Rule-of-Thirds or Centered?
A study in preference in photo composition

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ABSTRACT

The Rule of Thirds is a well known heuristic in photo composition. The professional photography community both uses it and derides it. We report on an experiment to test the validity of the Rule of Thirds in the simplest case: composition of a single object. Our results show that our participants overwhelmingly preferred a centered object in the image to one positioned according to the Rule of Thirds. We speculate why this is so and point to other research that addresses how we can take advantage of this "salient centeredness".

CCS CONCEPTS

• **Computing methodologies** → **Image processing**; • **Human-centered computing** → *User studies.*

KEYWORDS

photo composition

1 THE RULE OF THIRDS

The Rule of Thirds is a well-known guideline in photographic composition. It posits that an image should be imagined as divided into nine equal parts by two equally spaced horizontal lines and two equally spaced vertical lines, with important elements then placed along these lines or at their intersections. It has been used as a guide in a great deal of computational aesthetics research [Datta et al. 2006; Dhar et al. 2011; Mavridaki and Mezaris 2015; Zhang et al. 2013]; indeed it is used more often than any other feature other than color [Hoh 2022; Hoh et al. 2023].

The Rule of Thirds has never been verified, nor has there been any investigation of whether there is an underlying perceptual mechanism that validates it. Professional practice is that the Rule of Thirds should be followed when it is useful and ignored when it is not ("experienced photographers compose instinctively rather than in a calculated way" [McManus et al. 2011, citing John Hedgecoe]).
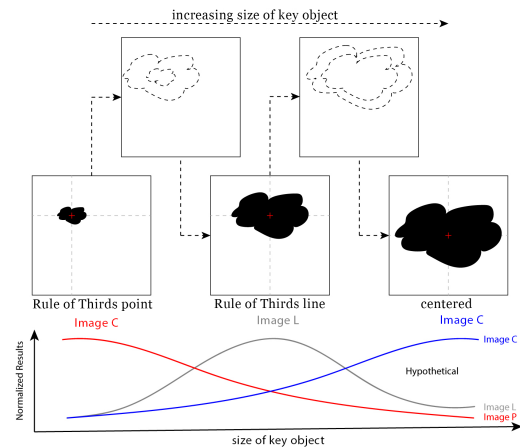
Figure 1: As an object gets bigger, we hypothesise that the preferred position will change from a Rule of Thirds point, to centered on a Rule of Thirds line, to centered in the frame.

On the basis of the Rule of Thirds, the authors proposed a hypothesis about the most preferential composition for different sizes of a single key object (or single close-spaced group of objects) in an otherwise uniform image. We work with a single key object because this is the simplest possible situation and allows us to test our hypothesis with a minimum of confounding factors. We present our hypothesis and the experiment that we used to test it. Our results show a clear preference for the object to be centered in the image, rather than being located at a Rule of Thirds line or point.

2 HYPOTHESIS

When composing an image that contains a single key object (or single close-spaced group of objects), we hypothesise that the size of the object is a factor in the optimal spatial positioning of the key object. During the first author's professional photographic career (spanning over 10 years), he created images believing that, in order to achieve aesthetically pleasing compositions with the Rule of Thirds composition guideline, as the size of the key object increases, the ideal position of the key object would shift from the Rule of Thirds intersection points to the Rule of Thirds lines and finally to the center of the image, as illustrated in Fig. 1(top). This leads to the hypothesis that the preferred composition will change as the object increases in size, as suggested in Fig. 1(bottom). Our experiment is designed to test this hypothesis.
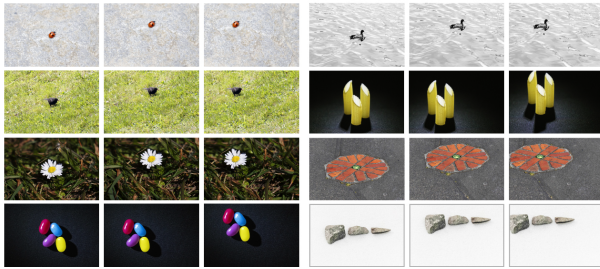
Figure 2: Eight of the stimuli sets used. In each case, from left to right: centered, Rule of Third line, Rule of Third point. Sizes are left column: 0.1, 0.2, 0.3, 0.5; right column: 0.2, 0.7, 0.7, 0.8.

