibrant natural colors.

cinematic, evergreen forest in afternoon, wide-angle landscape perspective with a low to mid-level camera angle, sun gently lighting up the scenery through the thick canopy, shot on sony a7r iv, macro lens, fullframe, tranquil atmosphere, firn trees, casual, lively, soft focus, pastel shades, bokeh, lens flare, soft filter

cinematic, evergreen forest in afternoon, wide-angle landscape perspective with a low to mid-level camera angle, sun gently lighting up the scenery through the thick canopy, shot on sony a7r iv, macro lens, fullframe, tranquil atmosphere, firn trees, casual, lively, soft focus, pastel shades, bokeh, lens flare, soft filter

A breathtaking view of snow-capped mountains at sunrise, with a clear blue sky and a serene lake reflecting the peaks, hyper-realistic, high detail.

Make a landscape picture as if it was made by a human.

Make a landscape picture as if it was made by a human. National geographic style.

Make a photorealistic landscape picture as if it was made by a human. National geographic style.

A highly detailed, photorealistic image of a quiet lakeshore at dawn, taken with a professional DSLR camera using a 50mm lens. The foreground focuses on smooth, damp pebbles, partially submerged in the shallow water, with soft ripples gently lapping against them. A thin layer of morning mist hovers just above the still lake, gradually dissipating as the first light of the rising sun breaks through the treetops in the background. The lake reflects the warm hues of the sky, blending soft oranges and pale blues in perfect harmony. Distant pine-covered hills line the horizon, their dark silhouettes contrasting subtly with the glowing morning light. A few fallen leaves float on the water's surface, slightly curled at the edges, hinting at the early days of autumn. The air feels crisp and still, with no artificial enhancements--just the simple, raw beauty of nature captured in perfect clarity. The image features natural imperfections such as slight lens haze, subtle noise in shadowed areas, and organic depth of field, ensuring it is indistinguishable from a real photograph.

A crisp, photorealistic autumn morning in a quiet countryside field, captured with a professional DSLR camera using a 50mm lens. The foreground showcases frost-covered grass blades, glistening under the soft golden light of the early sun. A narrow dirt path, slightly damp from morning dew, winds gently through the field, bordered by wooden fence posts with peeling paint and tangled vines. In the middle ground, a small, still pond reflects the muted blue sky, with a few gentle ripples caused by a passing breeze. A single tree stands near the water, its sparse leaves in shades of orange and yellow, some drifting slowly to the ground. Beyond the pond, rolling hills covered in a patchwork of fields and clusters of trees fade into a light morning mist, adding soft atmospheric depth. The sky is clear but with a few wispy clouds stretching across the horizon. The image has natural imperfections, such as slight lens haze in the distance, tiny specks of dust catching the sunlight, and subtle variations in color temperature, making it indistinguishable from a real photograph.

A crisp, photorealistic autumn morning in a quiet countryside field, captured with a professional DSLR camera using a 50mm lens. The foreground showcases frost-covered grass blades, glistening under the soft golden light of the early sun. A narrow dirt path, slightly damp from morning dew, winds gently through the field, bordered by wooden fence posts with peeling paint and tangled vines. In the middle ground, a small, still pond reflects the muted blue sky, with a few gentle ripples caused by a passing breeze. A single tree stands near the water, its sparse leaves in shades of orange and yellow, some drifting slowly to the ground. Beyond the pond, rolling hills covered in a patchwork of fields and clusters of trees fade into a light morning mist, adding soft atmospheric depth. The sky is clear but with a few wispy clouds stretching across the horizon. The image has natural imperfections, such as slight lens haze in the distance, tiny specks of dust catching the sunlight, and subtle variations in color temperature, making it indistinguishable from a real photograph.

A serene, photorealistic late afternoon scene in a vast open grassland, captured with a high-end DSLR camera using a 35mm lens. The foreground features tall, golden prairie grass swaying gently in the breeze, individual blades catching the soft sunlight. A well-trodden dirt trail cuts through the grass, leading toward a distant, lone oak tree standing against the expansive horizon. The rolling hills in the background stretch far, their subtle contours fading into a light atmospheric haze. The sky is a soft gradient of pale blue with sparse, wispy clouds tinged with warm hues from the setting sun. Shadows grow long, creating a natural contrast that enhances the depth and realism of the scene. A small flock of birds is visible high in the sky, moving lazily in the distance. The image is perfectly balanced, with natural imperfections such as slight lens flare from the sun, tiny dust particles floating in the warm air, and gentle motion blur in the windblown grass, making it feel like an authentic, untouched photograph.

