

TRUST MEASUREMENT FOR ONLINE AUCTIONS: PROPOSAL OF NEW MODEL

EL-SAYED M. TOWFEK EL-KENAWY AND ALI IBRAHEEM EL-DESOKY

Department of Computer and Systems Engineering
Faculty of Engineering
University of Mansoura
Elgomhouria St., Mansoura City 35516, Egypt
aboelsewood@yahoo.com

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ABSTRACT. *The research is a preliminary survey study of a trust model that integrates Bandura's triadic reciprocal causation model. Bandura's model is a social cognitive model that evaluates how a person's characteristics interact with behavior and environment. In this study the impact of feedback ratings input on the online auction site are considered in reference to the online auction buyer's trust. The buyer's propensity to trust matching the person component in Bandura's model; the ratings matching the institutional components and ethical behavior matches the Bandura's behavior component. Few studies are available on C2C compared to B2B and B2C. Trust models that can predict an online auction buyer's trust are important because their intention to buy and to return to the auction website is highly influenced by the buyer's feelings of trust. The respondents were asked to indicate their feelings to statements on a Likert five scale ranking system. The weighted average, validity and reliability were considered. The conclusions showed that higher distinctions are necessary between the items that respondents consider. This paper proposed a new model to measurement trust for online auction depending on personal behavior. The full study on the topic will use respondents from one online auction site instead of the random sampling used in the preliminary study.*

Keywords: Consumer-to-consumer, Trust model, Social cognitive modal, Bandura, Feedback ratings

1. Introduction. The United States Federal Bureau of Investigation explains that the issue of trust is related to Confidence Fraud which is defined as [1]. A breach of trust in an online auction involving the loss of money is the second most complaint to the FBI after non-delivery of goods [1]. Reliable measurements for trust of online auctions are both a business and a legal concern. Auction fraud amounted to 25.5 percent of the complaints received by the FBI in 2008 [1]. Globally, Eastern Europe is the location with the most reported Internet auction fraud [2]. The online venue for buying and selling makes the transactions convenient and easy for auctioning items, but reported instances of fraud negatively impact buyers' trust of the auction website such as eBay and Amazon [3].

Human Interactions. A survey carried out in the United Kingdom showed that of all internet users approximately 47 percent males and 47 percent females visited online auctions, indicating no measureable difference based on gender [4]. The number of individuals using the Internet categorized by age did not show a big difference between the three age groups: (a) under 15, (b) from 15 to 49 years and (c) from 50 to 64 years [4]. The largest category by age was from 15 to 49 at 49 percent while the smallest was the ages of 50 to 64 at 44 percent [4]. The results lead to the assumption that Internet users visiting online auctions are similar in terms of age and gender.

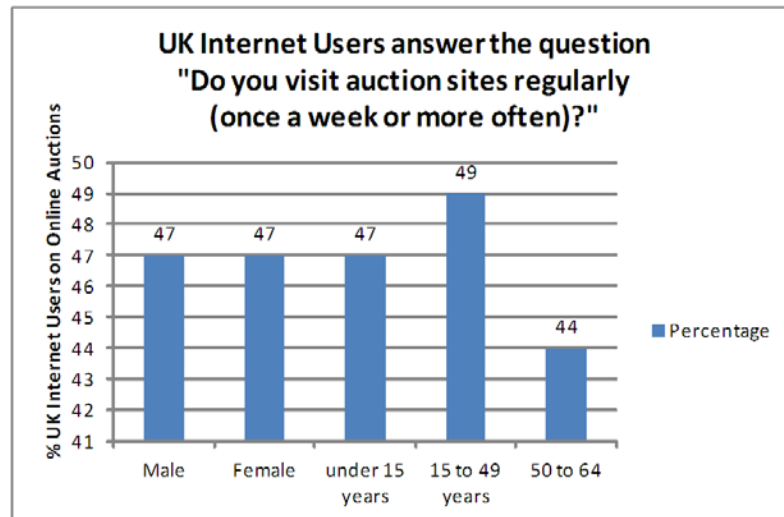


FIGURE 1. Online auction visitor demographics

Consumer-to-consumer (C2C) online auction selling is defined as the “ascending bid auction in which bids are open to all. Bidders can see high bids and comments in real time. The winner is the highest bidder and the price attained is the highest bid price” [3]. Risks are integral to each step of the online bidding process in a person-to-person transaction known as a C2C in accomplishing the business transaction [3].

