

Psychological background underlying the quality of Croatian students' roommate relationship

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This study was created as a framework for the website *idealni-cimer.hr*, an internet interface that uses psychology-grounded instruments to help students find their suitable roommate within half an hour, making the roommate search quick and effective. The results of American research could potentially lead us to wrong conclusions when searching for an ideal roommate of a Croatian student, since findings seem to be culturally specific. A pilot study and the analyses of focus groups done on 120 Croatian students, suggested that personality is not the only predictor of satisfaction with the roommate relationship. Attitudes towards neatness and the life habits while in a shared apartment also proved to be important. Based on these findings, we designed and assembled a questionnaire and examined its diagnostic validity on a sample of 80 students who were living with a roommate at the time of the study. Analysis that included data of over 300 users of the *idealni-cimer.hr* interface suggested that the key determinants of roommate relationship satisfaction are attitudes towards neatness, several personality dimensions (conscientiousness, self-discipline, cooperation, extroversion, and neuroticism) and specific life habits (behavior concerning common living space, behavior concerning relationship to roommate, and bringing over guests in the common living space).

Key words: roommates, personality, life habits, attitudes, *idealni-cimer.hr*

Relationship with a roommate is an integral part of student's life. It is far from being unimportant who the person we will be sharing our life space with is, i.e., who will we hang out with most of our free time. Just like a romantic partner, roommate also falls into category of the closest interpersonal relationships (Pennington, 2004). Thus, if the choice of marital partner is the most important social interaction choice one makes in his lifetime, then choosing roommates—unknown people a person intends to live with throughout his or her study—is also among the most important life decisions an individual has to make in the area of interpersonal relationships.

Just like the romantic one, a turbulent roommate relationship can easily lead to accumulation of stress. Accord-

ing to Subotić (1996), the most common consequences of stress are body symptoms, changes in behavior, emotional consequences, and cognitive difficulties. The most common cognitive difficulties have to do with memory and concentration, ambiguity and confusion in thinking, indecisiveness, significant altering in opinions/attitudes on people, life, future, catastrophic expectations, and the like. Such cognitive disturbances can easily affect academic success of a student, and recent studies indicate that close interpersonal relationships are important determinants of self-respect (Baumeister & Leary, 1995; Leary, Tambor, Terdal, & Downs, 1995). About 61% of students cite conflicts with roommate as a source of stress (above conflicts with parents or romantic partners; Ross, Niebling, & Heckert, 1999). Taking into consideration possible stress consequences mentioned earlier, this information looks alarming. This suggests the necessity of further research of roommate relationships within the framework of social psychology.

The problem of an inadequate roommate emerges in its very beginning - in the process of finding one. The roommate usually comes in the package with the room or apartment, at least in Croatia. The process goes like this: a student has his own flat or finds an apartment in ads, and he announces that he is looking for a roommate through standard channels of student communications. Potential roommates, based on the photos of the apartment, decide whether they are going

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to live with that person or not, while the question of (in) compatibility of persons is being put aside, until it's too late.

The vision of founders of the *idealni-cimer.hr* web interface was to reverse that process in order to improve students' wellbeing – to design a roommate compatibility questionnaire that will allow interface users to choose the most adequate roommate amongst numerous potential roommates on the list. Thus, the process of resolving the apartment issue of the students would now look like this: the first step would include finding an ideal roommate, second searching for an apartment together, and the third step moving into the apartment. Murstein (1970) differentiates between two kinds of situations in which close relationships begin: close field situations, where people are forced into interactions, and situation of the open field, where people freely choose whether they want to interact or not. The reversal of the process, that is, giving opportunities to students to select an appropriate roommate from a huge list of potential roommates, would transform the search for a roommate from the close field situation, that has been the case up till now, into an open field situation, where students would have a possibility to choose their roommates themselves.

