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Scriptwriter Name: Deepthi Das

Project Page Link: https://review.jove.com/files_upload.php?src=21558973

**Title: How Virtual Celebrity Characteristics Drive Purchase Intention:
Testing the Stimulus - Organism - Response Framework with
Structural Equation Modeling**

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Author Questionnaire

1. **Microscopy:** Does your protocol require the use of a dissecting or stereomicroscope for performing a complex dissection, microinjection technique, or something similar? **No**
2. **Software:** Does the part of your protocol being filmed include step-by-step descriptions of software usage? **Yes**
3. **Filming location:** Will the filming need to take place in multiple locations? **No**
4. **Testimonials (optional):** Would you be open to filming two short testimonial statements **live during your JoVE shoot**? These will **not appear in your JoVE video** but may be used in JoVE's promotional materials. **Yes**

Eungkil JEON, Secretary General for Korea Trade Commission

Current Protocol Length

Number of Steps: 13

Number of Shots: 39 (39 SC)

Introduction

Videographer: Obtain headshots for all authors available at the filming location.

Authors: Please note that **the questions will not appear on screen**. Please answer in **stand-alone full sentence with sufficient context**.

Please note that statements were edited for length, clarity, and coherence.

INTRODUCTION:

~~REQUIRED: Summarize your research focus and the main questions it aims to answer.~~

- 1.1. **Eungkil JEON:** This study analyzes how virtual celebrity attributes influence consumer satisfaction, loyalty, purchase intention, and how personalization strengthens satisfaction-driven loyalty.

- 1.1.1. INTERVIEW: Named talent says the statement above in an interview-style shot, looking slightly off-camera

~~Describe the research gap or limitation in existing methods and how this protocol addresses them.~~

- 1.2. **Eungkil JEON:** Existing studies identify attractiveness and credibility but inadequately explain purchase outcomes; this study clarifies the mechanisms via SOR framework, mediation, personalization moderation.

- 1.2.1. INTERVIEW: Named talent says the statement above in an interview-style shot, looking slightly off-camera

CONCLUSION:

~~What does this protocol allow researchers to study or measure?~~

- 1.3. **Eungkil JEON:** The protocol can help measure how virtual celebrity attributes affect satisfaction, loyalty, and purchase intention using surveys and structural modeling.

- 1.3.1. INTERVIEW: Named talent says the statement above in an interview-style shot, looking slightly off-camera

~~Describe the most important consideration or challenge when performing this protocol.~~

- 1.4. **Eungkil JEON:** In this protocol, key challenges included recruiting participants familiar with virtual celebrities and clarifying inconsistent relationships between satisfaction and purchase intention reported in prior studies.

- 1.4.1. INTERVIEW: Named talent says the statement above in an interview-style shot, looking slightly off-camera

~~How can future studies build on this work? Describe the questions or research directions that can be investigated next.~~

- 1.5. **Eungkil JEON:** This research facilitates future studies on emerging AI technologies, cross-cultural differences, and long-term effects of personalization and virtual celebrity traits.
- 1.5.1. INTERVIEW: Named talent says the statement above in an interview-style shot, looking slightly off-camera

Videographer: Obtain headshots for all authors available at the filming location.

Testimonial Questions (OPTIONAL):

Videographer: Please capture all testimonial shots in a wide-angle format with sufficient headspace, as the final videos will be rendered in a 1:1 aspect ratio. Testimonial statements will be presented live by the authors, sharing their spontaneous perspectives.

What problem in your field of research does your JoVE article address?

- 1.6 **Eungkil JEON, Secretary General, Korea Trade Commission** : As AI advances and social media expands, virtual celebrities are rapidly proliferating. Yet we still know little about how people accept them or how marketers can use them effectively.
- 1.6.1 INTERVIEW: Named talent says the statement above in an interview-style shot, looking slightly off-camera

What is the key takeaway you hope viewers remember after watching your video article?

- 1.7 **Eungkil JEON, Secretary General, Korea Trade Commission**: The key takeaway is that understanding human responses to virtual celebrities is essential for responsibly integrating evolving AI technologies into future marketing practices.
- 1.7.1 INTERVIEW: Named talent says the statement above in an interview-style shot, looking slightly off-camera

Ethics Title Card

This research was exempt from full institutional ethical review under minimal-risk guidelines, as it used an anonymous online survey without collecting personally identifiable information. Informed consent outlining the study's purpose, voluntary participation, and data use was obtained before participants proceeded.

