

**UNIVERSITY OF TWENTE, ENSCHEDE**

**Effects of Gamification on an Online Positive  
Psychology Intervention**

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The Influence of Gamification Elements on the Enjoyment of Men and Women  
Doing an Online Positive Psychology Intervention

Bachelor thesis

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**Abstract**

The implementation of positive psychology in interventions shows a great effect on well-being. But the online forms suffer from a big drop-out rate. It is expected that this could be reduced by enhancing the enjoyment of the user with the application of gamification. However, literature shows that in some cases gamification does not work equally well for males and females. In this research it will be tested with an experimental design if an online psychology intervention is perceived as more fun when gamification is applied and if the effect of it is dependent on the gender. Therefore, 75 participants were divided randomly into two groups. The experimental group had a positive psychology intervention with, the control group the same intervention without gamification elements. After absolving exercises of the intervention, the participants had to fill in a questionnaire containing the sub scale of the Intrinsic Motivation Inventory (IMI) about enjoyment/interest. It became apparent that in this case gamification nearly has a significant positive effect on the participant's enjoyment. Furthermore, it seems that there neither was a gender difference nor was gender found to be a moderator for the effect of gamification on the enjoyment. Women seem to write significantly more words in the exercises. Overall it can be said that just the application of gamification does not assure that the user feels more enjoyment. A possible solution is to get the most out of the possibilities gamification has to offer.

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## 1 Introduction

Health, including psychological health, is not just the absence of pathologies, but also satisfaction in life and a good well-being. Well-being is an essential aspect of the quality of life and therefore a key factor of health. In the context of mental health well-being can be defined as a state where “the individual realizes his or her own potential, can cope with the normal stresses of life, can work productively and fruitfully, and is able to make a contribution to her or his community.” (WHO, 2014). Positive psychology is one approach which focuses mainly on these aspects and tries to enhance the life satisfaction and the talents of the person (Lee Duckworth, Steen, Seligman, 2005). Many studies showed that positive psychology interventions have a positive influence on happiness and well-being and reduce depression scores. But the adherence seems to be a problem especially at online interventions (Bolier, Haverman, Kramer, Westerhof, Riper, Walburg, Boon, Bohlmeijer, 2013). How could this problem be solved? Is a more fun intervention a possible way? With this investigation it will be tested if gamification could be the answer to enhance the enjoyment and therefore the intrinsic motivation of participants of an online positive psychology intervention.

### 1.1 Positive Psychology Interventions

According to Martin Seligman (2002), psychology consists of three aspects: curing illnesses, making life for people more satisfying and to encourage talents of the individual. But when thinking of psychology for a long time, exclusively the pathology came to people’s mind. After World War II, pathologies and curing psychological illnesses was the aspect only focused on. This focus was reinforced by many empirical researches and great and useful findings they brought to psychology and the whole population (Seligman, 2002). But this is still not everything psychology has to offer.

Positive psychology is an approach to psychology which emphasizes on the good aspects and the talents of a person and tries to include the two aspects of psychology which were neglected before (Seligman, 2002; Lee Duckworth, Steen, Seligman, 2005). It aims at increasing the quality of life with positive experiences and helps grow people’s talents in place of just making them functional again and cures their illnesses. Positive psychology interventions aim to enhance positive emotions, positive individual traits, positive experiences and thoughts through specific methods, exercises and activities (Lee Duckworth, Steen, Seligman, 2005; Sin, Lyubomirsky, 2009). Methods of positive psychology which seem to have a good effect are for example setting personal goals (Sheldon, Kasser, Smith, Share, 2003), utter thankfulness or counting the personal blessings (Seligman, Steen, Park, Peterson, 2005). These interventions can be useful for people who suffer from psychological illnesses like depression or anxiety but also for people without them. These people can benefit from this intervention because they prevent mental disorders, advance well-being and therefore increase the quality of life (Seligman, Csikszentmihalyi, 2014). This was also found out in a meta-analysis where 40 positive psychology studies were accurately analyzed. It was found that subjective and psychological well-being was improved and depression scores were decreased with a small to moderate effect size (Bolier, Haverman,

Westerhof, Riper, Smit, Bohlmeijer 2013).

