

**Finding Love Online:
An Empirical Analysis of What Makes You Hot or Not**

Econ 4990, Senior Research Seminar

Finding Love Online

An Empirical Analysis of What Makes You Hot or Not

Introduction

Online dating has become an increasingly popular way for people to meet and match with other people. According to the Pew Internet and American Life Project conducted in 2006, approximately 11% of the adult, internet using population, or about 16 million people, have visited an online dating website. Even more importantly is that 18% of internet users age 18 to 29 are online daters, the largest proportion of any cohort group. With \$470 million in consumer spending in 2006, online dating websites generated more revenue than any other online content category. Leaders in the online dating industry, such as match.com and eharmony.com, cater to consumers across the country. Other online dating services provide users in specialized subgroups, for example particular ethnic or religious groups, with opportunities to meet and form relationships. As the internet has become a more widely used method of making a match with a significant other, researchers, and obviously online daters, have begun to take notice of what leads to success in the world of online dating.

The hotornot.com website allows users to post pictures and be rated by other users of the site. When posting a picture, it is possible to include a caption that tells the rater about yourself, or simply to post a picture and be rated on a scale of one to ten, one being the lowest level of attractiveness, or “not”, and ten being the highest rating of attractiveness, or “hot”. The site also provides the option for a picture to be posted with a method in which to contact the subject in the picture. This can be done simply by clicking

on the link “Click here to meet me” and the raters own personal information will be sent to the online account. To contact a member of the site, raters are required to register their own information, which is free and relatively fast. Hotornot.com is used by many as a conventional online dating site, but the ability to have users rate subjects purely on the basis of attractiveness, without any cost to the user, provides a unique opportunity for data to be collected on the ratings of attractiveness of online daters, which is a key component of success in the online dating market.

Section I of this paper reviews the related literature on online dating that has been done by other researchers in the field and provides a useful starting point for the work presented in this paper. In section II, the data is described and a model for the attractiveness ratings of both males and females from the website is presented. Also included are predictions of the effects of the tested variables on the attractiveness ratings of the subjects using prior empirical analysis and theory developed by other researchers in the field. Finally, in section III the model is estimated and the results are given with a discussion of how the results compare to the predictions made in section II.

I. Literature Review

The most comprehensive analysis of online dating is the paper by Hitsch, Hortacsu, and Ariely (2005). This study is based on the data of 23,000 users in the Boston and San Diego areas of an online dating service provider. The data collected were characteristics of the users of the site, including information on age, income, height, weight, educational attainment, ethnicity, religion, and relationship status, which was included in the user’s profile. Users also have the option to include a picture in their

profile, which 32% choose to do. The researchers were able to monitor users on whose profile they browsed, which pictures they viewed, who they were sending or receiving messages from, and which messages they replied to. In addition to this, the researchers were also able to scan messages of users for key words or phrases. By measuring the number of messages that include e-mails, telephone numbers, and phrases such as “let’s meet”, the researchers were able to collect additional data on determinants of success in the online dating market. As a measurement of success, the researchers used the number of first contact e-mails that were received by an individual user.

The results of the study were that the most significant factors in determining variability in the number of first contact e-mails received, and hence success, are attractiveness, income, educational attainment, and occupation, although these factors had different effects for men and women. The measurement of attractiveness has the strongest effect on the variability of first contact e-mails, accounting for 31% received by men and 44% received by women. To obtain a measurement of physical attractiveness, the researchers used the self-reported scores of the users who did not include a picture in their profile. These were qualitative ratings such as “above average” or “below average”. Approximately 68% of users did not include a picture in their profile. For the 32% of users who did include a picture in their profile, the researchers had 100 college students, 50 men and 50 women, view the pictures and rate the users on an attractiveness scale of one to ten, similar in format to the hotornot.com website, but not conducted online. For these ratings, it is reasonable to believe that the work of the anthropologist Jones (1995) on determinants of physical attraction, such as indications of youth, reproductive health, and facial neoteny, a combination of large eyes, small nose, and full lips, led to high

attractiveness ratings by the students. These scores were then used as the attractiveness ratings of the users who include pictures in their profile. It was found that all outcomes were monotonically increasing with looks in all measured outcomes and that this factor has the strongest correlation of all the explanatory variables to the number of first contact e-mails received. Men and women in the lowest rated group of attractiveness received about half as many e-mails as the “normal” group and users in the highest rated attractiveness group received approximately twice as many e-mails as the “normal” group.