Protocol

Videographer: Please always record an audio slate while filming each shot mentioned in the shotlist.

2. Sample Size Determination, Participant Recruitment, and Screening

Demonstrator: Eungkil JEON

- 2.1. To begin, define the structural model for partial least squares structural equation modeling or PLS SEM (*P-L-S-S-E-M*) [1]. Specify a maximum of 6 predictors for the endogenous constructs, including 3 virtual celebrity characteristics and 3 control variables [2]. Set the statistical parameters such as medium effect size, significance level, and statistical power for the power analysis [3-TXT].

2.1.1. SCREEN: 07685_Screenshot_2.1.1.mp4: 00:00-00:15

2.1.2. SCREEN: 07685_Screenshot_2.1.1.mp4: 00:16-00:28

2.1.3. SCREEN: 07685_Screenshot_2.1.3.mp4: 00:05-00:18 *Video editor: if required please speed it up*

TXT: $f^2 = 0.15$, $\alpha = 0.05$, power = 0.80

- 2.2. Now, run the power analysis to estimate the minimum required sample size [1]. Confirm that the final dataset exceeds the minimum requirement to ensure adequate statistical power for structural, mediation, and moderation analyses [2].

2.2.1. SCREEN: 07685_Screenshot_2.2.1.mp4: 00:05-00:15.

2.2.2. SCREEN:: 07685_Screenshot_2.2.2.mp4: 00:05-00:10-00:30-00:35

Video editor: Please emphasize the number 249 in the total responses.

- 2.3. Recruit participants through an online research panel using purposive nonprobability sampling [1]. Restrict eligibility to individuals aged 18 years or older [2]. Insert screening questions and attention-check items in the survey to verify eligibility and response quality [3]. Review survey responses and remove entries that fail screening or attention-check criteria [4]. Stop data collection once the predetermined target sample size is achieved [5].

2.3.1. SCREEN: 07685_Screenshot_2.3.1.mp4: 00:05-00:15

2.3.2. SCREEN: 07685_Screenshot_2.3.2.mp4: 00:02-00:10

2.3.3. SCREEN: 07685_Screenshot_2.3.2.mp4: 00:05-00:08, 00:23-00:28

2.3.4. SCREEN: 07685_Screenshot_2.3.4: 00:01-end

2.3.5. SCREEN: 07685_Screenshot_2.3.5.mp4: 00:00-00:05. .

3. Survey Administration and PLS-SEM Analysis NOTE: The title has been changed

- 3.1. Start by presenting a definition describing virtual celebrities as digitally created audiovisual personas with stable visual identity, voice, and recurring narrative content [1]. Instruct participants to answer survey questions based on their actual experiences with such virtual celebrities [2].

3.1.1. SCREEN: 07685_Screenshot_3.1.1.mp4: 00:09-00:16

3.1.2. SCREEN: 07685_Screenshot_3.1.1.mp4: 00:00-00:08

- 3.2. Develop the questionnaire by including survey sections covering appearance, voice, content quality, satisfaction, loyalty, personalization, purchase intention, and demographics [1]. Measure all constructs using 7-point Likert scales where 1 indicates strongly disagree, and 7 indicates strongly agree [2]. Prevent duplicate submissions through platform control settings [3].

3.2.1. SCREEN: 07685_Screenshot_3.2.1.mp4: 00:00-00:12,

3.2.2. SCREEN: 07685_Screenshot_3.2.1.mp4: 00:13-00:20,

3.2.3. SCREEN: 07685_Screenshot_3.2.1.mp4: 00:21-00:28

- 3.3. Export the collected responses in comma-separated values or CSV (C-S-V) format [1]. Remove incomplete responses, failed screening responses, and failed attention check responses [2]. Import the cleaned dataset into PLS-SEM software for analysis [3].

NOTE: The VO is edited for the deleted shots, and the information is added as onscreen text at 3.3.1

3.3.1. SCREEN: 07685_Screenshot_3.3.1.mp4: 00:17-00:25 TXT: Import the cleaned data set into the PLS-SEM software

~~3.3.2. SCREEN: Display the dataset while filtering out incomplete or invalid responses.~~ NOTE: 3.3.2 and 3.3.3 are not filmed

~~3.3.3. SCREEN: Show the cleaned dataset being imported into the PLS-SEM software.~~

~~**4. Measurement and Structural Model Evaluation**~~ NOTE: Merge this chapter with the previous one

- 4.1. For measurement and structural model evaluation, specify all constructs as reflective constructs [1]. Evaluate reliability using Cronbach's alpha and composite reliability or CR (C-R) greater than or equal to 0.7 [2]. Assess convergent validity using average variance extracted or AVE (A-V-E) greater than or equal to 0.5 [3]. Evaluate discriminant validity using the Fornell-Larcker criterion and heterotrait-monotrait or HTMT (H-T-M-T) ratio and ensure that it is less than 0.9 [4].

