

Promoting co-responsible behavior between students with regard to the preparation and offering of fruit

Anne Hopstaken

TU Eindhoven

Eindhoven, the Netherlands
a.hopstaken@student.tue.nl

Levy Kösters

TU Eindhoven

Eindhoven, the Netherlands
l.kosters@student.tue.nl

Lisa Laugs

TU Eindhoven

Eindhoven, the Netherlands
l.f.m.laug@student.tue.nl

ABSTRACT

The amount of people over 18 that are overweight rapidly increases[9]. One of the main causes is the eating behavior of people[4]. Students that are living on their own have a specifically bad eating behavior[7].

The purpose of this study is to explore how to stimulate co-responsible behavior with three students that are living together to eventually improve their eating behavior regarding fruit consumption. A combination of quantitative and qualitative data is collected in the four weeks of the experiment. The data is a combination of interviews, questionnaires and the data stored by our design.

The design we used to stimulate co-responsible behavior is called the Responsibowl. This is a fruit bowl that shows the division of each student's fruit consumption. It should make the students more aware of each other's fruit consumption and eventually stimulate them to prepare or offer fruit to each other, which is co-responsible behavior.

The experiment lasted four weeks. Two weeks with a fruit bowl that would only light up when someone enters the kitchen (Responsibowl 1.0) and two weeks with a bowl that shows the fruit consumption division (Responsibowl 2.0).

The results of the experiment gives insights on new aspects that could influence co-responsibility. This creates opportunities for follow-up researches on for example different contexts (e.g. family households) and new designs.

Author Keywords

co-responsibility; students' eating behavior; fruit consumption; social design

INTRODUCTION

In 2016, 49.2 percent of all Dutch people over 18 were overweight. This number has been rapidly increasing the last 25 years and it is likely that it will continue to rise in the future [9].

In this study, we want to focus on changing the eating behavior of students, because nutrition has a large impact on a person's health, more than exercise and genetics [4]. Students have a specifically bad eating behavior [6], which is why we wanted to focus on this target group. We chose students living away from home as our target group because

they have to completely determine their own food intake for the first time in their lives. We believe that there is much room for improvement in this target group, because the students' behavior is relatively new and can therefore be changed easily.

Multiple factors influence the eating behavior of students [6]. These influences often come from a combination of physical and social factors. The accessibility, availability, price and taste are examples of physical factors. Social factors include the habits and traditions students have developed and learned from their parents during childhood[7]. Besides this also the eating behaviors of peers and certain trends are of influence on the fruit consumption of students. In this research we will combine the previously mentioned factors.

No research has yet been done in the area of co-responsible behavior between students. The term co-responsibility will be explained in the related work section. Our aim is to verify whether a product (the Responsibowl) that impacts both the availability and accessibility factor and the social influence of peers, can promote co-responsible behavior between students living in a student house. The research question we want to answer in this study is: Can the Responsibowl promote co-responsible behavior between students living in a student house with regard to the preparation and offering of fruit?

This paper presents a mixed method comparative study, exploring the influence of our design on the felt and acted responsibility among students (that are living in the same residence) to prepare and offer fruit to each other. A beneficial consequence of this co-responsibility could ultimately help students increase their daily fruit consumption. However, the increase of fruit consumption is not a primary goal, since this study is mostly focused on creating co-responsibility between the students.

RELATED WORK

Co-responsibility

Co-responsibility entails the idea that responsibility is not something that only belongs to a single individual. Instead the individual's responsibility is influenced by the responsibilities of other people's individual responsibilities.

This means that the responsibilities of those other people are not the same as the individual's responsibility but still are interdependent [2, 5]. The concept of co-responsibility can best be explained by an example:

In a household, a teenage boy with obesity wants to eat healthier. This responsibility to eat healthy could then be influenced by the responsibility of his family members. For example: his father buys groceries and his mother cooks dinner. Their choices to buy and prepare certain foods will influence the boy's success with regard to eating healthier. The boy's family members may have different obligations (work, clubs, social relationships) which could lead to the family not having enough time to prepare a healthy evening meal. This could then negatively affect the boy's responsibility to eat healthier.

Furthermore it is worth noting that there is a distinction between 'feeling responsible' and 'being held responsible'. While 'feeling responsible' is associated with intrinsic motivation, 'being held responsible' is mostly about external factors that motivate the individual (external motivation). During this study we want to focus on using our design to stimulate an intrinsic motivation, because we want students to voluntarily feel responsible. [5].