There were also certain physical characteristics that were found to lower or raise a users score relative to other users. Men who are in the 6’3”-6’4” height range receive about 60% more e-mails than men in the 5’7”-5’8” range. Women, according to online dating users, also seem to have an ideal height, which is in the 5’3”-5’8” range. Researchers also collected data on users BMI, body mass index, which is a person’s weight, adjusted for height. It was found that online dating users prefer men with a BMI of 27, which is slightly overweight, and a woman with a BMI of 17, which is significantly underweight.

Other factors that were found to have a significant influence on success in online dating, as judged by first contact e-mails received, were a user’s level of income and educational attainment, although both of these factors have a much smaller effect than attractiveness, and the effect is different for men and women. For men, the effect of income increases monotonically for income levels above \$50,000. A man who makes above \$250,000 a year could expect to receive 156% more first contact e-mails than if he made less than \$50,000 a year. For women, the effect is much smaller. Women who earn

in the \$35,000-\$100,000 range receive slightly more e-mails than those who have lower incomes, but women who earn higher incomes do not receive significantly more first contact e-mails than those who earn moderate incomes.

Education was also found to be a significant factor in explaining the variability of first contact e-mails, although the effect of education is smaller than that of income, and again is different for men and women. For men, the attainment of higher education leads to greater success in online dating, whereas for women there does not seem to be a positive relationship. Men with college degrees receive 35% more e-mails than those with high school degrees. Women in their later years of college, or who are pursuing or have earned an advanced degree, seem to do slightly worse than women with lower educational achievement.

Although the research of Hitsch et al. (2005) provides a valuable perspective in the market of online dating, some of their methods are problematic. Many of the ratings of a user's attractiveness, the 68% who did not include a picture in their profile, are self-reported. The researchers point out that "users may lie about their true attributes". Because the online dating environment is a competitive market without mechanisms to enforce honesty, this statement should probably be interpreted as "users lie about their true attributes". With 20% of men and 24% of women self reporting "very good looks", 49% of men and women self-reporting "above average looks", and an unbelievably small 1% of users reporting "less than average looks", it seems that it would be reasonable to question the accuracy of these ratings. Also, as the authors of the study point out "Many of our readers will find some of our results sobering. Our fate in love and marriage seems to be driven by factors such as looks, height, weight, and income, that are hard or

impossible to change.” This is not entirely true, judging by the disproportionate amount of above average looking people possessing hair colors that have been shown to increase success in the dating market. So it does seem that there are strategies that online daters use to change their “fate” in love and marriage, but it is questionable just how honest these methods are.

The idea that agents will attempt to alter their looks to obtain some productivity enhancing effects is not a new one. Hamermesh, Meng, and Zhang (2001) examine the correlation between consumer spending on cosmetics and wages in the Chinese economy. Their analysis focuses on the fact that spending on cosmetics by households is a type of consumption, but that it also produces a productivity enhancing effect that in turn leads to higher earnings for the worker. The authors of the paper found that additional spending on cosmetics does have a significant, positive impact on a woman’s level of attractiveness, but that the marginal benefit decreases as spending on cosmetics increases. They also found that while this increased attractiveness produced small productivity-enhancing effects in the labor market through greater earnings, the larger majority of the spending represents consumption. The positive relationship between beauty capital and success in the labor market has previously been established by Hamermesh and Biddle (1994). What is unique about the work done by Hamermesh et al. (2001) is that it focuses on the returns that women are receiving for the alterations they are making to their looks through the application of cosmetics. This will allow for useful comparisons with these authors’ work and the findings in this paper. Again however, as with Hitsch et al. (2005), the actual attractiveness rating of the woman involved in the survey was determined exogenously, in this case by the sixty interviewers conducting the surveys.

In the paper by Fisman, Iyengar, and Simonson (2004), the authors come to a similar conclusion that physical attractiveness has a significant influence on mate selection, and that men weigh their mate selection more on physical attractiveness than women. They also find that women place more of an emphasis on the resources of a potential partner, such as income, intelligence, and education than men do. Again, however, the attractiveness ratings of the individuals are determined outside of the experiment, in this case by the research assistants, and then used to investigate success in the dating market.

