Investigating online liking behaviour for dance portraits on Instagram

What makes people press the 'Like' button and how can we make use of such data?

Universität Konstanz

Department of Psychology

Katja Thömmes & Ronald Hübner

✉ katja.thoemmes@uni-konstanz.de

Introduction & Research Questions

Introduction

In the digital century, people very commonly indicate what they like by clicking a 'Like' button on social media platforms such as Instagram. In the current project we investigate online liking behavior with respect to its usefulness in the field of empirical aesthetics [1]. Liking data for about 3,600 Instagram portrait photographs of dancers are analyzed. First, we examine the occurrence of Likes, concentrating on time and follower effects. Second, we run a series of experiments to collect experimentally controlled liking data for a subset of the dancer portraits and compare such liking data with Instagram Likes. Third, we use multiple linear regressions to reveal effects of image features on Likes, focusing on one content-related aspect (gender of the dancer) and one low-level feature of image composition (visual balance) [2]. For the latter, we also discuss differences between high-key and low-key photographs and their special importance for computing appropriate low-level measures for photographs.

Research Questions

RQ1. How do Instagram Likes emerge over time?

H_1: The longer an image has been online, the larger its number of Likes. (time effect)

H_2: The larger the followership of an account, the more Likes its images receive. (follower effect)

RQ2. Instagram Likes vs. Experimental liking

H_3: Instagram Likes relate to aesthetic liking in a controlled experimental setting.

RQ3. Predicting Instagram Likes

H_4: Instagram Likes can be predicted using objective image features of content and composition.

Methods

RQ1. Dancer Database and Instagram Likes

The Dancer Database

- 3,617 dancer photographs posted on four different Instagram accounts
- Corresponding meta data such as number of Likes, date of posting, size of followership

Account selection criteria

- Professional photographers with more than 30,000 followers on Instagram
- Consistent theme: portraits of dancers

Figure 1: Example photographs by Rachel Neville.

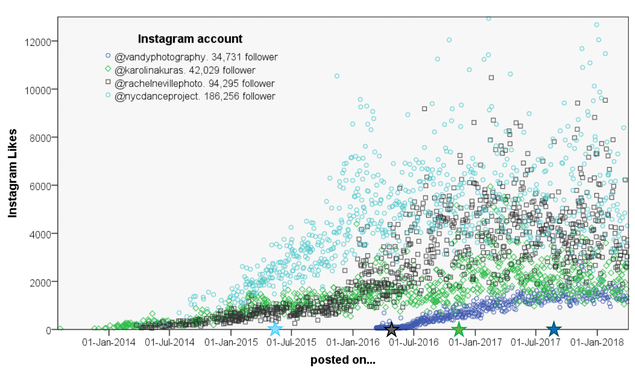

Figure 2: Number of Instagram Likes for each image.

RQ2. Aesthetic Liking

Study 1 – "Do you 'Like' or 'Dislike' this photograph?"

- 58 participants, 76 images
- 3 buttons: "Dislike" "I don't know" "Like"

Study 2 – "How much do you like this photograph?"

- 79 participants, 76 images
- Liking ratings: visual analogue scale (1 to 100)

RQ3. Content Classification & Balance Measure

Content Aspect 'Gender'

- 17 % only male dancer(s)
- 13 % mixed male/female
- 70 % only female dancer(s)

Compositional Feature 'Visual Balance'

- Distribution of masses [3]
- High-key images (see Fig. 3, left): dark pixels are perceptually 'heavier'
- Low-key images (see Fig. 3, right): bright pixels are perceptually 'heavier'

Figure 3: Examples for computed Centers of Mass based on bright vs. dark pixels as 'weight'.

Results

RQ1. How do Likes emerge over time?

H_1: The longer an image has been online, the larger its number of Instagram Likes.

- True, but only for the first couple of days.
- Numbers of Likes don't change much after images have been online for more than a week.

H_2: The larger the followership of an account, the more Likes its images receive.

- True. However, Likes seem to scatter rather independently, as accounts exceed 30,000 followers.