Furthermore, there is an issue of ideal roommate definition. Are there some general characteristics that an ideal roommate should have, or are these characteristics individual and specific? That is, is one student's ideal roommate also going to be another student's ideal roommate? Is similarity the only important thing in roommate relationship, and what are, in fact, relevant roommate characteristics? What should the questionnaire focus on?

Since there was no previous research that covers this topic, we tried to find the answers to these questions by looking at the studies of friendship relationships. Hays (1984) found that friends are more similar to each other than people who are not friends, particularly with regards to age, gender, marital status, race, personality traits, and intelligence. It also seems that similarity in attitudes results in attraction (Buunk, 2003). Proximity, especially relevant for roommates, strengthens familiarity, which causes attraction. However, in order for friendship to be initiated, it is necessary to have overlapping interests, attitudes, values, origins, and personalities (Aronson, Wilson, & Akert, 2005).

In their study on intimate relationships, Boyden, Carroll, and Maier (1984) found significant importance of personality characteristics in homosexual partners. Their findings were replicated by other researchers on heterosexual couples, and, what is even more interesting, they found the same results on friends (i.e., Martin & Anderson, 1995). However, it seems that similarity in previously mentioned demographics characteristics has an influence independent from personality traits (Tenney, Turkheimer, & Oltmanns, 2009). Having in mind the abovementioned insights and in order to identify Croatian roommates' relationship quality determinants, we tried to develop a roommate compatibility questionnaire.

PILOT STUDY

Based on assumption that roommate relationships are culturally specific, and considering the lack of literature about this topic, we decided to conduct the pilot research in order to identify key constructs that influence roommate relationship satisfaction. As it has already been mentioned, previous research has suggested some general constructs, like attitudes and personality traits. However, our goal was to identify specific attitudes and personality traits that influence roommate satisfaction. Hence, we contacted 120 female and male students from different faculties at University of Zagreb, who came from various Croatian cities, and focus groups were formed.

Focus groups were conducted by the authors of this paper. Ten participants formed each group and each session lasted for approximately one hour. In a series of discussions, the students have shared with us their roommate experiences, both positive and negative ones. They were asked questions such as "What has bothered you most with your former/current roommate?", "What are important characteristics your roommate should have?", and "Can you remember some problematic situation with your roommate and tell us how you resolved it?". They were encouraged to elaborate and discuss every statement. The answers were logically analyzed and grouped into three categories of the determinants of roommate relationship satisfaction.

Hence, attitude objects (i.e., neatness, expenses, and agreements) and several personality traits, that is, consci-

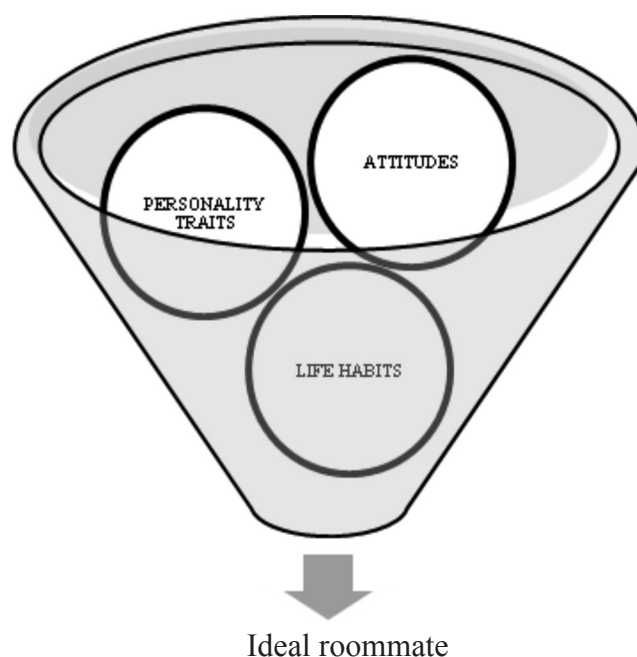


Figure 1. Key constructs supposed to influence roommate relationship quality.

entiousness, self-discipline, cooperation, extroversion, and neuroticism, were identified as most important to a good roommate relationship. Apart from attitudes and personality traits, life habits have also shown up as a third important determinant. While the participants were emphasizing similar attitudes and personal traits as desirable, it was more important for life habits to be compatible to roommate's expectancy, rather than similar to his life habits. This finding suits Winch's (1958) theory of complementary needs. These three key determinants served as a basis for constructing our roommate compatibility questionnaire and are shown in Figure 1.