While there has been a large amount of research by economists on the link between attractiveness and the competition for mates, and significant contributions by psychologists and anthropologists on the physical features that are deemed to be desirable in a potential mates, little has been done to determine how characteristics can be changed to increase success in the online dating world. In fact, the three major papers by Hitsch et al. (2005), Hamermesh et al. (2001), and Fisman et al. (2004) all use attractiveness ratings that were obtained exogenously from the model, mostly from college students or a handful of research assistants. This provides a unique opportunity to use the hotornot.com website to see not only how characteristics such as height, weight, education, and income, which cannot easily be adjusted, affect a person's perceived attractiveness in the online dating market, but also how online daters are presenting themselves differently to be perceived as more attractive. If the Becker (1973) marriage model is accurate, where matching is a frictionless process and potential mates need only reach some "quality threshold" to be successful, it would be greatly beneficial for studies to examine how competitive agents in online dating markets adapt to reach this quality cutoff.

II. “Hot or Not” Data and Model

The data used in the research of attractiveness ratings of users of hotornot.com were generated by using six subjects, three men and three women, and creating several different profiles on the site to allow users to “vote” on the attractiveness of each subject’s pictures. The pictures appear to viewers randomly, and are mixed in with thousands of other pictures so that the probability of a viewer seeing the same person twice is very small, and the probability of recognizing the same person from two different pictures is even less likely. Each subject had a base picture, in which all of the subjects were presented in identical environments. The pictures of the subjects were taken as they were seated, only allowing the subjects to be seen from the waist up. The background was the same for each subject, and between pictures of a single subject. Then a new profile was created for the subject, with a new picture testing a different variable.

For each subject, the only difference among each picture was the one tested variable that was altered. For the women, twelve pictures were taken, which were the base and eleven variables. For the men, ten pictures were taken, which were the base and nine variables. The variables tested for both men and women were the presence of alcohol, indication of religious affiliation, presence of a female, holding a guitar, wearing a wedding ring, smoking a cigarette, and having a tattoo. The variables that were tested specifically for women are not wearing make-up, presence of a male, wearing a revealing shirt, and wearing glasses. The variables tested specifically for males were wearing a hat and wearing a dress shirt and tie.

For convenience in the later discussion of the results of the model, these variables can be grouped into several categories. The first category includes the “lifestyle” variables. These are the alcohol, religious affiliation, smoking, guitar, and tattoo variables. The second category includes the “fashion” variables. This group is made up of the make-up, revealing shirt, glasses, hat, and dress shirt and tie variables. The last category are the “competition” variables, being comprised of the presence of a female, presence of a male, and wearing a wedding ring variables.

Also, for the purposes of this paper, the prediction of the expected effects of the tested variables are developed with the assumption that viewers are ranking subjects on their attractiveness as potential partners. This assumption is obviously not consistent among all viewers, but because of the parallel function of the site as an online dating service, this assumption is helpful in predicting and explaining the effects of each variable.

The presence of alcohol was achieved simply by having the subject hold a glass of beer. It is difficult to say how this variable is expected to effect a person’s attractiveness rating. On the one hand, it might influence viewers to believe that the subject is fun, engages in enjoyable social activities, etc. Alternatively, it could have a negative effect if viewers in some way hold a belief that the presence of alcohol in a picture posted online could indicate the subject possibly engages in activities that would make them seem less attractive as a partner, such as excessive drinking or an over importance of alcohol in their lives. This is a mainly empirical question, and the sign of the coefficient of this variable will determine which effect dominates. This variable was tested for both males

and females, and there is no reason a priori to believe the effect will be different between the two groups.