Periphery and center of attention

As mentioned earlier, we want to promote co-responsible behavior by using availability and accessibility factors (as well as the social influence of peers). We sought to increase these factors by increasing the visibility of the fruit, mainly by attracting attention to the place where the fruit is located.

When interacting with a product or doing an everyday task, one's attention may be in the center of attention (focused) or periphery of attention (subconsciously performing an activity that doesn't require your full attention) [1]. The attention can shift between the center and periphery and there are two principles for this. The first one is called salience and uses extraordinary stimuli (loud sounds, sudden movements) to draw your attention to the center of attention. The other principle is called priming, and relates more to the things that are back in one's mind or intrinsic stimuli, such as your own name.

For our design, we used light, which is part of the salience principle, to attract the subjects' attention. This will work for all people and is not linked to one specific person. Also, sound or sudden movements, which are also part of salience, would cause too much disturbance and are therefore not suitable for the context of our study. Light was therefore the most convenient option.

Influences on fruit consumption

Several studies have investigated the eating behavior of students. It was found that college students have a poor eating pattern, eating too many high-calorie and high-fat products and too few portions of fruit. Only 7.3 percent of

the students ate more than two portions of fruit per day, according to the American College Health Association [7].

Research has already been done on the consumption of fruit among students and children. In these papers the factors that could possibly influence the consumption of fruit and vegetables of students and children are described [6,7]. The overall results of these papers show that there are multiple aspects that could influence the fruit and vegetable consumption. With children besides taste, also social influences are decisive factors on the fruit and vegetable consumption [6]. The social influences contain both the modeling of the child by the parents, peers and teachers and the fruit and vegetable consumption of the parents, peers and teachers [7]. Looking at students the learned behavior towards fruit and vegetable consumption in their childhood plays a big role in their current food and vegetable consumption [7]. Next to this, the previously named social influences are important. Yet a difference is that the social influence of the peers has become more important than the parents' influence [6]. Another important factor that plays a role in the fruit and vegetable consumption in both the student and childhood life is the availability and accessibility. Research showed that when portions of fruit or vegetables are available and easily accessible, people are more likely to eat those portions [6].

RELATED PRODUCTS

We want to induce co-responsible behavior amongst students living in a student house. Ideally, we would want to stimulate all residents to take part equally in consuming fruit. In order to do this successfully, we looked at products designed for a similar goal.

Products targeting co-responsibility

Zhòng Zhòng is a device targeted at teaching Chinese children how to share. Many Chinese children don't have siblings because of the one-child policy, causing them not to experience sharing at home. To teach them this skill, a toy was created to promote sharing amongst children in kindergarten. Each child gets a tube which lights up in a certain color. By connecting their tubes, children can create new colors. This costs them some light intensity, but not sharing colors causes their lights to slowly turn off. This way, children can see how much others have participated and shared with others.

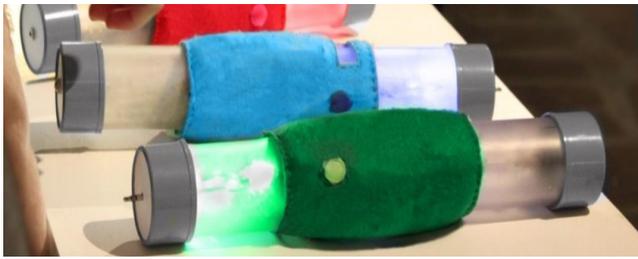


Figure 1: Zhòng Zhòng was designed by TU Eindhoven students Philémonne Jaasma, Zheliuyi Wang, Samantha Peeters, Jacquelyn van Kampen and Matthijs van Leeuwe

Designed for the context of gym class in high school, the Wearable team coach is a set of shirts visualizing children’s participation during sports. On each shirt, there is a set number of strips that can light up. The more the child has possession of the ball, the more stripes light up. This way, it is visible to other children who did not get to play much yet. This was meant to motivate children to create even numbers of ball possession percentage across a team.



Figure 2: Wearable team coach is a design by Sander Bogers

These products contain a similar element, being that they visualize the level of participation of each co-responsible member. This was found to motivate the individuals involved to interact with each other and to make sure they helped everyone contribute equally [5]. We use this same concept for Responsibowl, the design artefact which we use in our study.

METHODOLOGY

Study design

To investigate whether it is possible to create co-responsible behavior between students, we designed a study in which two situations will be compared to each other. In situation A, the first prototype, *Responsibowl 1.0*, is placed in a student house. It will be placed in the kitchen and only has one function: drawing the attention of the students. This is done by lighting up a LED strip when a person enters the kitchen.