QUESTIONNAIRE CONSTRUCTION AND VALIDATION

After focus groups had been carried out, life habits and attitudes were logically divided into subcategories, according to the most common problems and issues reported by participants. They included usual problems that could challenge roommate relationship such as neatness (e.g., cleaning up the bathroom and the bathtub after usage), expenses (e.g., sharing housing costs), agreements (e.g., cleaning schedule), etc. Those subcategories were created only to serve as general guidelines for item composition.

Accordingly, we composed the items ($k = 15$) some of which referred to both cognitive and affective aspects of attitudes. Student's task was to select how much he or she agreed with each statement (e.g., "It is disgusting to see the hairs in the bathroom."), on the bipolar scale from 1 to 5. By doing this, we have operationalized attitudes.

Apart from that, we have also composed items referring to usual behavior, where student could choose on the bipolar scale from 1 to 5 how much he or she agreed with the claim (i.e., "I regularly clean up the hairs in the bathroom after taking a shower."). In this way we have operationalized life habits. Considering the fact that life habits should fulfil the other roommate's expectations, items related to life habits have two equivalent forms - first refers to life habits of the person filling out the questionnaire ($k = 26$) and the other refers to expected life habits of his or her ideal roommate ($k = 26$).

Not all personality traits were equally important, according to focus groups. Hence, we chose personal traits and their facets that seemed of primary importance, and those were conscientiousness, self-discipline, cooperation, extroversion and neuroticism. The items for all the facets were taken from IPIP 300 (Goldberg et al., 2006). Total number of items in the questionnaire was 50 (10 for every facet), and while filling out the questionnaire student was supposed to select for each claim whether it was true or false for him. The questionnaire was developed for the practical usage at web interface idealni-cimer.hr, so we chose true-false rather than usual 1-5 response mode, in accordance to what the students reported to be easier for them during focus groups.

The idea behind the questionnaire development was to determine the degree of compatibility between the two potential roommates in the following manner: with regards to the attitudes and personal traits, for which is demonstrated that a good relationship requires similarity between the per-