1.1. **Registration.** The first step is the registration where sharing identification online is necessary. The seller can collect the information the buyer offers; but the buyer does not know how the seller will use the information or if the seller is able to collect more information from the computer [5]. The seller may share and distribute information with the third parties as a matter of business routine.

1.2. **Bidding.** The second step is the bidding. Online the individuals bidding cannot touch the sale item and cannot be sure if the item they will receive is the same as the one described by the seller [5]. Other risks are from shilling, additional charges, requests to go to another website and even triangulation (being covertly enticed to buy stolen merchandise) [5].

1.3. **Purchase.** One risk during the purchase process is that money will be paid but the item or items will never be delivered. Another risk is “escrow service fraud” when a seller convinces the buyer to go to a third party escrow service fraud to carry out the payment [5]. The supposed seller or buyer can prepare a fake escrow service site without the other party knowing the difference [5]. Payment is sent to the escrow service, but no merchandise is received. Or in opposite instance the seller sends the merchandise but never receives the payment this example happens at Eastern Europe as seller have not to pay all at once and can pay with wire transfers with no money transfer control number needed but one party has the others full name and full address [2].

2. **Related Work.** The frauds during e-auction processes reflect bad reputation for this auction and its participants, thus reducing the demand for these online auctions. Many studies discussed how to protect the participants from fraud using many techniques, one uses trust models to calculate each participant trust, the other one uses special comparable algorithms to predict that the auction users are trusted or untrusted, and some auctions

may use a third party like payment services as escrow services. These related works discuss these techniques [13].

2.1. Analysis for historical feedback deals. Some models historical feedback business deal is impersonal, and the activities taking place online are the result of human behaviors that can be used as trust measurements [14]. One study considered only the seller's perspective on trust for online selling. The researchers considered only online auctions while recognizing that sellers, the intermediary (such as eBay) and the buyers all have a unique point of view when deciding if they trust a site enough to use the site again. Cognitive and affective trust was integrated into the Motivational Model. Data from uBid.com was used to validate the results from the Model [14]. The results showed that online sellers display both cognitive and affective trust; trust transference was identified towards the buyers when the intermediary was trusted; trustful feelings are necessary for use and acceptance of an intermediary; sellers who enjoy using the site are the most likely to return often [14].

2.2. Trusted models using intelligent agent. The other studies discuss proposed trusted models that calculate the participants trust using intelligent agent technology as follows. Spares is a simple reputation mechanism that can be implemented irrespective of the number of ratings. There are basic principles provided by Sporas model services: the user reputation is built during its activity starting with minimum reputation value. No matter how unreliable the user is, the reputation value of a user does not fall below the reputation of a new user. The reputation value of the user is updated based on the feedback provided by the others to reflect the last trustworthiness. The system keeps the most recently submitted rating in case that two users may interact more than once. Smaller rating change happened with the users with high reputation value [15].

2.3. Feedback. Feedback rates previous users' experiences with comments and with ratings such as from satisfactory to unsatisfactory [6]. Only a small number of comments or ratings that are not honest can lead to misleading feedback that other users rely upon [7].

2.4. Ratings. Theoretically trust management can be enhanced by computing the Trust and Reputation System for an online auction site [7]. Trust management is necessary or users of online auction sites will continue to be victims of fraud. The purpose of trust management is to make certain that honest information is provided by both parties in a C2C transaction. Models are needed to predict whether or not the ratings reflect honest reactions. Unethical behaviors: unfair ratings can be too low and not accurately reflect the quality of an auction site [7]. Proliferation is unethical when one seller uses multiple websites pretending to be different sellers offering an equal product or service [8]. Another unethical action is when an attacker takes on multiple identities to make multiple inaccurate ratings [7].

Most models are developed on Business to Consumer (B2C) [9]. A structural trust model for C2C e-commerce was developed taking account of four points of view listed below built upon the B2C concept [9].

- (1) Personality (Does the individual have a "natural propensity to trust"?) [9].
- (2) Website features (What is the perception of the quality of the online auction's website?) perception of website quality (PWSQ) [3].
- (3) Point of view of the actors towards each other (Do the buyers trust the sellers and vice versa?) perception of website quality (PWSQ) [3].
- (4) Institutional feature point of view (Recognizing the third part) third party recognition (TPR) [10].