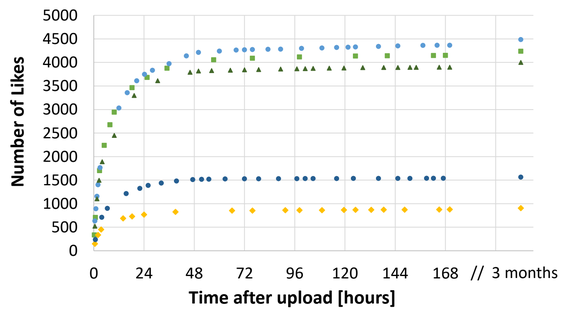

Figure 4: Development of Likes after an image is posted.

Table 1: Pearson Correlations, ** $p < 0.001$.

Account	Pearson r (Follower, Likes) Total	< 30,000 Foll.	> 30,000
@vandyphotography	.921**	.934**	- .072 n.s. ★
@karolinakuras	.787**	.813**	- .196** ★
@rachelnevillephoto	.755**	.809**	.213** ★
@nycdanceproject	.594**	.810**	.396** ★

RQ3. Predicting Instagram Likes

H_4: Instagram Likes can be predicted using objective image features of content and composition.

- For this analysis, we only use images that were posted after an account reached 30,000 followers (N = 1778 images, see H_2).
- Multiple linear regression reveals R^2 of 33.6 %** for the *account*, additional R^2 change for number of *followers* 6.4 %, additional 9.0 %** for *gender* of dancer, and additional 1.2 %** for visual *balance* resulting 50.1 % explained variance in Instagram Likes.
- Looking into accounts separately, effects of *gender* (5 to 18 %) and *balance* (3 to 6 %) increase with account size, see R^2 changes in Table 2.

Table 2: Multiple linear regression, changes in R^2 per variable

Account	N	Follower	Gender	Balance	Total R^2
Total (account R^2=.336**)	1778	.064**	.090**	.012**	.501**
@vandyphotography	101	-.005 n.s.	.015 n.s.	.037*	.057 n.s.
@karolinakuras	388	.038**	.073**	.027**	.139**
@rachelnevillephoto	564	.045**	.050**	.059**	.154**
@nycdanceproject	725	.157**	.176**	.027**	.360**

Note: ** $p < 0.001$ * $p < 0.05$

RQ2. Instagram Likes vs. Experimental liking

H_3: Instagram Likes relate to aesthetic liking in a controlled experimental setting.

- Instagram Likes were related to experimental 'Likes' (r = .460**) and 'Dislikes' (r = - .468**) of 58 participants.
- Instagram Likes were also related to liking ratings of 79 participants (r = .390**).
- However, experimental 'Likes'/'Dislikes' and liking ratings correlated more strongly (r = .813** and -.802**)

Note: All r are partial correlations, controlled for growing number of followers. ** all $p < 0.001$

Summary & Conclusion

Research Questions

RQ1. *Time effects*: After an image has been online for more than a week, # of Likes stabilize. ***Follower effects***: After an account reaches more than 30,000 followers, Likes scatter rather independently of follower growth.

RQ2. *Validation:* Instagram Likes relate to more common psychological variables such as experimentally collected 'Likes' and common liking ratings.

RQ3. *Modelling:* Taken together, 50 % of the total variance in Instagram Likes can be explained by account, number of followers, gender of dancer, and visual balance.

Future Research

→ We suggest using data of accounts with +30,000 followers and images that have been online for more than a week.

→ We find that Likes then relate to more common psychological variables, such as aesthetic liking.

→ We propose that when used in such a way, Instagram liking data can be a useful resource for investigating aesthetic theories in photography.

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References

[1] Thömmes, K., & Hübner, R. (2018). Instagram Likes for architectural photos can be predicted by quantitative balance measures and curvature. *Frontiers in psychology*, 9, 1050. https://doi.org/10.3389/fpsyg.2018.01050

[2] Hübner, R., & Fillinger, M. G. (2016). Comparison of Objective Measures for Predicting Perceptual Balance and Visual Aesthetic Preference. *Frontiers in psychology*, *7*, 335. https://doi.org/10.3389/fpsyg.2016.00335

[3] Wilson, A., & Chatterjee, A. (2005). The Assessment of Preference for Balance: Introducing a new Test. *Empirical Studies of the Arts*, *23*(2), 165–180. https://doi.org/10.2190/B1LR-MVF3-F36X-XR64

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