Evidence-Based Behaviour Change Intervention on Saiga Horn Medicine in Singapore

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Key Points

- A rare example of a wildlife trade initiative that covers all stages of an evidence-based behaviour change intervention.
- Intervention development involved combining extensive consumer research with human behaviour theory and past research.
- Intervention used a cutting-edge, powerful combination of online news coverage and targeted advertising.
- Post-intervention, 4% of the target audience changed their behaviour (vs 1% of non-target) and the intervention message was shown as the key cause; but high-level users did not decrease significantly pre-to post-intervention.

Background

Interventions to combat demand for wildlife products rarely take a rigorous approach to the design, implementation, and evaluation of their work, unlike in other fields like public health. This limits their effectiveness and the transferability of insights gained, as well as wastes valuable resources. We set out to demonstrate how evidence-based interventions could

be implemented, from start to finish, using saiga horn products in Singapore as a case study.

The saiga antelope (*Saiga tatarica*) is a Critically Endangered species from Central Asia whose horn is used in traditional Chinese medicine (TCM) to treat fever and heatiness. Heatiness is a TCM state of illness with symptoms such as cough and sore throat. Singapore is a top saiga horn consumer country, and saiga horn products (marketed as líng yáng, 羚羊) are legal and widely available. In 2017, we began research on saiga horn consumption in Singapore, and in 2019 we implemented and evaluated a behaviour change intervention. For this work, we conducted all five stages characterising an evidence-based intervention. These stages are described below.

1. Empirical Evidence

The first stage is collecting detailed and reliable data on a behaviour of interest in a particular study system [see [here](#)]. We conducted 2,200+ consumer surveys, as well as multiple focus groups, all in-person with Chinese Singaporeans. This research was carefully designed to minimise response and survey bias. The data showed that 19% of Chinese Singaporeans considered saiga horn a product option they use most often for treating fever and heatiness. Middle-aged Chinese Singaporean women were among the largest consumer group and were the most likely to purchase

saiga horn for other people. Perceived efficacy and recommendations from others were the top stated reasons for using saiga horn. Lastly, saiga horn users were most likely to believe that saigas are a common species in the wild.

2. Comprehensive Understanding

The second stage is forming a comprehensive understanding of the study system by bringing together Stage 1 data with existing literature and human behaviour theories [see [here](#)]. We used past research and theory from social psychology, medical anthropology, and Singapore-specific studies to elucidate our Stage 1 consumer research. Through this comprehensive understanding we confirmed middle-aged Chinese Singaporean women were key players in saiga demand and were a feasible target audience for an intervention. Moreover, among the many interlinked influences affecting the target audience's saiga horn usage, their **societal-level perspectives of saiga horn** (i.e. that it is 'socially acceptable') and the **channels where they actively gain health information** (i.e. the news, online search platforms, and their social network) were both pivotal to behaviour change and feasible to leverage in an intervention.

3. Testing + Design

The third stage is to create, test, and refine a final intervention design [see [here](#)]. Based on Stage 2, we chose to: 1) use a **socially-framed message** around saiga horn; 2) have news articles be the message source; and 3) use online channels to spread the

message. Through additional focus groups we refined the specifics of these components. We found that the target audience **most trusted Singaporean news outlets** (particularly the Straits Times) and **Singaporean universities** (e.g. Nanyang Technological University), as sources of health information. The audience also used **Facebook and Google** for gaining and sharing health information. Lastly, the audience aligned with the societal identity that Singaporeans strive to be 'responsible' consumers. By using Singaporean news outlets and researchers to **'expose' saiga horn as coming from an endangered species**, we implied that saiga horn use contradicted this responsible consumer identity and was thus **no longer socially acceptable**.

4. Implementation

The fourth stage is to implement and monitor the intervention [see [here](#)]. Harnessing the powerful influences of **repeat message exposure, news spread, and social reinforcement**, we published an article in a top Singaporean news outlet, and used targeted adverts via Facebook, Google, and Outbrain (which sells 3rd-party adverts) to promote this initial news article and any subsequent articles. We also promoted older, unrelated web sources that corroborated our intervention message.

We used both advertisement performance data (e.g. the rate people clicked on the ads) and a sentiment analysis of Facebook user-created content (e.g. comments on ads) to monitor and assess message reception. These data gave us a sense of scale of the message spread (e.g. **the adverts were shown almost 5 million times**, and on Facebook alone our adverts reached 480,000 women). Additionally, the data showed that the audience was reacting to the message in a desirable way from a conservation perspective: **63% of content on Facebook was 'desirable'**, such as calls for the government to ban saiga horn, disgust for having unknowingly used an endangered species, and self-pledges to no longer use it. Only 13% of content was 'undesirable' such as the spread of misinformation or the promotion of saiga horn's perceived efficacy.

5. Evaluation

The final stage of the intervention is to evaluate any potential impacts [see [here](#)]. We conducted 2,100+ consumer surveys and 96 TCM shopkeeper surveys, all in-person, designed with the same robust approaches as Stage 1. We found that, post-intervention, saiga horn users in the target audience **stated they had stopped (or heavily reduced) using saiga horn products**

significantly more than other audiences (4% vs 1%). These consumers also **cited the intervention message** significantly most often as their reason for changing their behaviour. However, a significant **decrease in high-level saiga horn users was not observed** from pre- to post-intervention. Additionally, other behavioural drivers, like perceived efficacy and price, were stated to be more influential for some consumers. Across the behavioural sciences, heterogeneity in intervention impact is common, showing that different tactics work better or worse on different audience sub-groups. Similarly, interventions using media-type channels often have lower effect sizes than more personalised, or more sustained, approaches.

Conclusion

Our work provides a long-called-for example of a wildlife trade initiative that successfully carries out all stages of an evidence-based behaviour change intervention. It also showcases robust approaches to consumer research and evaluation. Lastly, it highlights how techniques that are already influencing global consumer behaviour (e.g. online advertising) can be creatively repurposed for conservation good.

References

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