Black cats- does manipulation of photographs impact perceptions? A pilot study

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Background and Rationale

- Black cats take longer to get adopted than those with other coat colors
  - True regardless of the cat’s age or sex.
  - Additional time spent in a shelter is correlated with increased negative impacts on a cat’s health and welfare
- Current study - designed to test one potential intervention to reduce the length of shelter stay for black cats
Cat adoptions

- Many potential pet owners begin their search for an adoptable pet online.
- First impressions matter in terms of encouraging potential adopters to visit an animal in person.
- Data from Petfinder.com shows association between number of clicks on a cat’s profile and length of stay in shelter (Workman, 2015)
  - Cream-colored (lighter) cats had the most clicks per day and the shortest length of stay in the shelter.
  - Black/smoke colored cats had the least number of clicks per day, and the longest length of stay in the shelter.
Cat adoptions

- Cat body position in the profile picture does not affect the number of clicks received per day.

- Inclusion of toys
  - Clicked on more frequently than those without toys, even when the cat was not directly interacting with the toy.
  - Other props, (e.g., blanket/bed, decorative clothing) did not affect number of clicks per day. (Workman, 2015)
Online search

- 32.3% of adopters report beginning their search online
- Of those who viewed adoptable cats online, 50% reported viewing the profile of the cat they ultimately adopted
- 80% of adopters admitted that the cat’s Petfinder profile had moderately or strongly influenced their decision to adopt. (Workman, 2015)
Coat Color and Adoption Rates

- Overall consensus that cats with solid-colored black coats take longer to adopt than cats with primarily black coats, or even coats of other colors.
  - Black cats take average of 7 days longer to adopt than those of other colors (Stratton, 2014)
  - Black cats take 3 days longer to be adopted than cats with primarily black coats and 2-6 more days than cats of other colors (Kogan, 2013)
  - Black kittens take 2-3 days longer to be adopted than primarily black kittens and 2-4 days longer than kittens of other colors. (Kogan, 2013)
Personality traits and coat color

- Why do black cats take longer to adopt?
  - Perhaps personality traits attributed to cats based on coat color
  - Bi-colored cats more likely to be rated as friendly and less likely to be viewed as aloof when compared to orange, tri-colored, white or black cats. (Delgado, 2012)
Other Factors Influencing Adoption of Cats

- 26.9% of cat adopters cite behavior as the single most important reason for selection (Weiss, 2012)
  - Providing a toy for potential adopters to use when viewing a cat, and/or training cats to come to the front of their cage could be helpful interventions to highlight cats’ desirable behaviors
- The presence of toys attract visitors’ attention, which in turn leads to increased rates of adoption (Fantuzzi, 2010)
Extensive research has been conducted in this area, resulting in a variety of models. Most are based on Feaver’s (1986) three major factors of personality: alert, sociable and equable. Siegford (2003) developed broad temperament tests to measure a cat’s sociability, aggressiveness and adaptability. Feline-Ality test (ASPCA 2013) - designed to match cats with potential adopters based on the cat’s anticipated behavior in a home setting and the adopter’s expectations. Sorts on two dimensions: independence/gregariousness and valiance (boldness and response to novel stimuli).
Cat Personality Analysis

- Lee (2007) developed a four-factor model:
  1. active, clever, curious, and sociable
  2. emotional, friendly and protective
  3. aggressive and bad-tempered
  4. timid

- Bradshaw (2012) created a three-factor model:
  1. sociable, confident, easy-going, trusting, initiating friendly interactions, bold
  2. timid, nervous, shy, unfriendly
  3. aggressive and active
Study Design

- In this study, we asked participants to view photographs of black cats and tuxedo cats (as distractors).
  - Because the intent of this study was to assess potential interventions that might influence adoption of black cats, tuxedo cats were not included in analysis.
- Our hypothesis was that inclusion of a colorful prop would increase popularity and attention paid to photographs of black cats.
Research question:

- How does inclusion of a colorful prop (ribbon or toy) in online photographs affect perceived adoptability, for black cats?
Experimental conditions

Three different experimental conditions were selected

1. cat pictured alone
2. a toy included in the picture
3. a colorful ribbon around the cat’s neck
Photographs

- Obtained by asking cat owners to photograph their own pet cats, in a home setting
- Asked to photograph their cat alone, with a toy, and with a colorful ribbon
  - They were asked to use a solid-color backdrop, and keep all other elements (i.e. the cat’s position, lighting, etc) as constant as possible, across the three conditions
Methods

- Respondents were exposed to 6 cat pictures, randomly selected from the pool of 12 possible options.