3 EXPERIMENTAL DESIGN

We asked voluntary participants to assess 24 image sets of three images each. In each set they were asked to select the "most aesthetically pleasing" and "least aesthetically pleasing" images, in a three-way ranking. Experiment images were captured by the first author, each containing a single key object on a plain or textured background (cf. Konkle and Oliva [2011], who use a single object on a plain background). The 24 chosen images were cropped to create image triples, one with the key object at the image center, one with the key object at the top-left Rule of Thirds position, and one with the key object at the center of the top one-third horizontal line (Fig. 2). Objects had sizes ranging from 0.1 to 0.8 of the size of the frame (in increments of 0.1, measured one-dimensionally in the direction in which the object has the maximum size relative to the frame), so providing three example sets at each size, and allowing us to determine if there is any trend relating to size.

4 RESULTS & DISCUSSION

We recruited 117 voluntary participants (61 male, 50 female, 6 other). Of the 2,808 assessments, 64.1% selected the image with the key object at the center as "most aesthetically pleasing". The Clopper-Pearson interval for a random selection in a ternary-wise image comparison produces a 95% confidence interval of [56.2%, 71.3%]. This preference for centred is across all sizes. Fig. 3 shows that there is no evidence of the progression hypothesised in Fig. 1.

This demonstrates that there is no preference given to Rule of Thirds when considering composition of a single object against a plain or textured background, regardless of the size of the key object, and that our participants clearly preferred a centered composition. This has implications for any research that depends on the Rule of Thirds to provide a clear guideline as to what is aesthetically pleasing because the Rule of Thirds clearly does not work in the situation where there is a single key object.

This work raised two new hypothesis, which were worth exploring further. One is that the Rule of Thirds could be a learned rule within a professional community. That is, novice photographers learn that this is a correct way to compose photographs and, having learnt it, they then judge photographs by this Rule, so forming a self-perpetuating mythos within the community. We found some evidence for this in that other experiments [Hoh et al. 2023], where naïve participants preferred centered images to those selected as aesthetically pleasing by professionals (when referenced
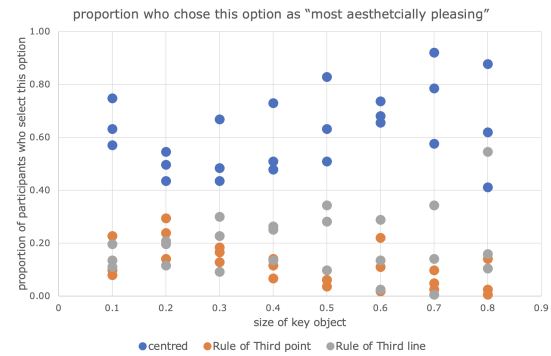

Figure 3: The proportion of participants who favoured each position for different sizes of key object. There are three sets at each size so three dots for each position for each size.

against the benchmarks developed by Wei et al. [2018] and Zeng et al. [2020]). There is thus evidence that trained professionals use different criteria in aesthetic judgements from naïve members of the general public. This should be taken into account when designing experiments and recruiting participants.

The second is a suggestion that the Rule of Thirds actually arises out of two simpler rules [Hoh et al. 2023]. These are: (i) the overall salient region of the image should be centered and (ii) the overall salient region of the image should take up about 71% of the image (measured either vertically or horizontally). The combination of these two rules, when there are multiple objects within the overall salient region, means that those objects often do get placed along the Rule of Thirds lines. The Rule of Thirds is thus valid for some compositions but not for others. That is, as the professionals advise [McManus et al. 2011], we should use the Rule of Thirds when it is appropriate and ignore it when it is not.

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