An example of the effects of positive psychology interventions is the 15-month follow-up study of Cohn and Fredrickson (2010). Here the participants took part in a loving-kindness meditation intervention which showed a lasting positive influence on the mental resources for the life of the participants, whether they continue to do the intervention exercises or not. The user experienced more positive emotions if they continued meditating. A meta-analysis of randomized controlled studies about positive psychology interventions demonstrated that most of these interventions were in a self-help manner which suits the thought of positive psychology (Bolier et al., 2013). The self-help format is a good way to make this kind of interventions available for more people, so also people without pathology can benefit from them. They can do the exercises at home and without the need to go to groups or the supervision of a health care professional.

## 1.2 Online Positive Psychology Interventions

This self-help format can be easily implemented in an online intervention because here the people can work independently and anytime and anywhere they want. Other positive aspects of online interventions are that they make the availability even bigger and easier. Therefore, the participants do not need any form of materials except for a computer or smartphone. People who do not have the opportunity to visit a face-to-face intervention due to their rural place of residence or due to personal issues like illnesses will profit from an internet based offer (Mitchell, Stanimirovic, Klein, & Vella-Brodrick, 2009). This enhances also the anonymity which is also a positive aspect of online interventions (Mitchell, Vella-Brodrick, Klein, 2010). Moreover, people without a psychological pathology will more likely participate in a simple online intervention than for example group sessions. So here could positive psychology interventions easily used as prevention for psychological illnesses. Furthermore, gives the internet many opportunities for different kind of psychological interventions. So texts on their own or with interactive elements could be used where the user has to write down things or be active in another manner. Videos or audio files can be used as a different way to stimulate the user. Even a kind of in-person communication could be possible with the use of video chats (Childress, 2000). These opportunities make internet intervention interactive and easy to individualize. A further benefit is the decreased cost because fewer materials like working sheets have to be used. Also it is probable that less professional staff is required so the development costs pay off (Mitchell, Vella-Brodrick, Klein, 2010).

The online forms of positive psychology interventions show, like the offline forms, a positive effect for the participants. One example for an online positive psychology intervention is the “Nine beautiful things” intervention from Proyer, Gander, Wellenzohn and Ruch (2016). The experimental group of 113 participants was asked to write down nine beautiful things of three different life aspects. It was found that the experimental group had a significant growth of happiness. Another online positive psychology humor-based intervention showed an increased happiness score of the participants in the

experimental group up to six months after the intervention. Furthermore, was the depression score decreased in the time of the intervention (Wellenzohn, Proyer, Ruch, 2016). These studies indicate that also the online forms of positive psychology interventions are a good way to enhance the happiness of their participants.

But they also have their disadvantages. A research about an online positive psychology intervention for mildly depressed adults shows that the well-being of the experimental group is significantly higher than that of the control group, till two months after the intervention. The depressive symptoms were even significantly reduced after six months. Thus, the effectiveness of online positive psychology interventions is also in this case conspicuous but there was one major problem. The drop-out rate of the experimental group with the positive psychology intervention was with 37.8 % more than 15% higher than the drop-out rate of the control group, which was 22.7% (Bolier, Haverman, Kramer, Westerhof, Riper, Walburg, Boon, Bohlmeijer, 2013). This means that in the experimental group 15% more people the intervention stopped prematurely. Furthermore, there was another online positive psychology intervention with the problem of non-adherence from Sergeant and Mongrain (2014). They analyzed if positive psychology exercises which should strengthen the optimism skills of the participants have influence on the well-being. The drop-out rate was in this case about 75% in the time of the two months intervention. To forestall the problem of high drop-out rates at online positive psychology interventions a solution must be found, so more people could profit from the positive influence of positive psychology interventions.