To indicate the subject has some type of religious affiliation, a picture was taken while the subject is casually holding a cross key chain. The cross was small enough not to dominate the picture, but large enough so that it stands out when quickly examining the picture. Again, the expected results of this variable is difficult to predict. This is because the results should depend on the opinion the viewer has toward religious affiliation, so in many ways, this variable is similar to the alcohol variable, only directed at a different viewing group. One thing that can be said about each of these variables is that they do provide the viewer with more information about the subject in the picture. This should therefore make them more or less attractive, depending on how the new information coincides with the personal beliefs of the viewer. It seems reasonable to believe that the results of these two variables should in some ways be similar to those found by Hitsch et al. (2005) for education, in which many viewers had a preference for partners with education levels similar to their own. Since we are testing this variable for both males and females, it is important to mention that while Hitsch et al. (2005) found some different preferences for education levels of partners between males and females, there is no reason to assume this heterogeneity between the sexes when it comes to religious affiliation. If this is true, then viewers with an affiliation to a religious group and who have a negative perception of alcohol consumption should rate the alcohol variable lower and religious affiliation variable higher than the subject's base picture. However, because it is impossible to collect data on viewer's characteristics, as was done in Hitsch et al. (2005), we cannot test whether this assumption is correct.

For the variable in which the presence of another female was tested, we simply positioned another female seated beside the subject. According to the rules of the hotornot.com site, the picture must clearly indicate which female is being rated. This not only ensures that viewers are voting on the correct female in the picture, but also that the picture does not significantly stand out from other pictures on the site in the way it was presented. Now, because of the presence of two women in the picture it could reasonably be expected that this variable would have a positive coefficient for the female subject, as men might see the presence of two women as a situation in which the chances of matching with at least one of the women is more likely, and so this situation is more attractive. Again, there is a problem in which it cannot be certain who is voting on the subjects. In Hitsch et al. (2005) and also Fisman et al. (2004), their data is collected using only observations from heterosexual viewers. It is important to remember that while the situation of an additional women might be seen as an increase in the likelihood of forming a match to a heterosexual male, it could be seen as increased competition, a possibility that will be discussed in more detail later, to a homosexual female. Although this should not have a large effect on the results given the proportion of homosexual to heterosexual people in the population, without knowing the characteristics of the viewers of the site we can only assume that this will not cause a significant problem.

For the male subjects with a woman included in the picture, the effect on the attractiveness rating is still expected to be positive, but for different reasons from those of the female subjects. The presence of a female in the picture with the male subject, where the relationship between the female and male is uncertain could possibly be seen as increased competition for the females rating the picture. If however, the correlation

between the presence of a female and the attractiveness rating of a male is positive, it is logical to see the female as an indication of the quality of the male. Fisman et al. (2002) explain, “The literature on mating markets in economics...which models marriage as a frictionless matching process. It is built on the assumption of a “quality threshold” rule where individuals are willing to match with partners above a quality cutoff.” Because of the asymmetrical information present in the online dating market, where viewers are exposed to risk through having so little information of those they are choosing whether to match with, the increased attractiveness of a male who is with a female might be a way for women to reduce their risk of choosing a male who is below their “quality threshold”. This is not to say that all of the female viewers have the same threshold, but simply that this additional information might increase the attractiveness of the male over those who give no indication other than their own looks as to their quality, and thus represent a lesser risk. An interesting research problem that could be addressed in the future would be to determine if the attractiveness of the female that is included with the male provides some indication to viewers as to the male’s quality. If this is the case, we would expect males who are shown with attractive females to be rated higher than those with a less attractive female because this might be a signal that they are meeting a higher quality threshold.

To test the effect of the presence of a guitar in the picture, the subjects were given a guitar, and they then held the instrument in the position in which it is typically played. This was convenient for comparison with the base picture in which the subjects were seated. The presence of the guitar and the perceived appearance that the subjects knew how to play the instrument gives viewers an indication of the subject’s interests, similar

to religious affiliation and alcohol consumption, but it is a more emotionally neutral activity than either of the previously mentioned interests. It is expected that a subject who is holding a guitar would be perceived as more attractive than their base picture, as it demonstrates that they possess an additional skill, such as musical or artistic talent, which could reasonably be expected to be helpful in the market for partners.