For situation B, the second prototype, *Responsibowl 2.0*, is placed in the same student house. This prototype has more functions. Instead of only lighting up when a participant enters the kitchen, the LED strip now shows a division of the fruit consumption of the different students. This division

provides a quick and clear overview, allowing the subject to easily see who ate what amount of fruit. The subjects must indicate manually by means of buttons who will eat fruit every time they take something from the bowl. From this information, the division is updated.

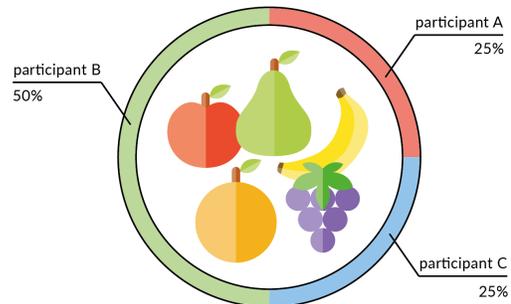


Figure 3: Schematic visualization of the fruit division as shown on Responsibowl 2.0. In this example participant A and C both ate 25% of the total amount of fruit, and participant B ate half of the total amount of fruit.

During both situations, the students are asked to keep track of how many portions and what kind of fruit are consumed every week. Next to that, weekly interviews are held to figure out if the fruit bowl or other external factors have an influence on the participants’ behavior regarding their fruit consumption. To make sure the participants displayed natural behavior and did not feel forced to do anything because of the experiment, we asked them to fill in a questionnaire with questions from the intrinsic motivation theory [8]. We took the elements of the theory that were relevant to our research and changed them slightly to fit our research purpose. At the end of week 4, the final interview and questionnaire are conducted, regarding the offering and preparing of fruit to the other participants. From this interview and questionnaire it will become clear whether Responsibowl 2.0 caused a change in behavior compared to the first two weeks.

The same subjects will be used for both situations, to eliminate the amount of variables that could influence the study. The study will take 4 weeks in total, 2 weeks for situation A and 2 weeks for situation B.

Additional information on study design

During the study we will fill the Responsibowls with fruit on a weekly basis. This is to prevent the study from being influenced by the lack of availability and accessibility of fruit in the student house. Furthermore, we want our primary goal (creating co-responsibility) to be concealed. The reason for this is to make sure the participants are not biased, so their behavior is more authentic. Therefore, the participants believe that our study is only about increasing the fruit consumption of students.

In order to rule out the variable of taste we asked the participants to suggest which fruit they prefer. By filling the fruit bowl with the participants' preferred fruit we can rule out that a low fruit consumption might be caused by participants that do not like the taste of the provided fruit.

Materials

Responsibowl 1.0 is a fruit bowl with a LED strip integrated on the side of the bowl, containing 52 individually controllable LEDs. By means of a movement sensor, Responsibowl 1.0 can detect when a person enters the room. When movement is detected, the LED strip will turn on.



Figure 4: On the left, you can see Responsibowl 1.0 in its neutral state. When it detects movement, the bowl will look as it does on the right.

Responsibowl 2.0 is the same fruit bowl with LED strip, but it has some additional sensors and actuators. The base of the fruit bowl contains three switches aligned with three LEDs above them. Each LED has a different color (red, blue and green) which represent the different students living in the house. The switches can be turned on or off, and the LEDs provide visual feedback of this state. Next to the switches is a button, which serves as a 'confirm' button and uploads the new division to the LED strip. The LED strip shows the division with the corresponding color (red, green and blue).

Due to technical feasibility, Responsibowl 2.0 does not contain a movement sensor. However, we do not expect its function of drawing attention to be compromised by this. The Responsibowl 2.0 will most likely still be noticed when a person enters the kitchen, because its light will always be on.

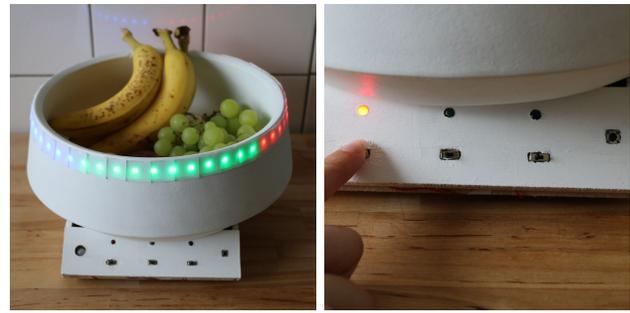


Figure 5: In Situation B, Responsibowl 2.0 shows the fruit consumption division of the participants (left). The photograph on the right shows the base construction with switches which allow students to update the division.