- The survey was distributed via:
  - Amazon Mechanical Turk (AT)
  - Cat-oriented social media (Facebook) groups (FB)
<table>
<thead>
<tr>
<th></th>
<th>Social media/ Facebook (N= 1299)</th>
<th>Amazon Turk (N=734)</th>
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</thead>
<tbody>
<tr>
<td><strong>Gender</strong></td>
<td></td>
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</tr>
<tr>
<td>Male</td>
<td>65 (5.0%)</td>
<td>246 (33.5%)</td>
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<tr>
<td>Female</td>
<td>1222 (94.1%)</td>
<td>486 (66.2%)</td>
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<tr>
<td>NA/other</td>
<td>12 (0.9%)</td>
<td>2 (0.3%)</td>
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<tr>
<td><strong>Age</strong></td>
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<tr>
<td>18-25</td>
<td>224 (17.2%)</td>
<td>130 (17.7%)</td>
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<td>26-30</td>
<td>162 (12.5%)</td>
<td>143 (19.5%)</td>
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<td>31-40</td>
<td>265 (20.4%)</td>
<td>210 (28.6%)</td>
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<td>41-50</td>
<td>248 (19.1%)</td>
<td>124 (16.9%)</td>
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<tr>
<td>51-60</td>
<td>244 (18.8%)</td>
<td>83 (11.3%)</td>
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<tr>
<td>61-70</td>
<td>138 (10.6%)</td>
<td>38 (5.2%)</td>
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<tr>
<td>&gt;70</td>
<td>18 (1.4%)</td>
<td>6 (0.8%)</td>
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<tr>
<td><strong>Education</strong></td>
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<td></td>
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<tr>
<td>High school/GED</td>
<td>92 (7.1%)</td>
<td>86 (11.8%)</td>
</tr>
<tr>
<td>Some College/AA degree</td>
<td>390 (30.2%)</td>
<td>270 (37.1%)</td>
</tr>
<tr>
<td>4 year degree</td>
<td>511 (39.6%)</td>
<td>264 (36.3%)</td>
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<tr>
<td>Graduate degree</td>
<td>283 (21.9%)</td>
<td>102 (14.0%)</td>
</tr>
<tr>
<td>Other</td>
<td>15 (1.2%)</td>
<td>5 (0.7%)</td>
</tr>
</tbody>
</table>
Participants

Amazon Turk

Social Media

Age

- 18-25
- 26-30
- 31-40
- 41-50
- 51-60
- 61-70
- >70
Participants

Amazon Turk

Social Media
Participants

Amazon Turk

Social Media
Participants
Amazon Turk
Social Media

Marital status
- single
- divorced
- widowed
- married/partnered
- other

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- single
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Participants
Amazon Turk
Social Media
### Participants’ attitude towards cats

<table>
<thead>
<tr>
<th>Feel about cats</th>
<th>Amazon Turk</th>
<th>Social media</th>
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</thead>
<tbody>
<tr>
<td>Love cats</td>
<td>383 (52.2%)</td>
<td>1138 (87.6%)</td>
</tr>
<tr>
<td>Like cats</td>
<td>195 (26.6%)</td>
<td>114 (8.8%)</td>
</tr>
<tr>
<td>Cats are OK</td>
<td>110 (15.0%)</td>
<td>29 (2.2%)</td>
</tr>
<tr>
<td>I don’t really care for cats</td>
<td>36 (4.9%)</td>
<td>15 (1.2%)</td>
</tr>
<tr>
<td>I really dislike cats</td>
<td>10 (1.4%)</td>
<td>3 (0.2%)</td>
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Please rate how well the following words describe the cat pictured above:

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<tr>
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If you were in the market to adopt a cat, how likely would you be to adopt this cat?

- Extremely likely
- Somewhat likely
- Neither likely nor unlikely
- Somewhat unlikely
- Extremely unlikely
- I would never adopt any cat
Survey Example

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Results - Criteria and Demographics

- Responses from participants who indicated that they “really dislike cats” or “would never adopt any cat” were excluded from analysis, as these participants are not representative of our target audience.

- Because there were significant differences between the sample groups (AT and FB) on their reported feelings towards cats ($X^2 = 2431, p<.001$) the data from each group was analyzed separately.
The FB sample was more likely to report loving cats (86.1% compared to 53.1%) and less likely to state they did not care for or disliked cats (1.3% compared to 6.2%).

We hypothesized

- Data from the AT group might be more indicative of views held general public
- FB data might better represent the beliefs of cat ‘lovers’
Perceived adoptability - Amazon Turk

- The Kruskal-Wallis test was used to compare the three conditions on perceived adoptability.
- Statistically significant difference found between conditions (toy, ribbon and alone) \((H(2) = 23.84, p < .001)\)
  - Pairwise comparisons, adjusted by the Bonferroni correction:
    - Significant differences between ribbon and toy \((p = .007)\)
    - Significant differences between ribbon and alone \((p < .001)\)
    - No statistically significant difference between toy and alone
Perceived adoptability - Facebook sample

- A statistically significant difference was found between conditions (toy, ribbon and alone) \((H(2) = 23.87, p < .001)\)
- Cats photographed with a ribbon were rated as significantly more adoptable than cats pictured alone \((p < .001)\) or with a toy \((p<.001)\)
- There was no significant difference in the perceived adoptability of cats photographed alone or with a toy
Factor Analysis

- Why would adding a ribbon or toy positively influence how black cats are perceived?
  - We looked at the personality characteristics often used to describe cats to determine if a toy or ribbon influenced perceptions of these traits
  - To assess this, we conducted factor analysis to help us identify major trait categories for cats
Factor Analysis

- Asked about 12 adjectives based on research pertaining to cat personality.