Similar to testing the variable for another female in the picture, it was also tested whether there is a significant effect of the presence of a male in the picture with the female subject. As discussed earlier, the rules of the site guarantee that it is clearly indicated that viewers know who is being rated in the picture and guarantees that the pictures tested for this variable do not stand out in a significant way from the others. By presenting the female in the picture in a way in which it is unclear what the relationship is between the male and the female, it is expected that when the male is included in the picture, females will suffer a significant penalty. The cause of this penalty is that as the female is perceived as having more options, represented as another potential partner, the cost to the male will increase through increased competition and the higher demand of the female. This leads to the female with another male being seen as a less attractive option, which would lead to a lower attractiveness rating. A similar argument could be made that the same reasoning that applies to the presence of a female with the male subject, in which the female might be an indication of the male's quality, also applies to a male with a female subject. The correlation on this variable with attractiveness rating in the soon to be presented model should determine which effect dominates in this case, the increased cost of competition or reduced risk through addition information.

A variable was also included in the model in which subjects were shown wearing a wedding ring on their left ring finger. The picture was taken to make the ring easily seen, but not make the picture seem unnatural and not change the subject's position from the base picture. The same expectations apply to this variable as those of the variables of the male with the female subject and a female with the male subject. It is expected that the males will receive an increased rating in their attractiveness because of an indication of their quality as they have found a wife who feels he meets her quality threshold, and females will receive a decreased rating in their attractiveness as males see the female as less attractive from the increased cost of competition. Again, the correlation on this variable with attractiveness for the males and females in the model will suggest which effect dominates for each sex.

At the end of the experiment, the females removed all of their make-up and a picture was taken under conditions identical to the base. The relationship between the spending on cosmetics for women and the effect on their beauty capital has previously been established by Hamermesh et al. (2001). In their research, there was a positive and significant correlation between spending on cosmetics and the level of attractiveness of a woman. It is expected that this relationship will also apply to the application of cosmetics and a woman's attractiveness rating so that once a woman removes her make-up, she receives a penalty in her attractiveness rating.

To test the effect of wearing more revealing clothing on a females attractiveness rating, a variable was included in which the females are wearing a tank-top in their picture instead of a t-shirt. These pictures showed the females in the same body position as their base picture, but wearing more revealing clothing. It has been shown by the

anthropologist Jones (1995) that there is a strong male attraction to markers of female youth and physical health. Because all of the female subjects in this experiment were all between the ages of nineteen and twenty-two, it is expected that dressing in a way that exaggerates these cues of youth will increase the subject's attractiveness rating.

As a test for the effect of attractiveness ratings of both males and females when they were smoking cigarettes, a variable was include in the model to test this effect. The effect of this variable could be similar to alcohol, in that it could be taken as an indication of the interests and lifestyle choices of the subject. If viewers share these same lifestyle choices, then the subjects should experience an increase in their attractiveness rating as they indicate they smoke. If viewers see this as an unhealthy choice that they do not share, then the subjects should receive a lower attractiveness rating as they reveal the information that they smoke.

The effect of wearing glasses on attractiveness ratings was also tested for the female subjects. Glasses have been a solution for many people to improve their vision, but based on the availability and low cost of contact lenses at this point in time, the choice of a woman to wear glasses might indicate some type of fashion decision in which she feels they enhance her looks. In many ways the decision to wear glasses as opposed to contact lenses is similar to the issue examined by Hamermesh et al. (2001). While examining the correlation between household cosmetics spending and earnings, they argue that "this analysis typifies a general class of issues in which a household's spending both represents consumption and produces an increase in some productivity-enhancing characteristic. That in turn generates additional earnings for the worker-consumer." Although this experiment is dealing with individuals instead of households and the

productivity-enhancing characteristic is improved vision and attractiveness in the mating market, it is reasonable to believe that we can think of a woman's spending on glasses representing both consumption and a way of producing productivity-enhancing characteristics in both her vision and the mating market. Hamermesh et al. (2001) found that while some of a woman's spending on cosmetics is an investment that will be returned in the labor market, the large majority represents consumption. If a similar argument has been made regarding spending on fashionable glasses, the majority of the benefit will come through consumption and not on any productivity enhancing characteristic in the mating market, such as attractiveness. Another explanation, which is perhaps simpler than the previous argument, is that by wearing glasses, the woman might be perceived as more intelligent or studious. The prior work by Hitsch et al. (2005) involving the effects of a woman's education would suggest that if this were the signal that wearing glasses was sending, the result would be a negative correlation with attractiveness rating.