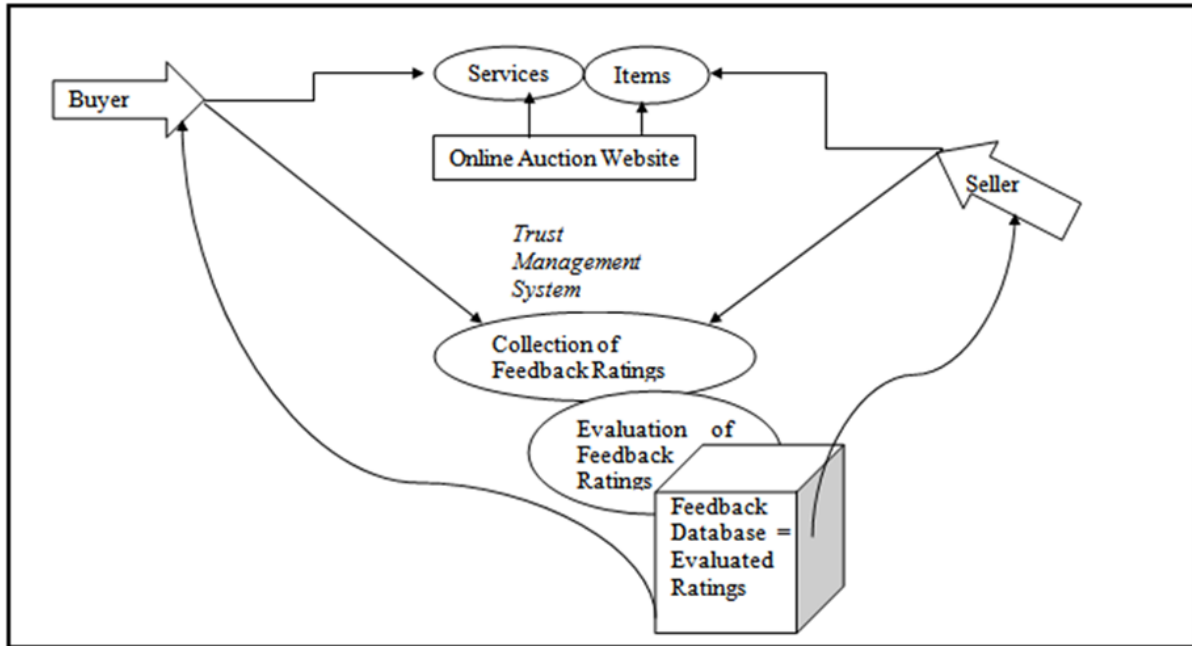


FIGURE 2. Trust management system

Gender and Age were used as control variables [9]. A two-part survey was developed; Part A was the demographic portion (nominal scales) and part B used a seven scale Likert with a range from ‘strongly disagree’ to ‘strongly agree’ [9].

“Trust crisis” can cause the consumers to reduce the times they visit and purchase from online sites [11]. A study of trust crisis focused upon the buyer’s trust of the website platform (for example, an online auction), of the sellers, and the trust to the online environment [11]. The research was conducted as a peer to peer or C2C study as opposed to B2B or B2C. The hypotheses were developed on the individual’s trust tendency, the correlation on C2C e-commerce sites between the ratings and feedback mechanisms, the third party influence on a buyer’s feelings of validity and to the seller’s character [11]. A Likert seven point scale was used with one representing ‘strongly disagree’ and seven representing ‘strongly agree’. Regression analysis showed that if an individual has a tendency to trust, it is most evident at the level of the network environment [11]. The variables of reputation feedback and the third-party payment are highly influential on a customer’s trust of the website [11]. The higher the reputation of a seller is, the higher the buyer feels confidence in buying from the seller. The researchers recommended looking more closely on communication interactions between the buyers and sellers and provide a well-designed way for buyers to offer feedback [11].

The online retailer was the focus of a cognitive and institutional predictor model of a potential buyer’s trust towards the retailer online [12]. The respondents to the survey style study number 477 U.S.A. households [12]. A model of initial trust was used to compare a retailer perceived as having a strong reputation to a retailer perceived as weak having a weak reputation. Initial trust was found to be influenced by a consumer’s cognitive and institutional beliefs about the retailer [12].