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Factor Analysis

The 12 traits were examined using several criteria for the factorability of a correlation.

- Kaiser-Meyer-Olkin measure of sampling adequacy was 0.78 above the commonly recommended value of 0.6
- Bartlett’s test of sphericity was significant ($\chi^2 (28) = 14576.5, p < .001$)
- The communalities were all above 0.3 further confirming that each item shared some common variance with other items

Given these overall indicators, factor analysis was deemed to be suitable with the 12 items
Factor Analysis

- Principal components analysis was used
  - Initial Eigen values indicated that the first three factors explained 42.6%, 15.8%, and 13.7% of the variance respectively.
  - The three-factor solution, which explained 72.2% of the variance, preferred because of the ‘leveling off’ of Eigen values on the scree plot after three factors.
- The results confirmed the existence of three factors
Factors

- Factor 1 = “loving/friendly” consists of 4 items
  - Friendly, loving, sweet, likes to be petted
- Factor 2 = “demanding/aggressive” consists of 2 factors
  - Demanding and aggressive
- Factor 3 = “shy/quiet” consists of 2 items
  - Quiet and shy
- The remaining traits (playful, adventurous, active, and talkative) were excluded due to their high scores on more than one factor
Factors

- Additive scores for each respondent were calculated and standardized for each scale.
- Scores ranged from 1 to 5 for each factor.
- Higher scores indicated the trait described the pictured cat better than lower scores.
- Internal consistency for each of the scales was examined using Cronbach’s alpha.
- The alphas were adequate:
  - 0.91 for loving/friendly
  - 0.70 for demanding/aggressive
  - 0.60 for shy/quiet
Using these factors, we then explored whether the addition of a ribbon or toy influenced perceptions of these major trait categories for black cats.

Used general univariate analysis to examine the influence of condition (toy, ribbon, and alone) on each of the three major factors identified:

- friendly/loving, demanding/aggressive, and quiet/shy

Due to differences between the AT sample and the FB sample, they were analyzed separately.
Loving/friendly cluster

- **AT sample** - significant difference in perception of loving/friendly based on condition ($F = 72.20, p < .001$)
  - Post hoc analysis revealed the ribbon condition was significantly higher than other two conditions
  - Toy condition was significantly higher than the cat alone condition

- **FB sample** - significant difference in perception of loving/friendly based on condition ($F = 25.5 p < .001$).
  - Post hoc analysis revealed a significant difference between ribbon and the two other conditions - toy and alone.
  - There was no significant difference between alone and toy
Demanding/aggressive cluster

- AT sample - When the “demanding/aggressive” cluster was examined, cats photographed with a ribbon rated as less demanding ($F = 6.30, p = .002$) than cats pictured alone.
  - No difference between cats with ribbon and those with a toy
  - No difference between cats pictured alone and with a toy

- FB sample - rated cats photographed with a ribbon as less demanding/aggressive than those pictured alone ($F = 5.82, p = .003$)
  - No statistically significant difference between cats photographed with a ribbon and a toy, or between those photographed with a toy vs. alone
Shy/quiet

- AT sample - no statistically significant differences in the degree to which participants perceived cats as shy/quiet based on the condition.
- FB sample - participants rated cats photographed alone as more quiet/shy than those photographed with a ribbon or those photographed with a toy (F = 15.08, p < .001).
  - There was no statistical difference between cats photographed with a toy or ribbon on the perceived shy/quiet trait.
Discussion

In this study, we found that photographing cats with a brightly colored ribbon around their neck led to higher perceived adoptability for black cats.

This overall trend held true for both members of the general public, as represented by participants in the AT sample, as well as participants with a known affinity for cats, represented by the FB sample.
Potential explanations for observed changes

- Photographing black cats with ribbon:
  - Increased the degree to which they were rated as having desired personality traits (loving/friendly, etc) by cat lovers and the general public alike
  - Decreased degree they were rated as aggressive/demanding
  - Decreased degree they were rated as quiet/shy by FB sample (not AT)
Conclusions

- Potential tendency to project personality characteristics onto a person or animal from associated cues (clothing, toys, etc.)

- Ribbons introduce visual/color contrast into an otherwise dark area of a photograph.
  - This can help increase perception of a three-dimensional shape (Livingstone and Hubel, 2009), perhaps adding definition and appeal to a cat’s facial features

- Color can impact mood and perhaps also perceptions
Conclusions

- While previous research demonstrates that the presence of a toy can make black cats seem more appealing, in our study this effect was not as clear.
  - While addition of a toy made cats appear less demanding to both groups of participants, it did not influence how the FB sample rated the cats on the loving factor.
  - This area is worthy of further investigation.
Limitations and next steps

- Small number of cats photographed
- Variability in the cats’ poses across conditions
- Potential for a cat’s unique appearance to influence perceived adoptability

Next steps
- Photoshop
- Additional cats/colors
Questions/comments