To test the correlation between having a tattoo and attractiveness rating, both the male and female subjects were given fake tattoos. The male's tattoos were placed on their neck and the female's were placed on their wrist. These locations on the subject's body were chosen both for their ability to be seen without changing the body position and angle of the camera from the base picture, and also to be as consistent as possible with common locations that males and females have tattoos placed on their bodies. Because the regression of male and female attractiveness ratings will be done separately in this model, the different location of tattoos between the sexes is not important. The expectation of the correlation between having a tattoo and rating of attractiveness is again

dependent on how the viewers perceive tattoos. It is possible that possessing a tattoo might again indicate a fun, exciting person, and therefore make them more attractive. It is also possible that it could indicate that that person makes different lifestyle choices and has different values than the viewer, and thus make the subject be perceived as less attractive. It is also possible that there is a different correlation between men and women, meaning that the sexes possibly interpret these signals differently.

Variables that were tested only for men were wearing a hat and wearing a dress shirt and tie. Predicting the effect of wearing a hat on attractiveness ratings is a similar problem to that of predicting the effect of women wearing glasses on attractiveness rating. The hat does serve some productivity enhancing purpose (shelter from sun and rain), but for most males it is predominately a consumption item. If that is the case, we would expect that the correlation with attractiveness ratings is positive, given that if it wasn't, males would probably learn that if they want to attract women they should take their hats off. Although the correlation between wearing a dress shirt and tie on attractiveness ratings has not been concretely established, there has been research done by Hitsch et al. (2005) on the effect of a male's income and their desirability as a partner. They found that the higher the income of a male, the more successful he performs in the online dating market. If viewers relate a subject who is wearing a dress shirt and tie as earning a higher income than if they were wearing the t-shirt that represents the base, then we could reasonably expect the correlation between this variable and a male's attractiveness rating to be positive.

Having defined all of the variables, a model can now be created in which the dependent variable is the attractiveness rating of the subject and the independent

variables are dummy variables of the previously described characteristics. Each model also includes two dummy variables that differentiate the overall attractiveness ratings of the two males relative to the base male and two females relative to the base female. The model can now be given as:

$$\begin{aligned}
 RATING_f = & c + \alpha_1 PERSON2 + \alpha_2 PERSON3 + \alpha_3 BEER + \alpha_4 CROSS + \alpha_5 GIRL \\
 & + \alpha_6 MAKEUP + \alpha_7 GUY + \alpha_8 GUITAR + \alpha_9 RING + \alpha_{10} SHIRT + \quad (1) \\
 & \alpha_{11} SMOKE + \alpha_{12} SPECS + \alpha_{13} TATTOO + \mu
 \end{aligned}$$

$$\begin{aligned}
 RATING_m = & c + \beta_1 PERSON5 + \beta_2 PERSON6 + \beta_3 BEER + \beta_4 CROSS + \beta_5 GIRL \\
 & + \beta_6 HAT + \beta_7 GUITAR + \beta_8 RING + \beta_9 SMOKE + \beta_{10} TIE + \quad (2) \\
 & \beta_{11} TATTOO + \mu
 \end{aligned}$$

P1= base female

P2= 1 if person 2, 0 otherwise

P3= 1 if person 3, 0 otherwise

P4= base male

P5= 1 if person 5, 0 otherwise

P6= 1 if person 6, 0 otherwise

Thus, equations (1) and (2) represent the attractiveness ratings of a female and a male, $RATING_f$ and $RATING_m$, respectively.

III. Model Estimation and Results

Using Ordinary Least Squares regression analysis, equations (1) and (2) can now be estimated, and values of the coefficients can be obtained. Although the data set is statistically a large sample with sixty six observations, it is a relatively small number of observations and so many of the estimated coefficients are statistically insignificant. By

expanding the existing data set by a factor of ten, we are able to obtain regression results in which the coefficients remain unchanged from the original regression.¹ The regression results of the model of the expanded data set for the female subjects is presented in table 1 and the results of the model for the male subjects is presented in table 2.