### 1.3 Gamification

One aspect which became more popular in the last years and was used to enhance the motivation of participants is gamification. Especially in online interventions this tool is used to upgrade their results (Monterrat, Lavoué, George 2014). In this paragraph this subject will be further analyzed to see if this could be a suitable solution to increase the adherence of online positive psychology interventions. Gamification can be defined as a use of game-like or fun elements to enhance learning and engagement (Kapp, 2012). So game is a crucial characteristic and a setting where enjoyment usually occurs (Blythe, Overbeeke, Monk, Wright, 2004). This aspect will be further analyzed in the next paragraph to see if it is possibly an influential on adherence of participants. A theoretical review of this year showed that gamification increases the engagement of pupils in their learning process when applied (Busarello, Ulbricht, Fadel, de Freitas e Lopes, 2016). A literature review on the topic of gamification showed that gamification in general has a positive effect on the results, but its effect depends on the context of the research and the user (Hamari, Koivisto, 2014). One example could be the gender of the user because of multiple researches showed that the effect of gamification is influenced by it. It became obvious in one research that boys seem to profit more from game elements in an e-learning environment (Pedro, Lopes, Prates, Vassileva, Isotani, 2015). A further study of Kickmeier-Rust and Albert (2013) showed that gamification elements in an educational computer program for children were effective in

increasing the motivation of the users. This effectiveness was dependent on the used type of gamification element and the gender of the user. Boys seemed to profit more from competition elements, like comparison of high scores. But women seem to experience a greater social benefit from an intervention with game elements (Koivisto, Hamari, 2014). Due to the different results it is not sure if gamification works for both sexes in a similar way in the context of online positive psychology intervention and if there are different preferences which influence the effect. Because of the positive effects which were found in other areas, it is a promising idea to use gamification to increase the adherence of participants in online positive psychological interventions. But attention should be drawn to the possible gender differences on the effect of gamification.

#### **1.4 Enjoyment**

An increased motivation is one possible approach to heighten the adherence rate of interventions. Most of the participants of one research said about the adherence in personal trainings that the “Lack of motivation” was one of the main reasons for their drop-out (Klain, Rombaldi, Matos, Leitão, Cid, Moutão, 2016). Another research found out that the rate of motivation could be used to predict the non-adherence rate to a restricted extent (de Weert-Van Oene, Gongora, von Sternberg, de Jong, 2015). Motivation has two different forms. On the one hand there is the extrinsic motivation which can be defined as something that comes from the outside and motivates the behavior. For example the goal of a good looking body to do sports. On the other hand, there is the intrinsic motivation; it involves all reasons to do something which come from the inside of a person. So the action itself brings the satisfaction for the person, for example that the person does sport because he experiences it as a fun activity. In their research, Frederick and Ryan (1993) found out that intrinsic motivation towards sports correlates positively with the length and number of workouts per week. So it seems that intrinsic motivation would probably have a greater influence on the adherence rate within an intervention than the extrinsic motivation. But how could intrinsic motivation enhanced? According to Ryan, Fredrick, Lepas, Rubio and Sheldon (1997) one aspect of intrinsic motivation is enjoyment. In this research the definition for enjoyment (thus intrinsic motivation) is “the desire to have fun, pursue interests, be stimulated”. This could influence intrinsic motivation. When people experience fun and enjoyment it is possible that their intrinsic motivation for this activity increases and therefore they keep participating at the intervention. To this point there was not much research conducted about the concept of enjoyment itself. It was often only seen as a part of motivation. Therefore, it is even more important to investigate this concept on a deeper level. Like said above are games a setting where enjoyment usually occurs, which the background knowledge of the relationship of intrinsic motivation and enjoyment gamification seemed like a suitable option for a higher motivation (Blythe, Overbeeke, Monk, Wright, 2004).