Participants

For our research, we looked for a student house with more than two people living there. We recruited 3 female participants that live in the same house and have a friendly connection with their house mates, meaning that they do not isolate themselves in their respective rooms and generally feel positively towards each other. We verified whether our participants fit in that group by means of the Questionnaire Close Relatedness, which can be found in Appendix A.

The participants are all full-time students in the age group of 16-25 years old. The student house is situated in the city of Eindhoven. All participants are enrolled at the TU Eindhoven and are therefore familiar with the TU/e Code of Conduct. Therefore, they did not need to sign an Informed Consent form.

Hypotheses

There are two variables to consider from the experiment. Firstly, there is the amount of fruit that the residents make for themselves and secondly, there is the amount of fruit the participants make for/offer to another resident. Depending on how these two variables evolve over the duration of the experiment, we can draw different conclusions on the co-responsibility inducing effect of Responsibowl 2.0.

Most importantly, we hope that in situation B, the participants will make more fruit for other residents than in situation A. In these cases, it can be concluded that seeing the fruit division does indeed promote co-responsible behavior between the residents of the student house. In order to make sure all residents had a relatively equal fruit consumption, participants would then prepare fruit for others.

In terms of the amount of fruit they take for themselves, this can either decrease, stay the same, or increase. In case of a decrease, the participants would have eaten less themselves and prepared fruit for others (with a lower fruit consumption) to balance out the division, resulting in an equal amount of fruit consumed in both situations. In case of an increase, a similar effect may have taken place. Then,

instead of the ‘leaders’ in terms of fruit consumption restraining themselves, the students with the lowest fruit consumption try to catch up with the residents with a higher consumption. In comparison with the decrease, this would be better in terms of health (every resident eats more fruit), but not necessarily better in terms of co-responsibility, because the ones with the lowest fruit consumption have to make more of an effort to keep up with the rest. The third case, in which the residents make the same amount of fruit for themselves, may be the most favorable in terms of health and co-responsibility, because no resident restricts their own fruit consumption or has to put in extra effort to keep up with the rest.

Of course, it is also possible that the participants do not start making fruit for each other. In that case, the fruit division may have had a different effect on them than we had intended. Even if they do not make fruit for each other, it is still possible that they made less, the same amount of, or more fruit for themselves. Depending on this, we can try to explain the effect of the fruit division on them.

If there was a decrease in individual fruit consumption, this could mean that the fruit division did not have any extra effect on them. Similarly to the first two weeks, the only thing the participants would pay attention to is the lighting up of the bowl. After a few weeks, they would have probably gotten used to that happening and the lights may have not been successful in drawing their attention anymore. Another reason to explain the decrease is that participants may have been slowed down by seeing the fruit consumptions, because they saw they already occupied a large portion on the LED strip and wanted to leave some fruit for the other residents. This behavior may also be co-responsible, although of passive instead of active nature. In case the fruit consumption stayed stable compared to the first weeks, this also probably means that the fruit division did not have any significant effect on the participants. In this case, the participants would have simply continued their behavior from the first two weeks: having their attention drawn by the Responsibowl and taking some fruit to eat. Differently to the last scenario, the effect of the light as a means to draw participants’ attention would not wear of with time. In the case of an increase of individual fruit consumption, the introduction of Responsibowl 2.0 did have a good effect in terms of health, as it promoted the residents to eat more fruit, but not in terms of co-responsibility. One explanation for the increase could be that the participants became competitive surrounding their fruit consumptions and wanted to occupy the largest part on the LED strip, which is far from co-responsible behavior. Another explanation might be that residents became more aware of their own fruit consumption and that this created an extra stimuli for them to take fruit when passing the Responsibowl 2.0. In this case, every participant looks after

their own fruit consumption, which is also not considered co-responsible behavior.

RESULTS

Preliminary interview

Before the start of this experiment, an interview was held to determine the participants’ behavior regarding fruit consumption outside of the experiment. When asked about reaching the recommended fruit intake, it became clear that none of the participants reached this recommendation of two portions a day. According to participant A, this is because she often forgets to buy fruit when doing groceries. Participant C admitted to rarely eat fruit while the others tried to eat one portion a day. Also, usually, the participants do not have a fruit bowl anywhere in their house and put fruit on the kitchen counter when they buy some. Furthermore, we discovered that the participants only occasionally share pieces of fruit. From this we conclude that, before this experiment, the level of co-responsibility regarding fruit consumption is not high.