A serene, photorealistic winter scene of a small wooden cabin in the middle of a snow-covered field, captured with a 50mm lens. The cabin, simple and rustic, sits alone in the center of the frame, its roof blanketed in fresh snow, with a thin trail of smoke rising gently from the chimney. The surrounding snow is untouched, soft and powdery, reflecting the pale, cool light of the overcast sky. The area around the cabin is empty, with just a few scattered snow-covered bushes and the distant outline of a forest at the edge of the field. The sky above is cloudy, casting soft, diffused light that creates long, gentle shadows on the snow, highlighting the textures of the frost and the simple lines of the cabin. The air feels crisp, and a few snowflakes are gently falling, adding to the tranquility. The image includes natural imperfections like a soft haze, slight lens blur in the distance, and fine details of snow drifts around the cabin, making it feel like a real, peaceful winter moment.

Grok: Make a landscape picture.

Grok: Make a landscape picture.

Grok: Make a landscape picture.

Grok: Make a landscape picture.

Grok: Make a landscape picture.

Grok: Make a landscape picture.

A serene landscape at golden hour, featuring rolling hills covered in lush green grass, a calm river reflecting the warm hues of the sunset, scattered wildflowers in the foreground, and a few fluffy clouds in a clear blue sky. The scene should capture the natural beauty and tranquility of the moment, with soft lighting and realistic textures, resembling a high-quality photograph.

Everyday Human

A woman playing cello in a city, there are two people walking by. You can see a building in the background

A man reading a book. He is sitting on the stairs from a city church. The photo is taken from above, with a ray of light in his eyes.

(Generated by someone else)

A couple posing in front of the Eiffel Tower in Paris

A couple walking in a busy shopping street in Italy during the summer. They are a bit further away in the background and there is a tree, more in the front but to the side

Two friends posing in front of a Christmas tree in a German Christmas market

A teenager skateboarding at a skate park with ramps and graffiti-covered walls in the background.

An old white man, standing at a lake. It is cloudy and you can see mountains in the background

Someone dancing on the street. Other people are passing by and minding their own business. The person is wearing hip skater clothes

A construction worker operating machinery at a urban construction site during the day.

A cyclist riding along a scenic coastal road with the ocean and cliffs in the background.

A candid wedding moment of a couple at a wedding together under a canopy of leaves, evening reception vibe, the bride's flowing dress twirling as they dance, authentic emotions, photojournalistic style, high-resolution, sharp details, vibrant and warm tones, sony A7R

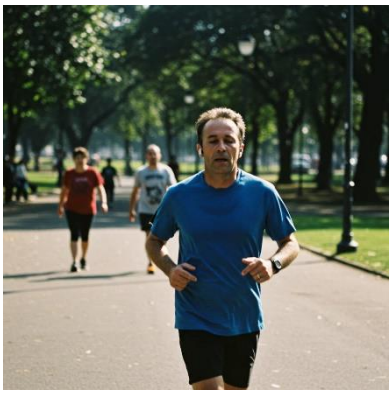
A vibrant street snapshot documentary style of two young women walking together in an urban park. They wear colorful, eclectic clothing with bold patterns and layered accessories, their hair dyed, and they carry unique bags and small items, capturing an alternative green background, documentary style, snapshot, dslr

A candid airport reunion scene, two people hugging deeply near the arrivals gate, one face visible slight tears, The busy terminal around them , with flight information screens and rolling luggage in the sharp background, handheld , documentary style, snapshot

Wedding photograph, unedited, couple walking down the aisle, people sitting on chairs blurry in the background, woman is smiling locking to the ground, men is lokking proud, in motion walking, sony a7R3

Dancers dancing on public square, surrounded by an audience of passersby some couples dancing closely, others laughing and spinning with flair. The square is paved with stones, framed by trees and historic buildings, sharp light, subtle colors Street photography, documentary style, sony, 50mm

public park in the distance a jogging middle aged man blue t shirt, exhausted look on face, sharp sunlight, documentary style, snapshot, 100mm, sony



photograph of an old white man, front view, portrait, closed eyes, full face, standing at the edge of a serene lake, gazing into the vast natural landscape, The man, wearing casual outdoor clothing, stands with a casual posture, amateur snapshot, 50mm, documentary style

