

Online Supplement for Understanding and Predicting Users' Rating Behavior: A Cognitive Perspective

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This online supplement consists of 6 sections, section 1 presents experimental materials for the four groups, section 2 illustrates the computation details of attention mechanism, section 3 presents the visualization of attention over words and sentences in JuiceDB, section 4 lists the similar reviews in JuiceDB, section 5 presents the visualization of attention over words and sentences in TripAdvisor, section 6 lists the similar reviews in TripAdvisor.

1. Experimental Materials for the Four Groups

- The scenario presented to all four groups

Suppose if you are searching for a restaurant nearby, and you come across the following one consumer review for Keens Steakhouse from a review website.

Keens Steakhouse is a steakhouse restaurant located at 72 West 36th Street (between Fifth Avenue and Sixth Avenue) in the Garment District in Manhattan, New York City.

Table 1 Group 1 (Control Group)

Keens Steakhouse	
Overall Score	★★★☆☆ 3.8
Review Writers	Overall Rating
Kelly G. Brooklyn, NY 7/20/2018	★★★★★ 5.0
KeisMid, NY 7/18/2018	★★★★☆ 4.0
Bathyer, Taiwan 7/3/2018	★★★☆☆ 3.0
Nigel B, AZ 6/28/2018	★★☆☆☆ 2.0
FiGuy99, FL 6/13/2018	★★★★★ 5.0

Table 2 Group 2 (Aspect Ratings Only)

Keens Steakhouse			
Overall Score	★★★☆☆	3.8	
Service	★★★★☆	4.4	
Value	★★★☆☆	3.0	
Food	★★★★☆	4.0	
Review Writers	Aspect Rating		Overall Rating
Kelly G. Brooklyn, NY 7/20/2018	Service Value Food	★★★★★ ★★★★☆ ★★★★★	5.0 5.0 5.0
KeisMid, NY 7/18/2018	Service Value Food	★★★★☆ ★★★★☆ ★★★★★	4.0 4.0 5.0
Bathyer, Taiwan 7/3/2018	Service Value Food	★★★★☆ ★★★★☆ ★★★★☆	4.0 3.0 3.0
Nigel B, AZ 6/28/2018	Service Value Food	★★★★☆ ★☆☆☆☆ ★★☆☆☆	4.0 1.0 2.0
FiGuy99, FL 6/13/2018	Service Value Food	★★★★★ ★★★★☆ ★★★★★	5.0 3.0 5.0

Table 3 Group 3 (Written Reviews Only)

Keens Steakhouse

Overall Score ★★☆☆☆ 3.8

Review Writers	Content	Overall Rating
Kelly G. Brooklyn, NY 7/20/2018	We had a fantastic meal, great service, excellent quality of food. Our waiter was firstclass and gave us a history lesson on the building and the contents, full of amazing history and very comfortable environment. We were located upstairs in one of the small rooms which was lovely and quiet as when we arrived downstairs it was very busy. Food was great. We had filet steak which was mouth watering, could not fault the food. The price of some of the dishes were rather expensive bit this did not spoil our evening as it was for a special occasion. I would definitely recommend this restaurant for any history lovers or meat eaters!	★★★★★ 5.0
KeisMid, NY 7/18/2018	We managed to get a late table on a Sunday evening and it was still packed when we arrived at 9pm. The steaks were huge (or at least in comparison with what we are used to!) and were of a good quality. We had oysters to start which were excellent. The atmosphere is great, as is the decor. I'm glad they have managed to retain original features and make it feel like you are in a London Gentlemen only club (not in a seedy way!).	★★★★☆ 4.0
Bathyer, Taiwan 7/3/2018	The restaurant has a nice atmosphere, cool history and friendly staff. However, the food was just average and by the way, all the steaks are very, very large. The cost is also very high.	★★★☆☆ 3.0
Nigel B, AZ 6/28/2018	We are so disappointed in this restaurant. It was highly recommend by a friend. The food was mediocre. Considering the quality of the food, the prices are too high. The service was good but we went for a great meal - and we left very disappointed.	★★☆☆☆ 2.0
FiGuy99, FL 6/13/2018	We visited Keen's without daughter (who is a vegan) and son-in-law. We ALL loved our food. This was the biggest and best New York steak I have ever eaten. In fact, more, than half of it went to the hotel with me. My wife's petite Filet was as big as most full size filet anywhere else. All the sides were great, and I had the best baked potato ever. Our server, Thomas, was very friendly, and efficient. Like any Steak house, the prices were high, but \$49.00 for my New York Strip was quite reasonable. We will definitely return to Keen's on our next visit to New York.	★★★★★ 5.0