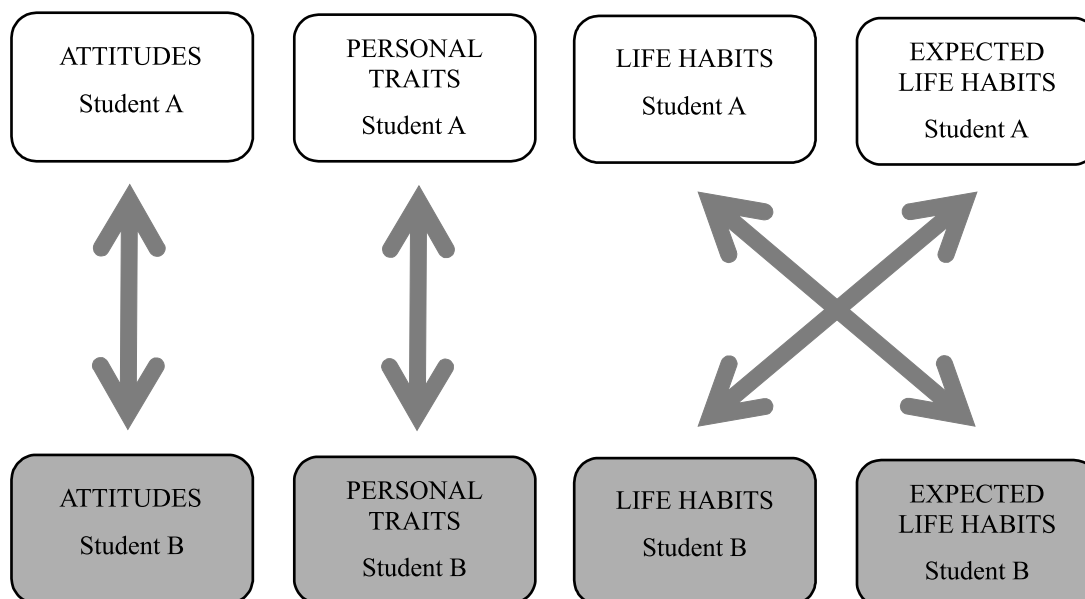


Figure 2. Schematic diagram of the roommates' compatibility calculation procedure.

sons, the percentage of compatibility between two roommates is to be determined. For example, on a scale from 1 to 5, 100% compatibility is present if both roommates have an equal responses (e.g., value 4 selected by both potential roommates), while any difference in the responses diminishes the compatibility percentage (for example, the situation when one roommate has chosen value 2 while the other one has value 4). With regards to the life habits, we determined percentage of compatibility amongst the expected life habits of one and self-estimated life habits of the other roommate, as shown by the diagram on the Figure 2. By calculating the average of the four percentages, we got the total compatibility percentage for the two potential roommates. The algorithm used by web interface idealni-cimer.hr to calculate the compatibility percentage was the following:

$$\text{compatibility percentage} = 100\% - \left(\frac{(100 - \frac{\sum|A_A - A_B|}{68})}{4} + \frac{(100 - \frac{\sum|P_A - P_B|}{45})}{4} + \frac{(100 - \frac{\sum|H1_A - H1_B|}{114})}{4} + \frac{(100 - \frac{\sum|H2_A - H2_B|}{114})}{4} \right)$$

where indices A_A and A_B demark responses selected by roommate A and B, respectively; A_i response on attitudes questionnaire; P_i number of selected "true" answers on personality scales; $H1$ results on life habits questionnaire Form 1 and $H2$ on life habits questionnaire Form 2; and denominators in the numerator indicate the maximum possible sum of differences in each part of the questionnaire.

After the questionnaire has finally been constructed, as well as the appropriate algorithm, we proceeded with validation of the questionnaire. This time it was done on another sample of students and their roommates. This new sample of 40 pairs of roommates estimated their roommate satisfaction first, and then they filled out the newly constructed questionnaire. The compatibility percentage obtained in the questionnaire was correlated with roommate satisfaction estimate, and the correlation coefficient was $r = .71$, $p < .01$, which indicated high diagnostic validity of the questionnaire. This has completed both the process of questionnaire construction and starting the idealni-cimer.hr internet interface, whose detailed description is given in the Appendix.

MAIN STUDY

The aim of the study was exploratory in nature. We tried to identify and elaborate the specific determinants underlying the quality of and satisfaction with roommate relationships of Croatian students, in order to better understand such relationships and provide some guidelines for further research.

Participants

The study utilized data from 312 users of idealni-cimer.hr web interface, of which there was 191 female and 121

male students. Most of them were from University of Zagreb, Croatia, and a negligible minority was from Universities of Split, Rijeka, and Osijek. Since users are not required to indicate their previous roommate experience when using the web interface, it was not possible to differentiate participants according to their previous experience with roommates.

Methods and instruments

Findings from the pilot study were used as a starting point for the research. The users of idealni-cimer.hr interface were notified, while they were using it, that their answers may be used for research purpose as well but that the data will never be analyzed individually.