Situation A

Fruit consumption

Day of Week	Apple	Kiwi	Banana
Monday			
Tuesday			
Wednesday			
Thursday			
Friday			
Saturday			
Sunday			

Table 1: Fruit consumption during week 1

Day of Week	Apple	Kiwi	Banana
Monday			
Tuesday			
Wednesday			
Thursday			
Friday			
Saturday			
Sunday			

Table 2: Fruit consumption during week 2

During weekends, participants A and B usually go home to visit their parents and are therefore not present in the student house. This is also sometimes the case for participant C. In the first week of situation A. Ascension Day took place on Thursday and therefore, the subjects had

a long weekend from Thursday to Sunday. During that time, the students were also not staying in the student house.

The participants indicated that they all ate more fruit than usual, because they usually do not have much fruit available in their student house. We discovered that they were not very aware of the fruit consumption of the other residents, other than that they noticed there was less fruit in the bowl. When asked whether the participants noticed the fruit bowl and discussed it with each other, they said that the bowl was quite noticeable, especially at night, which they discussed with each other. However, the effect became less noticeable after a few days, because the participants got used to it.

Co-responsible behavior

From the interviews, we noticed that the participants did not display much co-responsible behavior. The only thing we found was that the participants, when getting fruit for themselves, would sometimes ask the other residents whether they would like a piece of fruit as well. In these cases, the fruit would not be peeled or cut, just brought to the other residents.

It did not seem as if participants ever prepare fruit for the other residents for when they come home. We also did not find any indication that the participants prepare fruit for other residents without asking whether they would like something first.

Before the start of the experiment, participants A and B indicated that they regularly discuss healthy eating with each other. However, as mentioned before, they were not very much aware of each other’s fruit consumption during the first two weeks of the experiment.

Situation B

Fruit consumption

Day of Week	Apple	Kiwi	Pear
Monday			
Tuesday			
Wednesday			
Thursday			
Friday			
Saturday			
Sunday			

Table 3: Fruit consumption during week 3

Day of Week	Apple	Kiwi	Banana
Monday			
Tuesday			
Wednesday			
Thursday			
Friday			
Saturday			
Sunday			

Table 4: Fruit consumption during week 4

We extracted data from Responsibowl 2.0, namely who ate fruit each time someone took something from the bowl, which is what the participants had to indicate manually with the buttons. From this data we found that no participants ever took fruit for multiple people at a time, as every time, only one person was indicated to eat fruit. Also, from the interviews, we found that no participant prepared fruit for others or got fruit offered by others. From the interviews, we found that this was because of two reasons.

Firstly, because the participants were often not home at the same time and therefore did not get the opportunity to offer fruit to each other. Participant A, who admitted in earlier interviews that she usually does ask if others want fruit, said in the final interview, when asked if she ever offered fruit to others: “No, I was always home alone when taking fruit.” In the second half of the experiment, all students were busier with school work and were at university more often. Participant A said in the final interview, when asked if she ever prepared fruit for others: “No, but that is because I am too busy. I already have to take time to make [fruit] for myself.”

The second reason is because they did not feel like it was their place to tell others to eat more fruit. Participant A, who occupied the largest piece on the LED strip at the time, said: “No, it is their own choice whether or not they eat fruit. I will not push them.” From this we can conclude that, as was discussed before in the hypothesis, no co-responsible behavior occurred upon the introduction of Responsibowl 2.0.

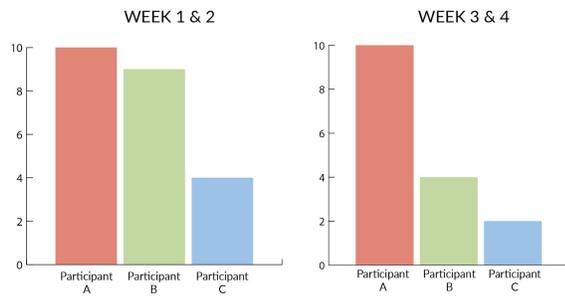


Figure 6: Bar chart showing the individual fruit consumption per participant for week 1&2 and for week 3&4

Looking at individual overall fruit consumption, it can be clearly seen that no participant ate more fruit in the second half of the experiment. Participant A ate the same amount of fruit, while participant B and C respectively halved their individual fruit consumption. For participant C, this can be explained because she usually does not eat fruit, but was motivated to eat more than usual in the first two weeks because of the introduction of a fruit bowl. In the second half of the experiment, she admitted to having eaten some fruit as well, because, as she said in the last interview: “I know it is really bad that I do not eat [fruit] and that I am not part of the ring. [...] I actually only ate fruit because I wanted to be on the strip.” Both the four pieces in the first two weeks and the two pieces in the second two weeks were peaks compared to her fruit consumption outside the study, but it can be concluded that the introduction of the fruit division did not do better at motivating her to eat fruit or motivating others to start helping her eat more fruit.

