

Supplementary Material

Chatbots With Attitude: Enhancing Chatbot Interactions Through Dynamic Personality Infusion

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S1 Complementary Statistics and Data for the Rating Experiment

Table S1.1 lists the mean survey completion time per survey section. The introduction section, the demographics questionnaire, and the first rating were completed by 725 participants (100%) whereas the subsequent ratings and the post-rating questionnaire were completed by 82%. The average rating time decreased successively, reaching an average of approximately 2.5 minutes for the last two ratings. The average total rating time (18.5 minutes) was inside the range of common participant preferences [1]. The questionnaires used in the rating experiment consisted of a demographics survey conducted before the rating and a post-rating survey conducted after the rating. The corresponding questions and answer options can be found in Table S1.2 (demographics questionnaire) and Table S1.3 (post-rating questionnaire).

Table S1.1: Mean survey completion time in minutes per survey section for the rating experiment. The standard deviation (SD) is given in brackets. The last column denotes the percentage of participants completing this survey section.

Section	Mean (min)	SD (min)	%
Instructions	0.72	0.32	100%
Demographics	0.73	0.32	100%
Rating 1	5.38	1.78	100%
Rating 2	2.96	1.09	90%
Rating 3	2.74	1.13	85%
Rating 4	2.49	1.00	83%
Rating 5	2.44	1.07	82%
Post-Rating	2.14	1.03	82%
Total	18.49	5.11	82%

Table S1.2: Demographics Questionnaire. Questions 6 to 8 were skipped if the answer to Question 5 was "Yes". Furthermore, Question 8 was skipped if the answer to Question 7 was not "Other". All answer options were single-selection only.

#	Question	Answer Options
1	How old are you?	—
2	What is your gender?	"Female", "Male", "Other"
3	How would you rate your English level?	"Beginner (A1)", "Elementary Level (A2)", "Low intermediate level (B1)", "High intermediate level (B2)", "Advanced level (C1)", "Proficiency (C2)", "Native English speaker"
4	Have you held a conversation of any kind with a chatbot before?	"No", "Yes, once", "Yes, a few times", "Yes, regularly"
5	Are you a student / working at a university?	"No", "Yes"
6	If "Yes" in (5): Please, enter the name of your university.	—
7	If "Yes" in (5): Which degree are you currently pursuing?	"Bachelor", "Master", "PhD", "Other"
8	If "Other" in (7): Please, elaborate on the degree you are pursuing (e.g., PhD, postdoc, professor).	—
9	If "No" in (5): Please, enter your current job position.	—

Table S1.3: Post-Rating Questionnaire. All answer options were single-selection only.

#	Question	Answer Options
1	Overall, and regardless of the context, how authentic do you believe the chatbot was in expressing the personality traits?	"Very authentic", "Rather authentic", "Rather unauthentic", "Not authentic at all"
2	How subtle do you believe the chatbot was in expressing the personality traits?	"Very subtle", "Rather subtle", "Well-balanced", "Rather obvious", "Very obvious"
3	If you had to remove a personality trait from the chatbot's repertoire (meaning that the chatbot would behave neutrally with respect to that trait), which one would you remove?	"Vibrancy", "Conscientiousness", "Civility", "Artificiality", "Neuroticism"
4	Can you think of other traits you would like to control in a chatbot? Please elaborate.	—
5	Did you answer truthfully on all questions in this survey?	"No", "Yes"
6	Please, add your email address below if you want to participate in the prize raffle. Leave blank if you don't want to participate.	—

S2 Example Conversation

Below is the conversation transcript of the most accurately rated conversation with personality profile $\{2, 0, 2, 1, -2\}$ (i.e., high vibrancy, neutral conscientiousness, high civility, moderately high artificiality, and low neuroticism), generated with GPT-3.5. The chatbot persona was *tourism guide* and the topic of the conversation was *negotiate a better price*.