A questionnaire consisted of three parts (attitudes, personality traits, and life habits). Since the item type in each part is not similar with the ones in other two parts, it was not possible to present all three categories the same way. Hence, each part was processed separately, that is, the whole questionnaire was considered a battery composed of four questionnaires: attitudes questionnaire, personality questionnaire, and two life habits questionnaires (which had two equivalent forms) The items of the personality traits questionnaire were taken from an existing validated questionnaire (see description above; Goldberg et al., 2006; Jerneić, Galić, Parmač, 2007), so additional validation procedures were not done on the present sample. Thus, we focused onto questionnaires of attitudes and life habits, whose items we created based on the finding revealed by focus groups. The time of filling out the questionnaire and IP address of the participants were registered in order to exclude the possibility of a single user filling out the questionnaires more than once.

Results

We used factor analysis in order to determine factor structure of the attitudes and life habits questionnaires. A complete schematic diagram of the factorial structure is shown in Table 1. To make sure that the questionnaires meet the psychometric requirements needed for using correlation matrix in factor analysis, we conducted Bartlett test and Kaiser-Meyer-Olkin test (Kolesarić & Petz, 2003). To estimate reliability, we calculated Cronbach alpha coefficient for both questionnaires. Normality of the distributions of scale scores was checked by Kolmogorov-Smirnov test (Kolesarić & Petz, 2003). Bartlett's test was statistically significant, $\chi^2(378, N = 312) = 3207.41$, $p < .01$, and value of Kaiser-Meyer-Olkin test was .774. Based on the results of these two tests we concluded that the correlation matrix is suitable for factorization.

Attitudes questionnaire (Neatness Scale). Factor analysis showed that all 15 items were explained by the same factor. And while eigenvalue of the second and third fac-

Table 1

The ideal roommate model - factorial structure underlying the quality of roommate relationship

Factor/dimension	<i>k</i>	Example
Neatness viewpoints	17	-
Personality traits	50	-
Conscientiousness	10	-
Self-discipline	10	-
Cooperation	10	-
Extraversion	10	-
Neuroticism	10	-
Life habits	26 ^a	-
Behavior concerning common living space	13	Neatness in the kitchen; Regularly doing laundry; Cleaning the hairs after bathroom usage; Respecting agreements; Not producing noise
Behavior concerning relationship to roommate	9	Empathy; Cleaning up after roommate, caring; Personal belongings sharing
Bringing over guests in the common living space	4	Boyfriend/girlfriend

^aFor each of the two forms.

to exceed the value of one, based on magnitudes of their values and scree test information, only the first extracted factor was retained. This factor explained 33.04% of total variance, and reliability of the questionnaire is $\alpha = .88$. The content of the items indicates that the whole attitudes questionnaire mostly refers to neatness. Hence, we will call this questionnaire hereafter the Neatness Scale.

Gender differences on the Neatness Scale were not found, $t(221) = -1.896$, $p > .05$, and Kolmogorov-Smirnov test demonstrated that the distribution of the results is not different from the normal distribution, $KSZ = 1.058$, $p > .05$.

Personality traits questionnaire. Gender differences in the personality traits were found only for the neuroticism scale, $t(310) = -3.330$, $p < .01$, where the women were shown to score higher. Distributions of all the facets, as expected, were asymmetric.

Life habits questionnaire. Factor analysis of this questionnaire showed that three extracted factors explain 42.66% of total variance (individual contributions are presented in

Table 2

The results of factor analysis of the life habits questionnaire: Eigenvalues and percent of variance explained by the retained factors

Factor	Eigenvalue	% of the variance explained
1	4.675	18.702
2	3.296	13.185
3	2.692	10.770

Table 2). Eigenvalues of all three components were substantially greater than 1. Although eigenvalues of few additional factors also exceeded the value of 1, their contribution in variance explanation proved to be negligible, and therefore, three-factor solution was retained and interpreted. Oblimin rotation was used in the analysis. Correlations between factors were $r_{F1, F2} = .022$, $r_{F1, F3} = .105$, and $r_{F2, F3} = -.83$.