Responsibowl 2.0 did create awareness among the participants about the others’ fruit consumption. Participant C said that she noticed “that [the others] are more concerned about food than I am, especially about fruit.” Participant A said: “You can see [each other’s fruit consumption] more. First, everyone just took fruit and put it somewhere. Now it is all in one bowl.” This relates to the fruit being all together in one place, the Responsibowl (1.0 or 2.0), instead of lying somewhere in the kitchen, as was the case before the experiment.

There was no indication of the competitive aspect we also thought might occur with the introduction of Responsibowl 2.0. Participant C, who scored lowest in terms of fruit consumption, said in the last interview: “If it were some other thing, I would have [been competitive], but eating fruit is not really my thing.” Participant A, who was the leader all throughout the second two weeks, said, when asked if she ate more fruit to make sure her color was represented most: “No, I was already on most of the strip.” She described that she just did whatever she wanted in

terms of fruit consumption and did not think much about or paid much attention to the division.

DISCUSSION

Implications

Although the results have not shown a big increase in the co-responsible behavior of the students, it did show us new factors that influences co-responsible behavior and could be used in further research on this topic.

First we noticed that participants were aware of each other’s fruit consumption when using the Responsibowl. However, they were not inclined to help the participant who ate the least amount of fruit. The main reason for this was, according to the interviews, that the participants did not feel like the right person to talk about their eating behavior with the other participant. This could mean that even though the participants have a close relation with each other, they still do not feel comfortable giving each other educative advice without being asked for by that specific person. Out of this result we assume that the Responsibowl 2.0 would have a greater effect in family households, in which there is more of a nurturing than a friend-like relationship between residents. Next to that, co-responsible behavior could be promoted in situations where one resident has a clear goal and makes the other residents aware of that. This might create the openness that enables the other residents to talk and help each other in eating enough portions of fruit.

Secondly, the time the participants spent together during the two final weeks was a lot lower than the previous two weeks. This did not only affect the total fruit consumption, but also the co-responsible behavior. For the simple fact that it is not possible to offer fruit to the other participants when they are not home. Therefore it would be interesting to look into portable designs regarding co-responsibility. This could be in the form of an application or a wearable in which students could send reminders towards each other. The frequent absence of the participants also strengthens our assumption that the Responsibowl 2.0 would be more effective in a family household, since families are more likely to spend time together than students.

Limitations

There are several limitations to our research which could be improved for the future. First of all, we used convenience sampling for the collection of our subjects. Although we set up our study as professionally as possible and tried to conceal the aim of our research, the participants may have been biased because they knew us in person.

Also, the results would have been more extensive if we executed the experiment in more than one student house. This would have resulted in a more diverse groups of

people (e.g. people who eat lots of fruit, or people who are more/less likely to prepare fruit for others). This diversity would have created more value to our research in the sense that this research would be of a more representative matter. Furthermore the diversity would have given us the opportunity to discover possible patterns in behavior. However, due to the fact of rising costs and restricted time this was not an option for us.

Next to this, we could improve our research by doing the experiment for a longer period of time. Especially since the subjects were not there during the weekend and celebration days, the study was shorter than expected. Testing for a longer period, for example 6 weeks in total, could provide valuable extra data points.

Regarding the functionality of the prototypes (Responsibowl 1.0 and Responsibowl 2.0), there are a few limitations. In Responsibowl 2, a movement sensor was supposed to be integrated in the fruit bowl. In this way, there is consistency between the two prototypes, which means the movement sensor is not a variable that could influence our result. Due to technical difficulties however, the movement sensor in Responsibowl 2 didn't work and the light was on all the time. Although we don't think a large bias is caused by this, it is an improvement that should be looked into for the future.

Another improvement for the prototypes could be integrating the measurement of fruit consumption into the bowls themselves. When the amount of fruit that is taken, is measured automatically, there is no room for deviations and you will know the results are correct. Letting the subjects write down their own fruit consumption may lead to bias and/or human errors.

CONCLUSION

In this study our research question was: Can the Responsibowl promote co-responsible behavior between students living in a student house with regard to the preparation and offering of fruit? Looking at the results, the answer to this question is no. There are several reasons for this. Firstly, the participants were often not home together at the same time and were therefore unable to ask each other if they wanted some fruit. Especially during week 3 and 4 all participants spent a lot of time on their studies and rarely saw each other, which is a possible explanation for the decrease of the total fruit consumption in week 3 and 4. Secondly, the participants felt like it was everyone's own responsibility to eat enough fruit. They did not want to interfere or remind each other to eat fruit. From this we may conclude that there was no feeling of co-responsibility among the students.