- 4.1.1. SCREEN: 07685_Screenshot_4.1.1.mp4: 00:00-00:08
- 4.1.2. SCREEN: 07685_Screenshot_4.1.2.mp4: 00:05-00:15
- 4.1.3. SCREEN: 07685_Screenshot_4.1.3.mp4: 00:00-end
- 4.1.4. SCREEN: 07685_Screenshot_4.1.4.mp4: 00:00-end

- 4.2. Specify the structural paths according to the conceptual model and assess multicollinearity using the variance inflation factor or VIF (*V-I-F*) values below 5 [1]. Run bootstrapping with 5000 subsamples to estimate path coefficients, t values, confidence intervals, and effect sizes [2].
 - 4.2.1. SCREEN: 07685_Screenshot_4.2.1.mp4: 00:00-end
 - 4.2.2. SCREEN: 07685_Screenshot_4.2.2.mp4: 00:11-00:20

- 4.3. Estimate indirect effects using bootstrapping with 5000 subsamples and 95 percent confidence intervals [1] to test the sequential mediation from virtual celebrity attributes to satisfaction, satisfaction to loyalty, and loyalty to purchase intention [2].
 - 4.3.1. SCREEN: 07685_Screenshot_4.3.1.mp4: 00:05-00:16
 - 4.3.2. SCREEN: 07685_Screenshot_4.3.2.mp4: 00:11-00:18

- 4.4. Create interaction terms to test the moderating effects of personalization [1]. Estimate moderation coefficients and effect sizes using bootstrapping. Generate interaction plots to visualize conditional effects [2].
 - 4.4.1. SCREEN: 07685_Screenshot_4.4.1.mp4: 00:00-00:10
 - 4.4.2. SCREEN: 07685_Screenshot_4.4.1.mp4: 00:10-00:18
 - 4.4.3. ~~SCREEN: Show the generated interaction plot illustrating conditional relationships.~~ NOTE: Not provided

- 4.5. ~~Assess predictive performance using blindfolding or out-of-sample prediction procedures [1].~~ After predictive performance assessment, compare Q-squared predict values, root mean square error, and mean absolute error against a linear benchmark model [1]. Confirm predictive relevance when Q-squared predict values exceed zero, and PLS (*P-L-S*) errors are lower than the benchmark [2]. NOTE: The VO is added for the deleted shot

~~4.5.1. SCREEN: Show predictive analysis settings including blindfolding or out-of-sample prediction.~~ **NOTE: Not Filmed**

4.5.2. SCREEN: 07685_Screenshot_4.5.1.mp4: 00:00-00:11

4.5.3. SCREEN: 07685_Screenshot_4.5.1.mp4: 00:11-00:15 **TXT: Compile and verify all analysis outputs with software for accuracy**

~~4.6. Compile reliability, validity, structural, mediation, moderation, and predictive analysis outputs for reporting [1]. Cross-check all reported values with the software output to verify accuracy and consistency [2].~~ **NOTE: Not filmed. The information in the VO is added as an onscreen text in the previous step**

~~4.6.1. SCREEN: Show compiled results tables prepared for reporting.~~

~~4.6.2. SCREEN: Display side-by-side comparison of reported results and software outputs for verification.~~

5. Troubleshooting and Model Adjustments **NOTE: Not filmed**

~~5.1. Review the screening outcomes and refine eligibility criteria or survey instructions if screening failures are high [1]. Check if CR is more than or equal to 0.7 and AVE is more than or equal to 0.5 for all constructs [2]. Remove poorly performing indicators while maintaining theoretical consistency if the values fall below these thresholds [3]. Examine VIF values for predictor variables and reassess construct specifications if VIF exceeds acceptable thresholds [4]. Review mediation and moderation outcomes and reevaluate sample size or variable operationalization if effects are non-significant [5].~~

~~5.1.1. SCREEN: Show survey editing interface where eligibility criteria or instructions are adjusted.~~

~~5.1.2. SCREEN: Show the cursor hovering over the values of CR and AVE.~~

~~5.1.3. SCREEN: Show the removal of poorly performing indicators where the values fall below the CR and AVE thresholds.~~

~~5.1.4. SCREEN: Show the collinearity diagnostics (VIF values) for predictor variables used to assess multicollinearity.~~

~~5.1.5. SCREEN: Show the bootstrapping results table for mediation and moderation paths, highlighting the significance.~~

Results

6. Results

6.1. Reliability and convergent validity tests showed that all constructs exceeded recommended thresholds, confirming the measures are both reliable and valid [1-TXT].