Table 1. Regression Results of Female Subjects

<u>Variable</u>	<u>Coefficient</u>	<u>t Statistic</u>
Constant	9.222***	96.96
Person 2	-4.842***	-77.75
Person 3	-1.025***	-16.46
BEER	-.533***	-4.28
CROSS	.133	1.07
GIRL	-.267**	-2.14
MAKEUP	-1.1 ***	-8.83
GUY	-.333***	-2.68
GUITAR	-.533***	-4.28
RING	-.467***	-3.75
SHIRT	.133	1.07
SMOKE	-.733***	-5.89
SPECS	-.767***	-6.16
TATTOO	-.600***	-4.82

* significant at the .10 Type I error level

** significant at the .05 Type I error level

***significant at the .01 Type I error level

¹ By increasing the number of observations, the absolute values of the t statistics become larger and thus the coefficients are more statistically significant without changing the expected value of the coefficients. The results from the expanded data set are what we would expect to find by collecting additional data.

Table 2. Regression Results of Male Subjects

<u>Variable</u>	<u>Coefficient</u>	<u>t Statistic</u>
Constant	6.166***	31.13
Person 5	1.45***	10.33
Person 6	.02	.14
BEER	-.867***	-3.38
CROSS	.400	1.56
GIRL	.500*	1.95
HAT	1.033***	4.03
GUITAR	1.167***	4.55
RING	.367	1.43
SMOKE	.467*	1.82
TIE	-.467*	-1.82
TATTOO	1.833***	7.16

* significant at the .10 Type I error level

** significant at the .05 Type I error level

***significant at the .01 Type I error level

The regression results of the model show several of the explanatory variables are significantly correlated to the attractiveness ratings of men and women. The coefficients on the dummy variables of person P2, P3, and P5 are significant, showing that there is a significant difference in the overall attractiveness rating of these subjects relative to the base male and base female.

Several of the variables tested in the model can be classified as “lifestyle” variables because they might suggest certain lifestyle choices or interests of the subjects. These would include the alcohol, religious affiliation, smoking, guitar, and tattoo variables. The coefficient of the dummy variable for alcohol is negative and significant for both men and women, indicating that hotornot.com viewers hold a negative perception of this activity. The coefficient of the dummy variable for the indication of an affiliation with a religious organization is not statistically significant for either group. For the smoking variable, the two groups had different results. For females, a subject smoking was negatively correlated with their attractiveness rating and for males, smoking

was positively correlated with their attractiveness rating. The regression results show that men and women also have different correlations between the presence of a musical instrument (guitar) and attractiveness ratings, indicating that the two groups place differing levels of importance on this skill. In the male group, the presence of a guitar was positively correlated and significant while in the female group it was negatively correlated and significant.

Many of the variables tested which can be grouped as “fashion” variables were also found to be statistically significant. This group would be made up of the make-up, revealing shirt, glasses, hat, and dress shirt and tie variables. The variable tested in which women removed their make-up was found to be negatively correlated and significant, which confirms the findings of Hamermesh et al. (2001). Surprisingly, the coefficient of the variable for women wearing more revealing clothing was found to be positively correlated with attractiveness rating, but not significant. This likely has to do with the structure of this particular experiment, where much of the variation in the attractiveness ratings of the female subjects in being “absorbed” by the dummy variables for persons 2 and 3. This hypothesis is supported by the fact that the absolute value of the t statistics of the coefficients of these variables was very large, being 77.75 and 16.46 respectively. The results might be different if more data was collected and this variable was more rigorously controlled for. This could possibly be accomplished by using a female subject group who possessed more homogeneous physical characteristics than did the females in this experiment.

The correlation between wearing glasses and attractiveness for the females is found to be negatively correlated and wearing a hat is found to be positively correlated

with attractiveness for the males. This is most likely explained by the fact that while hats can have some productivity enhancing purpose, they are mainly used as a fashion accessory by males to increase attractiveness (no one wears something to look worse). For the females who wear glasses, although contacts can be used, some females might prefer glasses to contact lenses because they do not have to be put in and taken out, and so continue to wear glasses even if there is a penalty in their attractiveness rating.

The last variable that can be thought of as a “fashion” variable for men is the dress shirt and tie variable, which was found to be negatively correlated and significant. This is probably because viewers did not make any connection between a male wearing a shirt and tie and having a high income. It is also possible that the viewers of the hot or not site are predominately in an age or social group, such as college students, that might not be concerned with the income of a potential partner, or simply that users are not concerned about the economic resources of someone they are not going to be dating.