The only form of co-responsible behavior that we detected was when participants were getting fruit for themselves, they would also ask their roommates if they wanted a piece of fruit as well. This occurred only rarely and was not caused by the Responsibowl(s).

A more valid result could be obtained if the study would be executed in a different setting/context. As mentioned in the discussion, family households might be very suitable test subjects, as they probably see each other more often and have a larger feeling of co-responsibility for each other.

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APPENDICES

APPENDIX A

Questionnaire Close Relatedness week 0

1. I feel really distant to the other residents *

Markeer slechts één ovaal.

	1	2	3	4	5	6	7	
not true at all	<input type="radio"/>	very true						

2. I feel like I could really trust the other residents *

Markeer slechts één ovaal.

	1	2	3	4	5	6	7	
not true at all	<input type="radio"/>	very true						

3. I'd like a chance to interact with the other residents more often

Markeer slechts één ovaal.

	1	2	3	4	5	6	7	
not true at all	<input type="radio"/>	very true						

4. I really doubt that the other residents and I would ever be friends

Markeer slechts één ovaal.

	1	2	3	4	5	6	7	
not true at all	<input type="radio"/>	very true						

5. I feel close to the other residents

Markeer slechts één ovaal.

	1	2	3	4	5	6	7	
not true at all	<input type="radio"/>	very true						

APPENDIX B

Questionnaire Intrinsic Motivation week 2

1. I believe I had some choice about taking fruit

Markeer slechts één ovaal.

	1	2	3	4	5	6	7	
not true at all	<input type="radio"/>	very true						

2. I felt like I had to take fruit

Markeer slechts één ovaal.

	1	2	3	4	5	6	7	
not true at all	<input type="radio"/>	very true						

3. I took fruit because I wanted to

Markeer slechts één ovaal.

	1	2	3	4	5	6	7	
not true at all	<input type="radio"/>	very true						

4. I believe this activity (taking fruit) has some value to me

Markeer slechts één ovaal.

	1	2	3	4	5	6	7	
not true at all	<input type="radio"/>	very true						

5. I believe taking fruit could be beneficial to me

Markeer slechts één ovaal.

	1	2	3	4	5	6	7	
not true at all	<input type="radio"/>	very true						

6. I think taking fruit is an important activity

Markeer slechts één ovaal.

	1	2	3	4	5	6	7	
not true at all	<input type="radio"/>	very true						

7. I would be willing to take fruit again because it has some value to me

Markeer slechts één ovaal.

	1	2	3	4	5	6	7	
not true at all	<input type="radio"/>	very true						

APPENDIX C

Questionnaire Intrinsic Motivation week 4

Questionnaire end of experiment

Please fill in this this questionnaire about offering fruit to and preparing fruit for other residents of the student house. It will take about 2 minutes to complete. Thank you!

1. How often did you prepare fruit for another resident/other residents?

Markeer slechts één ovaal.

- 0 times
- 1 time
- 2-3 times
- 4-5 times
- 6-7 times
- more than 7 times

2. How often did you offer fruit to another resident/other residents?

Markeer slechts één ovaal.

- 0 times
- 1 time
- 2-3 times
- 4-5 times
- 6-7 times
- more than 7 times

3. How often did you get fruit offered by another resident?

Markeer slechts één ovaal.

- 0 times
- 1 time
- 2-3 times
- 4-5 times
- 6-7 times
- more than 7 times

Describing the experience and motivation of preparing fruit for/offering fruit to another residents

Please rate the following statements on a scale of 1 to 7. If the statement is not applicable (because you did not offer fruit to or prepared fruit for other residents), you can just skip the question.

4. I felt very relaxed while preparing fruit for another resident

Markeer slechts één ovaal.

1 2 3 4 5 6 7
not at all true very true

5. I felt very relaxed while offering fruit to another resident

Markeer slechts één ovaal.

1 2 3 4 5 6 7
not at all true very true

6. I felt pressured while preparing fruit for another resident

Markeer slechts één ovaal.

1 2 3 4 5 6 7
not at all true very true

7. I felt pressured while offering fruit to another resident

Markeer slechts één ovaal.

1 2 3 4 5 6 7
not at all true very true

8. It felt like it was not my own choice to prepare fruit for another resident

Markeer slechts één ovaal.

1 2 3 4 5 6 7
not at all true very true

9. It felt like it was not my own choice to offer fruit to another resident

Markeer slechts één ovaal.