Artistic

Studio portrait of an androgynous person with glass shards reflecting rainbow colors, prismatic light scattering across their face, soft-focus and ethereal ambiance, abstract and expressive, futuristic and artistic vibe

Studio Photography stylish plus-size asian model posing wearing an elegant, flowing dress , illuminated by colorful, artistic lighting in shades of pink, blue, and white, white studio background, extravagant hair style, The model's expression is poised and radiant, and the composition highlights body positivity and high-fashion energy. Sharp focus, soft shadows, and a polished, editorial-style aesthetic, vogue cover, lgbtq

Professional studio photography of skinny man, tattoos on upper body, dramatic look, strong blue lighting, curly hair , sony a7R

A striking, artistic studio portrait of a woman with short, sleek black hair, dressed in a simple, elegant black dress. The lighting is dramatic, with sharp contrasts casting deep shadows and highlighting the graceful curves of her face and neck. The background is a soft, monochrome gradient, adding a sense of timeless elegance and focus on her intense, contemplative gaze.

A high-fashion studio portrait of a poised young woman with makeup in shades of pink, blue, and black, featuring a soft matte complexion and glossy lips. She wears large, dangling star-shaped earrings encrusted with gems, adding a luxurious feel. Her hair is sleek with subtle color highlights at the tips. The subject is dressed in a delicate, pleated white high-collar blouse, exuding an ethereal elegance. Shot with a Hasselblad H6D-100c, 100mm lens, f/4creating a clean white background with a halo glow effect around the edges

A high-fashion black-and-white studio portrait of a man with splashing water, flash photography movement in the dark, her face partially illuminated by soft, diffused lighting. Dramatic monochrome contrast highlights her bold facial features and intricate textures of water droplets cascading down skin Shot with a Hasselblad H6D-100c, 100mm lens, f/4, capturing every fine detail in stunning clarity, a mist of water droplets suspended in the air, creating an ethereal and cinematic atmosphere, water splashes flash photography

Studio photograph of a young woman posing gracefully in a 1920s flapper dress with intricate beading and fringe. She wears a stylish feathered headband and dark, dramatic makeup with bold red lips. The studio lighting is soft and moody, casting vintage-style shadows. The background features an Art Deco-inspired design with gold and black tones, evoking the glamorous atmosphere of the roaring twenties Leica M6 (35mm Film)

A bold, high-fashion portrait of a young woman in a metallic silver dress with sharp, geometric patterns. Her makeup is abstract, featuring neon accents and glossy, iridescent lips. The lighting includes vibrant, colored gels casting blue and purple hues on her face, glow shot on Hasselblad

Fashion-focused studio photograph of a woman in traditional Bedouin clothing, striking a poised pose, sharp lighting to emphasize the details of the outfit, neutral background to keep attention on the subject

A high-resolution studio portrait of a woman standing in front of a pure white backdrop. The composition is clean and minimalist, with soft, diffused lighting creating gentle shadows. Ethereal light prism effects refract around the subject, adding subtle rainbow hues. The model's expression is serene, evoking a sense of calm and elegance. Shot with a high-end camera, ultra-sharp details, and cinematic quality

A hyper-realistic, artistic studio portrait of a woman with deep brown skin, her face partially covered in shattered gold leaf, creating a striking contrast against her smooth complexion. The lighting is moody and directional, with a single spotlight casting dramatic highlights on the gold while leaving parts of her face in deep shadow. The background is a soft, velvety black, fading into a subtle gradient. Her expression is powerful yet introspective, her gaze slightly averted, as if lost in thought. Tiny gold flakes appear to be floating in the air, catching the light in a way that feels almost surreal, yet completely realistic. The fine details--pores, subtle skin texture, the delicate edges of the gold leaf--are captured with astonishing clarity, making this image feel like a masterfully staged high-fashion art photograph.