## 1.5 Overview

To summarize the findings it can now be said that positive psychology interventions are based on a movement which sees well-being and health not as an absence of psychological suffering but as a positive state of mind. This can be achieved through enhancing for example positive emotions and personal talents. Positive psychology interventions are a great way to increase the well-being of people with or without a psychological illness (Seligman, 2002; Bolier, Haverman, Westerhof, Riper, Smit, Bohlmeijer 2013). To reach many people, an online positive psychology intervention could be used. Yet online positive psychology interventions seem to suffer from a high drop-out rate (Sergeant, Mongrain, 2014). A solution for this problem should be found. To increase the adherence of positive psychological interventions the motivation of the participants must increase. A great way to achieve that is to make sure that the participants enjoy the time they spend on the intervention (Ryan et al., 1997). Till this moment there is little investigation done of the possibilities of gamification for the sector of positive psychology, yet it can be said, based on other fields, that gamification contains potential to increase the motivation of participants which maybe include enjoyment (Busarello et al., 2016). Furthermore tries gamification to include game like elements into an existing system and games are correlated to enjoyment (Sanmugam, Zaid, Mohamed, Abdullah, Aris, Suhadi, 2015). This forms the assumption that the use of gamification enhances the perceived enjoyment of the user which is a major aspect of intrinsic motivation. So in this research all three parts are included. But it was shown that the use of different gamification elements in different settings was differently appealing for male and female participants. It seems that women experience a greater effect when the gamification contains social aspects and men when there is a sort of competition (Kickmeier-Rust, Albert, 2013; Koivisto, Hamari, 2014). When implementing gamification elements to an online positive psychology intervention, it would be more likely that these elements contain more of a social aspect which forms the assumption that women would benefit more in this case. This aspect of a possible gender difference will be investigated. Therefore, online positive psychology interventions which make use of gamification elements to enhance their adherence could adapt the gamification elements so there is no major gender difference in the effect. To summarize all the findings and expectations this research question was established:

***Is there a significant gain on the enjoyment of the participants when doing a positive psychology intervention with gamification elements compared to the same intervention without these elements and is the effect of gamification influenced by the gender of the participant?***

Based on this investigation question and the literature mentioned above three hypotheses were formed. First of all, it was presumed that the perceived enjoyment of participants absolving the online positive psychology intervention with gamification elements is significantly higher than that of participants absolving the same intervention without these elements. The second hypothesis stated that the perceived enjoyment of participants absolving the online positive psychology intervention with



gamification elements is significantly higher by women than men. The third hypothesis which was formed predicated that the gender of the participant is a moderator for the effect of gamification on the perceived enjoyment. To get a deeper insight in the relationship between enjoyment, gamification and the gender of the user and the use of positive psychology interventions, it will also be tested if there is a significant difference between words written by men or women in the exercises. Furthermore, it will be tested if there is a correlation between the perceived enjoyment and the number of words written in the exercises. Because enjoyment is accused to have a major influence on the intrinsic motivation it is expected that participants experiencing more enjoyment during the intervention write more at the exercises in the intervention (Ryan, Fredrick, Lepas, Rubio, Sheldon, 1997). Also, it will be tested if there is a gender difference independent from the version of the intervention. This could explain possibly gender differences in the gamified version.

## 2 Method

### 2.1 Design

To test the hypotheses a between group design was used. The groups were in this case one which got an online positive psychology intervention with gamification elements and one which got the same intervention without these gamification elements. There were two independent variables. One independent variable was the intervention with the two levels with or without gamification elements. The dependent variable is in this case the enjoyment measured by the IMI. The other independent variable was gender with the two levels male and female. The dependent variable was in this case also the enjoyment experienced by the participants. After doing at least two exercises of the intervention, the participants had to complete a questionnaire.

Furthermore, it can be said that the data was collected through an experiment. The participants were randomly assigned to different groups. The participants did not know in which group they were and that there were different versions at all. Also, the researcher did not know which version the partaker got. So the research was double-blind. The whole data collection took place in a laboratory of the social science department of the University of Twente. Therefore, the environment was standardized and had no distraction for the participants. The data which is collected through the questionnaire after the intervention is quantitative.

### 2.2 Participants

Overall there were 80 participants which took part in this research. Five had to be excluded because of incompleteness, not doing the two required exercises, the account of the used intervention could not be associated to the suitable data of the Qualtrics survey or giving unrealistic information (age of 100 years). So the data which was used came from 75 participants. 40 people used the gamified version 35 used the plain version. The participants were recruited on the one hand through the personal network of the researchers and on the other hand through the SONA system of the University of Twente. With this system can students from the university assign to researches in exchange with participation points which they need to graduate. The participants were between 18 and 47 years old and all could understand Dutch. The mean age of the participants is 23. Although all participants could understand Dutch, there were also 57 German participants next to 18 Dutch participants. There were none participants which specified that they come from another country beside Germany and the Netherlands.