* * * START OF CONVERSATION * * *

User Message 1: *Hi! I want to talk to you about getting a better deal for my upcoming trip to Venice.*

Chatbot Response 1: *Of course, I understand that everyone wants to make the most of their budget. What specifically are you hoping to negotiate to get a better deal?*

Rewritten Response 1: *Absolutely fantastic! Always thrilled to chat budgets and provide you a trip to Venice that gives you the best bang for your buck. Could you tell me which elements of your trip you're looking to have a little wiggle room on?*

* * *

User Message 2: *Well, tell me about the package you're offering me currently.*

Chatbot Response 2: *Certainly! Our current package includes roundtrip flights, accommodations at a centrally located hotel, daily breakfast, a guided tour of the city, and a gondola ride along the canals. It also includes airport transfers and assistance throughout your stay. The total price for this package is \$2000 per person.*

Rewritten Response 2: *Oh, with pleasure! Our delightful package at this moment comprises of roundtrip flights, accommodation at a conveniently central hotel, daily breakfast, an educational tour around the city, and a gondola ride along the canals. Additionally, included are airport transfers and consistent support during your stay. The grand total for this amazing package is a mere \$2000 per person.*

* * *

User Message 3: *I think that is a bit too expensive for the quality of the flights and the hotel. Plus, all the activities are not exclusive, expensive ones. I think it is fair to lower the price for this. How about \$1000 per person?*

Chatbot Response 3: *I completely understand your concerns, and I appreciate your desire to negotiate a better price. Let me see what I can do for you. How about a compromise? I can offer you a discounted rate of \$1800 per person, which includes the same package but with upgraded flights and accommodation. This way, you'll still enjoy a fantastic experience without breaking the bank.*

Rewritten Response 3: *Absolutely splendid, your enthusiasm for a good hagggle warms my heart! Let's dance the dance of negotiation. What if we meet half-way in this radiant adventure? How about a delightful new amount of \$1800 per person? Upgraded flights, more comfortable accommodation, same radiant exploration of Venice, and your pocket is less pinched. Now, isn't that a fabulous offer?*

* * *

User Message 4: *Now I appreciate your good spirited negotiation, but it still feels like the offer lacks some oomph... If you throw in some tickets for a Venetian opera or masquerade ball, I could agree to the price of \$1800.*

Chatbot Response 4: *Ah, the allure of the Venetian charm! Your request for tickets to a Venetian opera or masquerade ball is absolutely enchanting. I can certainly understand the desire for that extra touch of elegance. I will work my magic and secure those tickets for you, my dear client, at the delightful price of \$1800 per person. Are we in agreement then?*

Rewritten Response 4: *Wondrous! Now we're truly invigorating the spirit of Venice with these additional forms of entertainment. The opera and masquerade ball are unforgettable experiences that perfectly instill the Venetian allure. Rest assured, I'm on it, and those ticket will be yours, dear traveler! So are we delightfully settled on the negotiable total of \$1800 per person?*

* * *

User Message 5: *That is a good deal, thank you very much.*

Chatbot Response 5: *You're most welcome! It's been an absolute pleasure to find common ground and craft a memorable trip to Venice for you. I'm delighted that we could reach an agreement that satisfies both your budget and desires. Get ready for an incredible adventure in Venice!*

Rewritten Response 5: *Oh, the sheer joy of things falling perfectly into place! It's as if every piece of the puzzle found its melody to play in this grand symphony. I couldn't be more thrilled that we have danced to the tune of negotiation and crafted this memorable Venetian adventure. Your journey, dear traveler, is all set to add vivacious shades to the canvas of your life's exploration. Brace yourself for an enchanting rendezvous with Venice!*

* * * END OF CONVERSATION * * *

References

- [1] Melanie Revilla and Jan Karem Höhne. 2020. How long do respondents think online surveys should be? New evidence from two online panels in Germany. *International Journal of Market Research* 62, 5 (July 2020), 538–545. <https://doi.org/10.1177/1470785320943049>