Through inspection of the content of the items, it was possible to meaningfully define factors. They were interpreted as behavior concerning common living space (F1), behavior concerning relationship to roommate (F2), and bringing over guests in the common living space (F3). The same factorial structure was noted both in life habits Form 1 (my habits) and 2 (my ideal roommate's habits). Since we wanted to explore students' expectations of their roommate, rather than their own habits, the second form was used for this purpose. Based on item content we were able to identify smaller logically formed entities within each of three factors (Table 1).

Behavior concerning common living space consists of 13 items, with reliability of $\alpha = .80$. We have noticed gender differences within this factor, namely, female students were more demanding of their roommates with regards to keeping the common living space neat and clean, $t(310) = -2.72$, $p < .01$. Distributions of scores on this factor proved to be normal. Behavior concerning roommate consists of nine items, with reliability of $\alpha = .75$. Bringing over guests in the common living space has four particles and reliability of $\alpha = .91$. In the last two factors there were no gender differences, and result distributions were different from normal.

DISCUSSION

The goal of this research was to identify and elaborate the specific determinants underlying the quality and satisfaction of Croatian students' roommate relationships. As suggested by the data obtained in the focus groups performed within pilot study, the key determinants of roommate relationship satisfaction seem to be neatness, personality, and life habits. Results clearly show that one of the main determinants of roommate relationship satisfaction is neatness, whether on cognitive (as in Neatness Scale) or on behavioral level (as in life habits questionnaire). The results on Neatness Scale refuted the stereotype that men are more untidy than women, or we can at least assume they are equally bothered with the untidiness, since the gender differences have been noticed in behavioral life habits questionnaire. Reviewing that assumption would require further research, though, since the difference might have been due to different self-report criteria rather than to actual behavior, but that investigation goes beyond the scope of this study.

It should be pointed out that in the life habits questionnaire the factorial structure was investigated both in the self-estimation of life habits questionnaire, as well as in ex-

pected life habits of roommates questionnaire. In both cases we got the same factorial structure, which is not surprising since the questionnaires are equivalent. Perhaps an additional analysis of life habits questionnaire would allow us to use one questionnaire instead of two, since these results imply very high validity of the whole procedure, as well as, of the questionnaire(s).

Results on personality traits questionnaire confirmed that Croatian students fit the expected norms (Tonković, 2012). As it was also expected, female students score higher on the neuroticism scale than men (Larsen & Buss, 2005).

The Bringing over Guests in the Common Living Space factor should be more investigated and studied. The questionnaire used at idealni-cimer.hr web interface includes only the questions about the relationship with the romantic partner, while relationships with friends were investigated in the demographic questionnaire, and thus, asked in a different way, were not comparable to romantic relationships we use in the life habits questionnaire. We assume that additional particles on friends in common living space would increase the percentage of variance explained by the third factor.

As has already been mentioned earlier, in the field of social psychology we often come across cultural differences (Myers, 2005), so the question arises how much it is possible to generalize the suggested model onto any other population besides Croatian students. Hence, the plan of the researchers is to perform the cross validation of the proposed model on students from each of six major continents. First steps have already been taken with the purpose of contacting sufficient number of universities whose students would be willing to fill out our roommate compatibility questionnaire through Internet, but this time not with the purpose of actually finding a roommate, but rather with the purpose of acquiring new scientific insights. They will also have a possibility of giving suggestions for further development of the questionnaire (i.e., proposing the things which also, according to their opinion, play a significant role in roommate compatibility).

The data on diagnostic validity of the questionnaire has been acquired in this study. The users of idealni-cimer.hr interface will also receive a short request by electronic mail, 6 months after their coupling with a roommate, to submit short feedback information, namely, to designate on a scale from 1-100 how much they are indeed satisfied with their roommate. Thus we plan to correlate the percentage we got when using this questionnaire and the real percentage of satisfaction with the roommate and thus establish the prognostic value of the questionnaire.

According to Hale (2011), increasing the level of roommate satisfaction may motivate students to persist to the next semester. Pairing roommates with similar interests and hobbies could also be incorporated in the social factors category, one of Shen's (2003) five categories that impact

dropout, along with academic factors, academic preparation, academic performance, and commitment.