3. Theory of New Model. Several researchers have studied the effect of the environment surrounding an individual. Davies wrote: “People are neither deterministically controlled by their environments nor entirely self-determining. Instead they exist in a

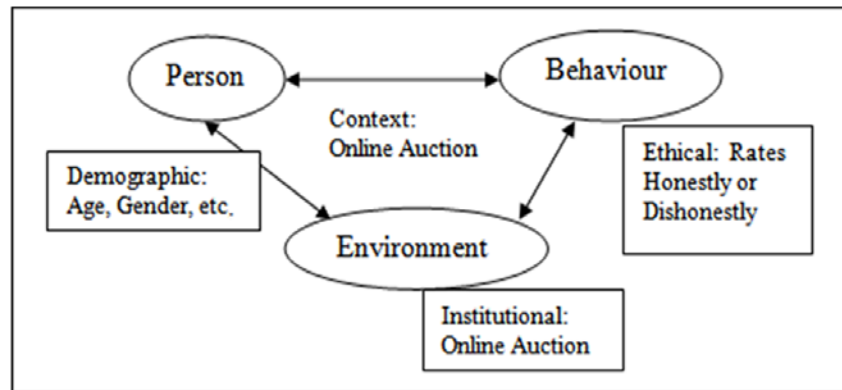


FIGURE 3. Bandura's reciprocal causation model in context of online auction

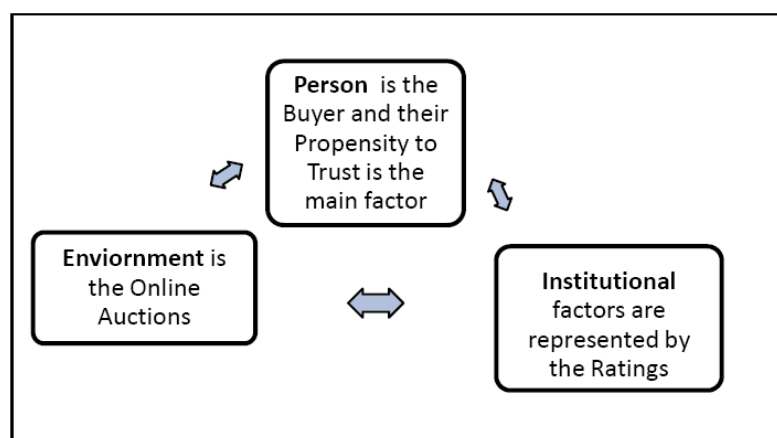


FIGURE 4. Proposed model for trust

state of reciprocal determinism whereby they and their environments influence one another in a perpetual dynamic interplay.” The model assumes the environments the online auction and the definition apply. Bandura explains psychosocial functioning in terms of a triadic reciprocal causation whereby an individual's internal psychological factors, the environment which they are in and the behavior they exhibit, and all operate as interacting determinants that influence one another bi-directionally.

The proposed strategy is to evaluate the social skills that influence trust and user's behavior. Bandura's model can be integrated into survey models to introduce the better rating system. The first step is devising a C2C model with the Bandura's model with a model to understand the behavior of buyers that was accomplished here.

- A person's propensity-to-trust indicates how willing the person is to depend on other people and new environments initially, and in new interactions the degree of trust is based on the propensity to trust. With experience other factors become, trust is influenced by whether or not the experience is good or bad.
- Institutional is defined as the ratings used by the site to reassure users of trustworthiness of the online auction. The model includes the perception of the benefit (optimistic that their expectations will be met; the individual trusts the site), perceived size (that the site is large like Amazon.com and eBay so the buyer can trust the site) and perceived reputation of the site.
- Behavior is assumed by the research to be based on ethical beliefs that lead the person to act honestly or dishonestly (as evaluated in the survey).

4. Hypothesis.

H1: A buyer's inherent tendency to trust positively influences their attitude to the online auction.

Inherent trust tendency is an internal character factor of the buyer that is assumed to be stable [11]. Each buyer has experienced the environment of online auctions in a unique way [16]. Previous research shows that a buyer has a high trust tendency this easier to discern [11]. H1 is designed to learn about the buyer's propensity to trust and their behavior on the environment of the online auction.

H2: A buyer is influenced by their perception of the validity of the ratings to the online auction.

The ratings on an online auction for a seller are a reflection of the seller's reputation [17]. The degree of trust of site's users is computed by online auctions and available on the online auctions. One positive point can be given by a buyer who is happy with the interaction on the site or one negative point if dissatisfied [11]. The institutional factor of the online auction website's ratings is assumed to act as a strong influence on the buyer, according to the perception of the validity of the ratings.

H3: The buyers who perceive the seller's behavior on the site as ethical will be the most likely to make more purchases on the site. The ethics of a seller are calculated by their ability to send the buyer the high quality item expected, a way to return merchandise, or to give warranties for their products. Ethical behavior is expected to be reciprocated [18].