6.1.1. LAB MEDIA: Table 3 **TXT: Threshold values: Cronbach' s $\alpha \geq 0.7$, CR ≥ 0.7 , AVE ≥ 0.5**

Video editor: Please highlight the columns corresponding to Cronbach' s α , CR and AVE.

6.2. Discriminant validity assessed using the Fornell-Larcker criterion [1-TXT] and heterotrait–monotrait ratio confirms that all constructs are empirically distinct [2-TXT].

6.2.1. LAB MEDIA: Table 4 **TXT: Threshold: Value < 0.90**

Video Editor: Please highlight the diagonal values, that is, the first entry in each column starting from the second column of the table. For reference, the values to be highlighted are 0.858, 0.785, 0.827, 0.877, 0.835, 0.881 and 0.912.

6.2.2. LAB MEDIA: Table 5 **TXT: Threshold: HTMT Value < 0.90**

Video Editor: Please highlight the diagonal values, that is, the first entry in each column starting from the second column of the table. For reference, the values to be highlighted are 0.659, 0.824, 0.665, 0.740, 0.702 and 0.655

6.3. Structural model evaluation indicates moderate explanatory power and acceptable predictive performance [1]. Predictive relevance is confirmed, with Q square predict values ranging from 0.280 to 0.485, all above zero [2]. The predictive performance of the PLS–SEM model is compared with a linear regression benchmark [3]. Lower root mean square error and mean absolute error values indicate better prediction accuracy [4].

6.3.1. LAB MEDIA: Table 6

6.3.2. LAB MEDIA: Table 6 *Video Editor: Please highlight the $Q^2_{predict}$ column.*

6.3.3. LAB MEDIA: Table 6 *Video Editor: Please highlight the PLS-SEM and LM columns.*

6.3.4. LAB MEDIA: Table 6 *Video Editor: Please highlight RMSE and MAE headers.*

6.4. Statistical analysis identifies which hypotheses in the model are supported by the data [1]. Appearance, voice, and content quality significantly influence customer satisfaction [2]. Satisfaction increases loyalty, which in turn leads to higher purchase intention [3]. Mediation analysis indicates that satisfaction affects purchase intention indirectly through loyalty [4]. Personalization strengthens the relationship between satisfaction and loyalty but does not affect purchase intention [5].

6.4.1. LAB MEDIA: Table 7 *Video Editor: Please show the whole table, briefly highlight the 'Accept' column.*

6.4.2. LAB MEDIA: Table 7 *Video Editor: Please highlight H1, H2, H3 rows.*

6.4.3. LAB MEDIA: Table 7 *Video Editor: Please highlight H4 and H6 rows.*

6.4.4. LAB MEDIA: Table 7 *Video Editor: Please highlight H5 row and then H6.*

6.4.5. LAB MEDIA: Table 7 *Video Editor: Please highlight H7a row, then H7b and H7c*

7. Endogenous

Pronunciation link: <https://www.merriam-webster.com/dictionary/endogenous>

IPA: /ɛnˈdɑːdʒənəs/

Phonetic Spelling: en·daa·juh·nuhs

8. Constructs

Pronunciation link: <https://www.merriam-webster.com/dictionary/construct>

IPA: /ˈkɑːnˌstrʌkt/ (noun), /kənˈstrʌkt/ (verb)