In total there were 27 men and 48 women. So the proportion of women (64 %) is larger than that of men (36 %). The mean age of the women was 23 and therefore comparable with the mean age of the men with 22. 3. Out of the group of men 9 participants were Dutch and 18 were German. The group of women was split into 9 Dutch respondents and 39 German respondents.

## 2.3 Materials

For the research an informed consent was needed. The participant agrees with a signature that he was sufficient informed about the research and about what happened with their data and that they take part voluntary. The original informed consent can be found in the Appendix (Appendix 5.1). Further an instruction paper was given to the participant. Here a step by step instruction what the participant had to do was given. This instruction paper also contained a login code which the participant needed to begin the intervention. This login code determined which version of intervention the participant got. They were randomly and blind distributed to one of the versions of the intervention. The original form of the instruction paper is shown in the Appendix (Appendix 5.2). A computer was then used to complete the research. The Dutch positive psychology intervention “Dit is jouw leven” was used. From this intervention there were two versions, one plain intervention and one with gamification elements. Pictures from the plain intervention can be found in Figure 1. The gamified version is presented in Figure 2. Both versions do not differ in the content. Every text used is completely the same. Only the design is different.



Figure 1. Plain Version of the Intervention

The plain version of the intervention has mostly a white background with a blue text and symbols. The text and buttons are both very sober and have no pictures. Around the main field is a blue framework with the title of the intervention and a button to log out. Also, four buttons at the top of the main field show how the site is structured and which part the user sees at the moment. Under that there are four clear symbols, where the user could get information, overview, knowledge and exercises. Then in a smaller font a list of the content is shown. Here the user can click at the wanted exercise. The gamified version is in contrast very lively and more colorful. The main aspect of the screen is a big map

with different areas. The map is gray at the beginning but with further progress and after absolving the different areas it will get more and more colorful. Under the map there are round



Figure 2. Intervention with Gamification Elements

buttons with arrows pointing. In the left corner of the map an old man can be seen in a round frame. Underneath there is the menu consisting out of three different blue symbols. Here the user can get an overview about the intervention, knowledge about the subject and the exercises of the current area. In the left corner of the map the profile picture of the user is shown also in a round frame. Beneath there are nine gray circles which stand for the areas of the map. When absolving one area, the circle gets colored. Above the map there is a gray picture of different landscapes. Next to this there are different buttons in this picture. In a black frame above the map there are further 4 buttons with the inscriptions, “kaart” (map), “Profiel” (profile), “Hulp” (help), “Over ons” (About us). The background of the screen is blue.

There were two exercises which had to be done by the user. The first one was “drie goede dingen oefening” (three good things exercise) here the user had to write three good experiences of the last day. The second task was “schrijven over positieve herinneringen” (writing about positive memories) where the participants had the task to write down a personal positive memory which makes them happy thinking about it.

The second important part of the research was the questionnaire afterwards. First demographics of the participant were asked. A main aspect in this questionnaire is the sub scale of Intrinsic Motivation Inventory (IMI), to test the hypotheses. This is a seven items scale which could be used to measure the interest and enjoyment of the respondent. Therefore, a seven-point Likert scale was used to appraise the

concepts which were asked for in the items. The participant should evaluate with the help of the Likert scale his agreement with the seven statements of the items. Within this Likert scale a one is translated to “absoluut onwaar” (absolutely not true) and a seven is translated to “absoluut waar” (absolutely true). Two of the seven items were messages stated in a negative manner, for example “I found this was a boring activity”. The other five items were positive statements, for example “I would describe this activity as very interesting”. The Intrinsic Motivation Inventory was invented by Ryan in 1982. A study from Tsigilis and Theodosiou with a Greek translation of this inventory showed that the intra class correlation of the enjoyment/interest sub scale is about 0.86 and that from the whole questionnaire is 0,7 (Tsigilis, Theodosiou, 2003). The used form of the sub scale of the IMI can be seen in the Appendix (Appendix 5.3). In the end the participant could fill in the number of their personal SONA account so they could receive the SONA point for participating in this study.