For the group which can be distinguished as “competition” variables, comprising the presence of a female, presence of a male, and wearing a wedding ring variables, several were found to be significant. For males, the pictures in which a female was included with the male subject was found to have a positive and significant correlation. This supports the earlier argument that the presence of a female with the male provides information to the viewing female that the male has met a certain quality threshold for that female. This would reduce the risk of matching with the unknown male in the online environment, in which very little information other than a picture is available. For females, the presence of another female in the picture is negative and significant, suggesting that a viewing male does not see the presence of another woman as an

increase in the availability or likelihood of matching with the female. The correlation between the presence of a male and the attractiveness rating of a female is negatively correlated and significant. This can be best explained as above with the male representing increased competition for viewing males and so decreases the attractiveness of the female as a potential partner. Again, these explanations are given using the reasonable assumption that subjects are being evaluated on the basis of their attractiveness as potential partners for the viewers. This explanation is even more likely given the fact that the variable for wearing a wedding ring, possibly indicating competition, was found to be negatively correlated with the rating of attractiveness for females. Even more importantly, the coefficient for the presence of a male was $-.333$ and the coefficient for wearing a wedding ring was $-.467$ for women, which means the variable representing more competition for the male resulted in a larger penalty in attractiveness rating.

Conclusion

Several papers, including those by Hitsch et al. (2005) and Fisman et al. (2004), have established that the physical attractiveness of online daters is the single biggest component of success in the online dating market. Research conducted in 2006 from the Pew Internet and American Life Project has shown that online dating has become an increasingly popular method for men and women to find partners, particularly among young people. However, very little work has been done in which the attractiveness rating of a subject, the most significant determinant of success in online dating, is determined endogenously in an online dating environment. Anthropologists have found several physical characteristics that are likely to lead to success in the selection process of mates,

but the majority of traits that have been identified are not likely to be apparent in an online setting and even fewer can be altered to influence success without a serious commitment of time and money.

This paper uses the unique format of the website hotornot.com to generate data on the attractiveness ratings of six different subjects, three males and three females, over eighteen variables. By creating a model of attractiveness ratings with the data, it is possible not only to determine which characteristics lead to a high rating of attractiveness for online daters, but also how these users are altering their own characteristics to increase their probability of success in online dating. Lastly, this paper presents several areas in which further research can be conducted to provide more complete information on how people make choices regarding the attractiveness of potential partners in an online setting.

Bibliography

- Febrero, R., and P. Schwartz (eds.). 1995. *The Essence of Becker*. Stanford, California: Hoover Institution Press. pp 273-328.
- Fisman, R., S. Iyengar, I. Simonson. 2004. Revealed preference determinants of mate selection: evidence from an experimental dating market. Columbia University Graduate School of Business.
www2.gsb.columbia.edu/faculty/rfisman/dating_paper.pdf. (Accessed April 17, 2007.)
- Fisman, R., S. Iyengar, E. Kamenica, I. Simonson. 2005. Searching for a mate: theory and experimental evidence. Stanford GSB Research Paper Series #1882.
http://papers.ssrn.com/sol3/papers.cfm?abstract_id=678304#PaperDownload. (Accessed April 23, 2007.)
- Hamermesh, D., and J. Biddle. 1994. Beauty and the labor market. *The American Economic Review* 84(5): 1174-1194.
- Hamermesh, D., X. Ming, and J. Zhang. 2001. Dress for success-does priming pay?. University of Texas.
<http://www.eco.utexas.edu/faculty/Hamermesh/Beautystuff.html>. (Accessed April 17, 2007.)
- Hitsch, G., A. Hortacsu, D. Ariely. 2005. What makes you click: an empirical analysis of online dating. American Economic Association.
www.aeaweb.org/annual_mtg_papers/2006/0106_0800_0502.pdf. (Accessed April 17, 2007.)
- Jones, D., C. Brace, W. Jankowiak, K Laland, L. Musselman, J. Langlois, L. Roggman, D. Perusse, B Schweder, D. Symons. Sexual selection, physical attractiveness, and facial neoteny: Cross cultural evidence and implications. *Current Anthropology* 36(5): 723-748.
- Pew Internet and American Life Project. 2006. Online Dating.
http://207.21.232.103/pdfs/PIP_Online_Dating.pdf. (Accessed February 15, 2007)