The results we got and the proposed structure imply that roommate relationships are very complex, i.e., it is difficult to put under the same roof all the constructs that determine its quality. Future research could consider dysfunctional roommate relationship as a trigger for an antisocial behavior. If a parent has a strong influence on an individual in his early age and a romantic partner later on (e.g., Etcheverry & Agnew, 2008; Freeberg & Payne, 1967; Haynie, Giordano, Manning, & Longmore, 2005; Middleton & Loughhead, 1993), how much of an influence does a roommate have? Due to its complexity and importance for an individual's wellbeing, roommate relationships offer a wide specter of research possibilities, and we believe that in the following years the area will engage the attention of social psychologists.

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APPENDIX

How does idealni-cimer.hr interface work?



Idealni-cimer.hr is an interface developed for the purpose of allowing a student to find a suitable roommate in half an hour, a person that is most similar to the profile of his or her ideal roommate. Interface has been developed after authors' realization that a huge number of roommate couples, who have found each other through ads, break up the roommate relationship in a few months period, and, because they often find themselves in a serious conflict, they often end their friendship. Idealni-cimer.hr interface is very easy to use, and the whole process consists of four steps:

1. *Registration.* The first step on the road to finding the ideal roommate is registration. It is possible to create an account using Facebook or to register by e-mail. The data necessary for registration is reduced to minimum, and it is possible to add more information while editing the profile.

2. *Editing the profile.* It is recommended to enter as much info as possible and to attach a photo to make it more authentic and reliable. Information that users post on the profile is accessible to users from the database.

3. *Filling out the questionnaire.* The questionnaire is divided into three parts: (a) filter questionnaire, (b) questionnaire regarding attitudes and personality traits, and (c) questionnaire regarding life habits of the individual and a roommate. The users are instructed through video clip to answer honestly and not to try misrepresenting themselves. As an example, it is mentioned that if someone is untidy, idealni-cimer.hr will pair him with someone tolerant, and hence there is no motive for misrepresentation.

The purpose of filter questionnaire is to eliminate as much of the candidates as possible from the database that

are not compatible with the user regarding some of his fundamental principles. Here we find questions and statements such as "Do you search for roommate with the purpose of living in the student dorms or private apartments?", "Do you prefer roommate of same gender?", "Would you mind if your roommate was of other nationality than you?", "Would you mind if your roommate was of other religion than you?", "Would you accept to live with the person of sexual orientation that differs from yours?", "Would you accept to live with the person who consumes tobacco products?", etc. After the notable number of candidates from the database has been filtered, mathematical algorithm couples the answers of the candidates with the answers from all the remaining users in the database according to the answers to the remaining questionnaires.

The attitudes and personal traits questionnaires are integrated into a single questionnaire on idealni-cimer.hr interface and both questionnaires are being filled out in the second part of the process. Based on the collected information from the answers we made a separate statistical analysis for the purpose of this study.

After the student has filled out the questionnaire, he or she is being compared to all the potential roommates in our database and the interface searches the database for the most compatible roommate. At the same time, user's profile enters into the database in order to be available for search to future users, until the user decides on the roommate.

4. *Finally the user is being shown a table with the list of his ideal roommates.* After filling out the questionnaire (it lasts about 30 minutes) the system calculates the degree

of compatibility with all other users that filled out the questionnaire prior to that moment. Next to the name of every potential roommate, there is a label *Contact*. By clicking it, you can see the profile of that person, and you can see all the information about that user entered in the previously described second step.

A thing that is of utmost importance is that this questionnaire is not an adaptation of some already existing psycho-

logical questionnaires, and it has no diagnostic function. No ones' "psychological profile" is neither available nor visible to anyone or anywhere. The numerical results are being paired with the existing results in the database according to previously developed algorithm, hence the only information the users finally get is the percentage of compatibility with existing roommates.