Phonetic Spelling: kon·strukt

9. Predictors

Pronunciation link: <https://www.merriam-webster.com/dictionary/predictor>

IPA: /prɪˈdɪktər/

Phonetic Spelling: pruh·dik·ter

10. Statistical

Pronunciation link: <https://www.merriam-webster.com/dictionary/statistical>

IPA: /stəˈtɪstɪkəl/

Phonetic Spelling: stə·tis·ti·kuhl

11. Significance

Pronunciation link: <https://www.merriam-webster.com/dictionary/significance>

- IPA: /sɪɡˈnɪfɪkəns/
Phonetic Spelling: sig·ni·fi·kuhns
12. Mediation
Pronunciation link: <https://www.merriam-webster.com/dictionary/mediation>
IPA: /ˌmiːdiˈeɪʃən/
Phonetic Spelling: mee·dee·ay·shuhn
13. Moderation
Pronunciation link: <https://www.merriam-webster.com/dictionary/moderation>
IPA: /ˌmɑːdəˈreɪʃən/
Phonetic Spelling: maa·duh·ray·shuhn
14. Purposive
Pronunciation link: <https://www.merriam-webster.com/dictionary/purposive>
IPA: /ˈpɜːpəsɪv/
Phonetic Spelling: per·puh·siv
15. Nonprobability
Pronunciation link: <https://www.merriam-webster.com/dictionary/nonprobability>
IPA: /ˌnɑːnˌprɑːbəˈbɪləti/
Phonetic Spelling: non·prob·uh·bil·uh·tee
16. Eligibility
Pronunciation link: <https://www.merriam-webster.com/dictionary/eligibility>
IPA: /ˌɛlɪdʒəˈbɪləti/
Phonetic Spelling: eh·luh·juh·bil·uh·tee
17. Audiovisual
Pronunciation link: <https://www.merriam-webster.com/dictionary/audiovisual>
IPA: /ˌɔːdioʊˈvɪʒuəl/
Phonetic Spelling: aw·dee·oh·vizh·oo·uhl
18. Questionnaire
Pronunciation link: <https://www.merriam-webster.com/dictionary/questionnaire>
IPA: /ˌkwɛstʃəˈner/
Phonetic Spelling: kwes·chuh·nair
19. Likert
Pronunciation link: <https://www.merriam-webster.com/dictionary/Likert>
IPA: /ˈlɪkərt/
Phonetic Spelling: lik·ert
20. Reliability
Pronunciation link: <https://www.merriam-webster.com/dictionary/reliability>
IPA: /rɪˌlaɪəˈbɪləti/
Phonetic Spelling: ruh·ly·uh·bil·uh·tee
21. Convergent
Pronunciation link: <https://www.merriam-webster.com/dictionary/convergent>
IPA: /kənˈvɜːdʒənt/
Phonetic Spelling: kuhn·ver·juhnt
22. Discriminant
Pronunciation link: <https://www.merriam-webster.com/dictionary/discriminant>

- IPA: /dɪˈskɹɪmənənt/
Phonetic Spelling: dih·skri·muh·nuht
23. Multicollinearity
Pronunciation link: <https://www.merriam-webster.com/dictionary/multicollinearity>
IPA: /ˌmʌltɪˌkɔːlɪˌnɪrɪˈæləti/
Phonetic Spelling: mul·tee·kol·uh·neer·ee·al·uh·tee
24. Bootstrapping
Pronunciation link: <https://www.merriam-webster.com/dictionary/bootstrapping>
IPA: /ˈbuːtˌstræpɪŋ/
Phonetic Spelling: boot·strap·ing
25. Coefficients
Pronunciation link: <https://www.merriam-webster.com/dictionary/coefficient>
IPA: /ˌkoʊɪˈfɪʃənt/
Phonetic Spelling: koh·uh·fi·shuhnt
26. Blindfolding
Pronunciation link: <https://www.merriam-webster.com/dictionary/blindfolding>
IPA: /ˈblaɪndˌfoʊldɪŋ/
Phonetic Spelling: blynd·fohl·ding
27. Predictive
Pronunciation link: <https://www.merriam-webster.com/dictionary/predictive>
IPA: /prɪˈdɪktɪv/
Phonetic Spelling: pruh·dik·tiv
28. Regression
Pronunciation link: <https://www.merriam-webster.com/dictionary/regression>
IPA: /rɪˈɡresən/
Phonetic Spelling: ruh·gresh·uhn
29. Operationalization
Pronunciation link: <https://www.merriam-webster.com/dictionary/operationalization>
IPA: /ˌɑːpəˌreɪʃənələˈzeɪʃən/
Phonetic Spelling: op·uh·ray·shuh·nuh·luh·zay·shuhn
30. Explanatory
Pronunciation link: <https://www.merriam-webster.com/dictionary/explanatory>
IPA: /ɪkˈsplænəˌtɔːri/
Phonetic Spelling: ik·splan·uh·tor·ee
31. Heterotrait–Monotrait
Pronunciation link: No confirmed link found
IPA: /ˌhetərəˈtreɪt ˈmɑːnəˌtreɪt/
Phonetic Spelling: het·uh·roh·trayt mon·uh·trayt
- 32.