5. Results. The participants were contacted from the LinkedIn website. Forty three respondents were finally used to calculate the results. The demographics of the group are listed below. Females have been found to purchase items from online auctions more than men.

The age group from other research also shows that buyers from 20 to 49 years are the largest purchasers from online auctions. Therefore, for the purposed preliminary study,

TABLE 1. Preliminary research demographics

<i>Total Respondents</i>	43
<i>Gender</i>	<i>Female</i>
	<i>Male</i>
<i>Ages</i>	< 20 years
	20 to 49
	50 to 65
<i>Education</i>	
≤ high school	12%
2 to 4 years college	51%
> 4 years college	37%
<i>Location</i>	
Living in U.S.A.	33%
Living in Europe	16%
Living in Canada	7%
Other location	44%
<i>Approximate amount spent in past 30 days</i>	
< \$200	43%
\$201 to \$499	26%
> \$500	29%

TABLE 2. Likert five-scale ranking

1	2	3	4	5
strongly disagree	disagree	neutral	agree	strongly agree

TABLE 3. Construct matched to item

Construct	Item
Tendency to Trust	
TtT 1	I trust the website because it is very big company known for online auctions.
TtT 2	I trust that my name and email are kept private on this site.
TtT 3	I think the sellers are trustworthy because I trust the online auction website.
TtT 4	I do not trust the seller until I have made a purchase without facing any problems
Validity of Ratings to the Buyers	
VoR 1	The ratings are an accurate reflection of the online auction
VoR 2	Reviewing the online auction's ratings made me feel better about using the website
VoR 3	I did not take the ratings of the online auction into account before my purchase.
VoR 4	I only look at the ratings on the individual sellers.
VoR 5	I decide whether or not to purchase an item after looking at the seller's ratings.
Perception of Seller's Ethical Behavior	
PSEB 1	I think that a seller is ethical if the ratings for the seller are high.
PSEB 2	The ratings of a seller tell me nothing about the ethics of the seller.
PSEB 3	If I receive good quality for the item I want, then I consider a seller as ethical.

the demographics fall into the commonly reported values in other researches on trust and on online auctions.

The survey used a five scale Likert ranking system. The weighted averages of the data from the completed responses were calculated so that the rankings can be compared.

The three constructs are matched to the items that use as the basis of the social cognitive reciprocal triadic causal model (see Table 3). The tendency to trust is the independent variable. The perception of the validity of the ratings and the perception of the seller's ethical behavior are the dependent variables because they are a reflection of the buyer's tendency to trust. Perceptions of validity and ethic are assumed to be closely related to the individual's predisposition (tendency) to trust. The items for the last two constructs are either related to the perception of the online auction or the seller because they are the components of the environment.

The four items TtT3, VoR2, VoR3, and VoR5 when graphed on a bar graph against the rating scale as weighted averages of the responses are equal to or above agreement. The strongest information from the graph indicates disagreement with the item that 'the ratings are an accurate reflection of the online auction' (VoR1); that is in contrast to the VoR2, VoR3, and VoR4 that indicate agreement with a range of feelings from 'ratings make me feel better', to 'I did not look at the ratings before my purchase', to 'I only look at the ratings of individual sellers'. The other items are clustered around the neutral rating (3) meaning that the random group acting as respondents from LinkedIn is not representative of an experienced group and in the next study the participant group needs to be more carefully targeted.

A statistical analysis of the descriptive statistics took into account the weighted mean, the standard deviation applied to the weighted mean, the composite reliability between the items in each construct and Cronbach's α to determine validity between the items. The standard deviations are for the main part large. The composite reliability found using Listrel is not between items like Cronbach's α , but instead demonstrates reliability