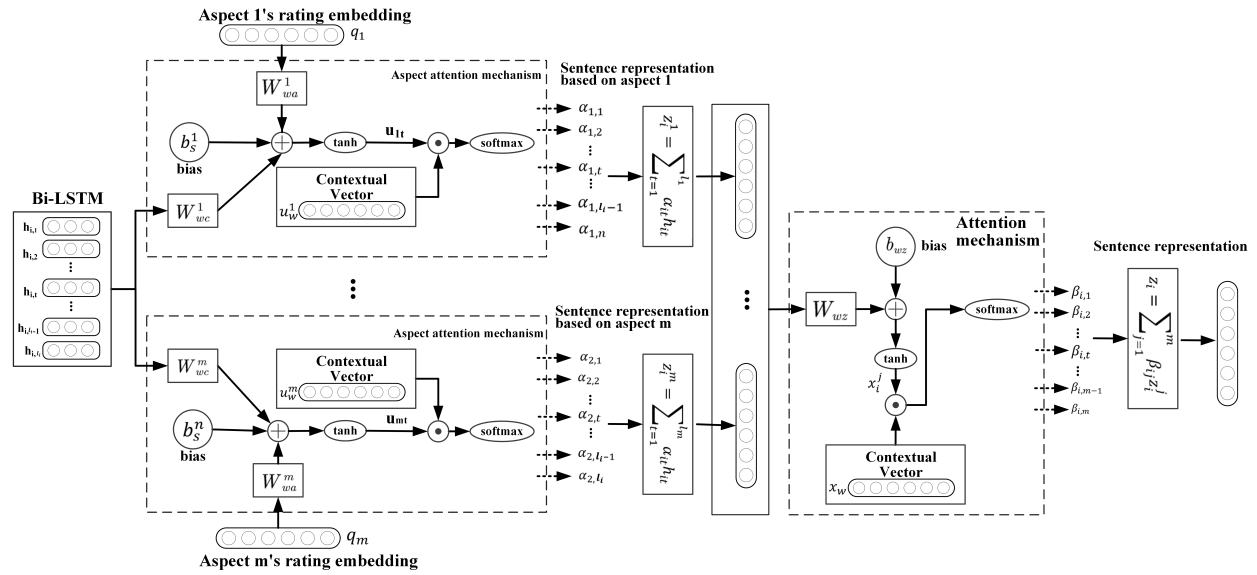
Table 4 Group 4 (both Written Review and Aspect Ratings)