1 2 3 4 5 6 7
not at all true very true

10. I did prepare fruit for another resident because I wanted to

Markeer slechts één ovaal.

1 2 3 4 5 6 7
not at all true very true

11. I did offer fruit to another resident because I wanted to

Markeer slechts één ovaal.

1 2 3 4 5 6 7
not at all true very true

12. I think that preparing fruit for another resident is useful for this resident

Markeer slechts één ovaal.

1 2 3 4 5 6 7
not at all true very true

13. I think that offering fruit to another resident is useful for this resident

Markeer slechts één ovaal.

1 2 3 4 5 6 7
not at all true very true

14. I would be willing to prepare fruit for another resident again because it has some value to me

Markeer slechts één ovaal.

1 2 3 4 5 6 7
not at all true very true

15. I would be willing to offer fruit to another resident again because it has some value to me

Markeer slechts één ovaal.

1 2 3 4 5 6 7
not at all true very true

16. I believe that preparing fruit for another resident could be beneficial to me

Markeer slechts één ovaal.

1 2 3 4 5 6 7
not at all true very true

17. I believe that offering fruit to another resident could be beneficial to me

Markeer slechts één ovaal.

1 2 3 4 5 6 7
not at all true very true

APPENDIX D

* These questions are used to conceal the actual purpose of our study

** These questions are not directly related to co-responsibility, but are useful and complement our study

Interview week 0, 2

1. Do you ever reach the recommended daily amount of fruit (2 pieces a day)?**
2. If no, why do you think that is? (no fruit available, no appetite for fruit, just because you forget)**
3. How often do you usually eat fruit?***
4. On what times on the day do you eat fruit? And during what activities (studying, watching tv, socializing with friends)?*
5. (In case of social situation with friends) Do you all eat fruit then, or do you only make it for yourself?
6. Where is your fruit bowl located? Do you often pass this place in the house?***
7. Is eating healthy ever discussed in your student house? Do you make an effort to make sure you eat healthy?***

APPENDIX E

Interview week 1 and 3

1. How much fruit did you eat this week?***
2. Is this different from your normal fruit consumption? (outside the study)**
3. At what moment during the day is your fruit consumption the highest?*
4. Is your fruit consumption per day stable or is it dependant on the type of day? (e.g. a monday or saturday)*
5. Were there any irregularities we should be aware of? (celebration day, weekend)**
6. How many parts of fruit do you eat at a time on average? Was this portion always for yourself or did you sometimes share with your roommates/prepare fruit for them?
7. Are you satisfied with your current fruit consumption? Why/why not?***
8. Are you aware of the fruit consumption of others?
9. Did you talk to your roommates about the fruit bowl? What did they/you notice?***

APPENDIX F

Interview week 4

About weeks 3-4

1. Did using the fruit bowl make you more aware of each other's fruit consumption?
2. What influence did seeing the division of fruit consumption have on your fruit consumption?
3. Did you feel a certain tension when you noticed that you ate the least fruit of everyone?
4. Did you ever prepare fruit for others to find? And why? Did you ever offer fruit to others?
5. Did you ever find prepared fruit in the kitchen that was free for you to take? Did you ever get fruit offered by someone else?
6. Did this happen more than usually (before the research) or than in the first two weeks?
7. Did you ever consider making fruit for someone because you saw they didn't eat much fruit compared to others?
8. Did you feel responsible for the fruit consumption of others? Did you verbally motivate them to take more fruit?
9. Did seeing the fruit consumption of others motivate you to eat more fruit yourself in order to

make sure your color was represented most?
(competitive aspect)

10. Do you think that you have got closer since you were using the fruit bowl(e.g. talk more while offering fruit)?
11. Do you feel aware of other people's health and fruit consumption since the interference of the fruit bowl?
12. Do you have any special remarks about the time with the fruit bowl?

About weeks 1-2

1. Did you ever involve others when your attention was drawn to the fruit bowl? (For example, when sitting with the others in the living room, going to the kitchen for a snack, seeing the bowl and inviting the others to take some fruit too)
2. Did you ever prepare fruit for others when your attention was drawn to the fruit bowl?
3. Did you ever offer fruit to others when your attention was drawn to the fruit bowl?
4. Were you aware of how much fruit others ate before the division was shown?
5. Did you feel like everyone ate equal amount of fruit during the first two weeks?
6. If no, did you ever feel like you needed to address this with them? Or: did you feel like you all 'had to eat' a third of the fruit provided so it would be fair, did you refrain from taking more fruit because you knew they hadn't had as much?