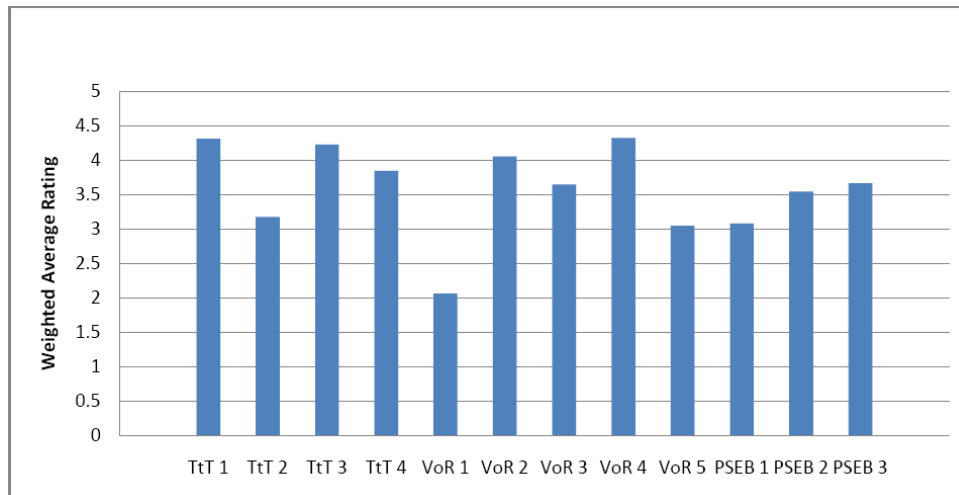


FIGURE 5. Construct items versus weighted average ratings

TABLE 4. Descriptive statistics

Items	Weighted Mean	Std. Dev.	Composite Reliability	Cronbach's α
TtT 1	4.31	0.56		
TtT 2	3.17	0.78		
TtT 3	4.23	0.73		
TtT 4	3.84	0.6	0.97	0.95
VoR 1	2.06	0.65		
VoR 2	4.06	0.88		
VoR 3	3.64	0.9		
VoR 4	4.32	0.72		
VoR 5	3.04	0.67	0.79	0.75
PSEB 1	3.08	0.69		
PSEB 2	3.54	0.78		
PSEB 3	3.66	0.72	0.92	0.89

between the latent variables and in the three cases it is high. Cronbach's $\alpha \geq 0.7$ is considered to be an indication of the internal consistency of the items within a construct. In that case the internal consistency is shown in all three cases. On the other hand the Cronbach's $\alpha = 0.95$ may indicate that the questions in the construct for tendency to trust may be too similar to one another.

6. Limitations. The research presents a preliminary survey to understand if Bandura's causal model can be applied to trust. The number of items between the constructs needs to be greater and the items need to show more differentiation. The participants for the survey were chosen from LinkedIn based only on their shared interest in online auctions. The number of respondents is small.

7. How Bandura's Model is Better than Other Models?

- No time imperatives. Offers can be set whenever (all day, every day). Things are recorded for various days giving purchasers time to search, choose, and offer. This comfort expands the number of purchasers.

- No geological imperatives. Vendors and purchasers can partake from anyplace that has web access. This makes them more available and lessens the expense of “going to” a sale. This builds the quantity of recorded things (i.e., number of vendors) and the quantity of offers for everything (i.e., number of bidders). The things do not need to be sent to a focal area, decreasing expenses, and lessening the dealer’s base worthy cost.
- Power of social connections. The social cooperation included in this procedure are fundamentally the same to staking. The purchasers hold up in reckoning trusting they will “win” (eBay calls the effective bidder the “victor”). Much like staking enslavement, numerous purchasers offer essentially to “play the amusement” instead of acquiring items or administrations. This makes an exceedingly faithful client portion for various websites like eBay or Amazon.
- Expansive number of bidders: In view of the potential at a generally minimal effort, the expansive extent of items and administrations accessible, the straightforward entry, and the social advantages of the closeout process, there is a huge number of purchasers.
- Large number of vendors: As a result of the expansive number of purchasers, the potential at a moderately high cost, lessened offering expenses, and simple entry, there is an extensive number of vendors [19].

8. **Future Research.** Future research will also require a second study to include sellers to the model and the third step of creating an entire model in order to evaluate the whole C2C process based on the effect of ratings on the behaviors of the users on online auction sites.

9. **Summary.** This preliminary study was a learning experience that is a good basis for a full research study integrating Bandura’s cognitive causation model with a model of buyers’ perceptions about trust and the ratings at online auctions. The next research project is to make a larger and more careful study by enlarging the number of items per construct and distinguishing between the items more carefully. After the buyer and ratings model is satisfactorily completed the next step is to include the sellers to better understand the affect of the ratings at online auctions sites. The number of participants needs to be enlarged and the demographics should include a question about the experience of the respondents on online auctions. The path of each hypothesis needs to be analyzed and will be more meaningful in a larger and improved study. The research can be enlarged to include linear regression analysis using the results of a Listrel analysis. The cognitive model offers insight into the perception of the buyers and that is important because the influence of ratings is different for each individual. The research assumes that the perception of the buyers to the ratings is what influences their behavior. The model needs to not only choose respondents with varying degrees of experience but also choose one online auction as the study site and carefully deconstruct the rating process on that site. The research adds to the knowledge of consumer to consumer behaviors.

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