Keens Steakhouse

Overall Score ★★★★★ 3.8

Review Writers	Content	Aspect Rating	Overall Rating
Kelly G. Brooklyn, NY 7/20/2018	We had a fantastic meal, great service, excellent quality of food. Our waiter was first class and gave us a history lesson on the building and the contents, full of amazing history and very comfortable environment. We were located upstairs in one of the small rooms which was lovely and quiet as when we arrived downstairs it was very busy. Food was great. We had filet steak which was mouth watering, could not fault the food. The price of some of the dishes were rather expensive but this did not spoil our evening as it was for a special occasion. I would definitely recommend this restaurant for any history lovers or meat eaters!	Service ★★★★★ 5.0 Value ★★★★★ 4.0 Food ★★★★★ 5.0	★★★★★ 5.0
KeisMid, NY 7/18/2018	We managed to get a late table on a Sunday evening and it was still packed when we arrived at 9pm. The steaks were huge (or at least in comparison with what we are used to!) and were of a good quality. We had oysters to start which were excellent. The atmosphere is great, as is the decor. I'm glad they have managed to retain original features and make it feel like you are in a London Gentlemen only club (not in a seedy way!).	Service ★★★★★ 4.0 Value ★★★★★ 4.0 Food ★★★★★ 5.0	★★★★☆ 4.0
Bathyer, Taiwan 7/3/2018	The restaurant has a nice atmosphere, cool history and friendly staff. However, the food was just average and by the way, all the steaks are very, very large. The cost is also very high.	Service ★★★★★ 4.0 Value ★★★★★ 3.0 Food ★★★★★ 3.0	★★★☆☆ 3.0
Nigel B, AZ 6/28/2018	We are so disappointed in this restaurant. It was highly recommend by a friend. The food was mediocre. Considering the quality of the food, the prices are too high. The service was good but we went for a great meal - and we left very disappointed.	Service ★★★★★ 4.0 Value ★☆☆☆☆ 1.0 Food ★★★★★ 2.0	★★☆☆☆ 2.0
FiGuy99, FL 6/13/2018	We visited Keen's without daughter (who is a vegan) and son-in-law. We ALL loved our food. This was the biggest and best New York steak I have ever eaten. In fact, more than half of it went to the hotel with me. My wife's petite Filet was as big as most full size filet anywhere else. All the sides were great, and I had the best baked potato ever. Our server, Thomas, was very friendly, and efficient. Like any Steak house, the prices were high, but \$49.00 for my New York Strip was quite reasonable. We will definitely return to Keen's on our next visit to New York.	Service ★★★★★ 5.0 Value ★★★★★ 3.0 Food ★★★★★ 5.0	★★★★★ 5.0

2. Computation details of attention mechanism



3. Visualization of attention over words and sentences in JuiceDB

0.2283 I really try to like this juice but the strawberry flavor is just **0.6203** **0.3725**
0.0119 I can taste the strawberry but where is the cream
0.0284 with a lot of imagination there is a little bit cream
0.1148 but **0.6635** not enough cream to save this liquid from a **0.0964** bad evaluation

4. Similar Reviews in JuiceDB

	Reviw Content
seed review 1	Very smooth, strong taste of strawberries and blueberry , creamy note rounds it out. Excellent all day vape.
similar reviews	Great fruit flavor. Great all day vape!
	Excellent flavor. Another great all day Vape.
seed review 2	just tasted typical...not what I expected
similar reviews	I taste a lot of cinnamon but that's about it nothing really special to it.
	A little too subtle for my taste, but by no means bad, just not my cup of tea.

5. Visualization of attention over words and sentences in TripAdvisor

0.3191 **0.0794** fab pizza at **0.1526** amazing prices
0.0473 we stood outside at 1 of a few tables provided and watched the world walk past !
0.3100 **0.0795** great value and felt **0.0773** authentic !

6. Similar Reviews in TripAdvisor

	Reviw Content
seed review 1	Excellent service and well cooked steak. Friendly and attentive staff. It is well worth a visit if in New York
similar reviews	Went here for an evening meal the service was excellent and the steak was superb . Lovely place has a great atmosphere. Reasonably priced excellent quality
	Great food, Great service, reasonable prices. It was an unexpected surprise. Authentic tasting, generous portions.
seed review 2	LOVED the food and the service! New York City trendy with high quality meats and preparations. I would highly recommend.
similar reviews	Loved they authentic food. Ravioli is one of the best. And the waiter John was really nice, I do highly recommend it
	We loved the mushroom and truffle oil, potato rosemary and grandma nonnina pizzas. Excellent service with a smile. Strongly recommend.