Grok: A hyper-realistic, artistic studio portrait of a woman in an unconventional pose--her body slightly twisted, one arm elegantly raised above her head, fingers gently curved as if reaching for something unseen. She wears a flowing, semi-transparent silk fabric that wraps around her body, caught in mid-motion, as if frozen in time. Her expression is serene yet intense, her eyes half-closed, lips slightly parted as if in a deep moment of thought or emotion. The lighting is dramatic and moody, with a single warm spotlight casting intricate shadows across her face and body, while a subtle cool backlight traces the edges of her form, adding depth and dimension. The background is minimalist, a smooth, muted gradient that fades into darkness, enhancing the focus on her form. The details--soft skin texture, the gentle tension in her fingers, the natural creases in the fabric--are captured with exquisite realism, making this feel like a meticulously crafted, high-end fashion or fine-art studio photograph.

Avant-garde studio portrait of a human figure, ethereal and experimental, bathed in shifting veils of colored light from a cracked stained-glass panel overhead, surrounded by a chaotic arrangement of floating gauze strips and charred branches, muted palette of frost blues, ash grays, and burnt corals with organic gradients, subject wrapped in frayed translucent fabric or crowned with twisted wire, natural posing with subtle flaws like smudged makeup or tangled hair, hyper-realistic skin under harsh spotlight glare, raw and unpolished texture, 8k resolution, mimics a daring human-photographed art piece.

Create a hyper-realistic artistic portrait of a single human figure in an exceptionally creative setting. Incorporate surreal elements such as flowing fabrics, abstract shapes, or vibrant colors that interact with the subject. Experiment with dynamic poses that convey emotion and movement, and use unique props or artistic backdrops that enhance the overall composition. Focus on lifelike skin textures, intricate facial details, and authentic expressions. Utilize dramatic lighting and soft shadows to create depth and dimension, ensuring the final image is a stunning blend of artistry and realism, indistinguishable from human-made studio photography.

An artistic, high-fashion portrait of a woman standing in a studio, her pose a striking blend of elegance and movement. She is slightly bent forward, with her body arched, her arms extended as if reaching out to grasp something just beyond her reach, her fingertips delicately touching the air. Her head is tilted to one side, eyes focused downward with a contemplative, almost mysterious gaze. Her hair, styled in sleek waves, flows in a way that suggests wind or motion, despite being perfectly still. The lighting is dramatic, with a single spotlight highlighting her face and upper body, casting sharp shadows across her form, while the rest of the image fades into shadowy abstraction. Behind her, there is a backdrop of rippling, metallic fabric that seems to shimmer with hints of silver and copper, its texture evoking both fluidity and solidity. The scene is further enhanced by a subtle, reflective surface below her, where the silhouette of her body is distorted, adding a layer of surrealism to the realistic portrait. The overall composition balances tension and serenity, with a hint of surreal elegance, as though the woman exists both in the real world and an ethereal, otherworldly space.

A bold and artistic studio portrait of a confident, curvy model with striking red hair styled in a vintage updo. The model is wearing elegant, white with details, accompanied by sheer, flowing blue tulle draped like a veil. Tattoos on her arms and legs visible, adding an edgy and expressive look. The background is moody and atmospheric with light, soft clouds and subtle lighting. High-fashion editorial style, dramatic and creative composition.

An artistic, high-fashion studio portrait of a woman with striking silver hair, styled in a dramatic, asymmetrical cut, wearing a futuristic metallic outfit that gleams under the studio lights. The background is a deep, reflective black, with abstract geometric shapes subtly illuminated by soft, neon lights that cast a vibrant, colorful glow on her face. Her makeup is bold, with striking neon eyeliner and a shimmering highlight on her cheekbones. Her posture is strong, yet graceful, with one hand lifted slightly, as if reaching for something beyond the frame. The lighting is experimental, with sharp contrasts and bold highlights, creating intricate reflections and shadows on her metallic outfit. The atmosphere is sleek, modern, and a little otherworldly, as if she’s a figure from a future art exhibition, captured in an expertly staged, surreal moment of elegance and strength.

Example Images Real Photography

Privately sourced photographs by:

Anastasiya Pronchenko, Lary Rauh, Maja Elders, Timucin Mutlu

Assessment Scale items (excluding unused items)

1. I spend a great deal of time taking inventory of my positive and negative characteristics.
2. I like evaluating other people's plans.
3. I often compare myself with other people,
4. I often critique work done by myself or others.
5. I often feel that I am being evaluated by others.
6. I am a critical person.
7. I am very self-critical and self-conscious about what I am saying.
8. I often think that other people's choices and decisions are wrong.
9. When I meet a new person, I usually evaluate how well he or she is doing on various dimensions (e.g., looks, achievements, social status, clothes).