## 2.4 Procedure

Before the research started it was sent to the ethical commission of the University of Twente. They proofed that the structure and question were ethically justifiable. With the SONA system the students could assign to a specific time slot for the research. When this time has come the participant had to go to the laboratory where the researcher waited for him. Before doing the exercises and questionnaire of the research the participants were asked to read and sign the informed consent (Appendix 6.1). Then an instruction paper was given to them (Appendix 6.2). The supervising researcher gave the option to the partaker to go to his desk at any moment in this research if there were any questions or problems during the research. Then the participant was left alone in the room with the computer to absolve the research. The two needed websites (that of the intervention and that of the questionnaire) were opened before the participant arrived so he could begin right away.

With the instruction paper the participant got a step by step order to go through this research. Also, the login data was given on it. These introduction papers were equal for every participant, without reference to the version of the intervention. The first step of this paper was to take a seat behind the computer in the laboratory. Secondly the participant should have visited the web-site of the intervention which was already set in the browser. There a login screen was seen. The third step said that the participant should login with the account data which stood on the instruction paper. After that it was asked to read the instructions of the intervention. At the gamified version of the intervention the participant had to click on the purple circle next to area one. At the plain version a list was found where the first point of the introduction was. At both versions the participant had to use the arrows at the bottom of the text to go a page further. Then the participant should have visited the lessons block “stad van positieve emoties” (City of positive emotions). This could have been found in the version with the gamification elements in area one which was presented as a small city on the map. At the plain intervention it was just the second point on the list, under the introduction point. Then an initiation about the topic positive emotions was given. After reading this, the participant got a list with several

exercises. Within this block at least two exercises should have been done, on the one hand the “drie goede dingen-oefening” (three good things-exercise) which was exercise three and on the other hand “schrijven over positieve herinneringen” (writing about positive memories) which was exercise four. With clicking on the square next to the name of the exercise, the exercise itself opened on the right side. There it was explained what the participant should do and field was given where he could write a text to answer the questions of the exercises. It was said on the instruction paper that the participant should use the day before as a base for these exercises. After writing the text, the participant had to click on “opslaan” (save) to save his answer. Once doing the two exercises, the participant was free to do more. When he wanted to finish the intervention, he had to log out from the website. During this step a log data saved the texts, the time the participant spent etc.

The next step was to fill in the questionnaire which was open in another tab of the browser. First a short introduction was given then the participant had to fill in his login data again. After that the questionnaire began by, firstly calling for the demographics of the partaker. In the following it was asked to fill in different questionnaires or sub scales of questionnaires. In this case just the sub scale of the IMI is important to test the hypotheses. The last and therefore eighth step was if every step was done, to give the instruction paper back to the researcher. The researcher then asked the participant if he had any questions or remarks towards the research. A couple of days after completing the research the participant got the point for his SONA account.

## 2.5 Analysis

To test the hypotheses the collected data first had to be transferred from Qualtrics, where it was collected to an analysis program. In this case the statistic program SPSS was used. The data was first screened and a number of cases had to be deleted. Then further variables were added which include the number of words the participants wrote in the exercises, the number of words which they wrote in the “uitdaging”, which version of the intervention the participants had and the number of exercises the participants had absolved. This information was from the log data which was collected per user during the participation.

Before the data could be analyzed, a total enjoyment score had to be calculated. Therefore, two of the seven items had to be rescaled first because they were asked in a negative manner. After that all items could be compared and a sum score was calculated which described the perceived enjoyment of the participants completing their version of the intervention. This score was transformed into a further variable to make the analysis easier. Then it was tested if this variable, thus the perceived enjoyment is normal distributed. Therefore, the Kolmogorov-Smirnov was used. The results were not significant which indicates that the perceived enjoyment is normally distributed. Also, it was tested if the number of words is normally distributed with the Kolmogorov-Smirnov test. In this case it was found that there is no normal distribution. A further sign for the normal distribution are the histograms which show a relatively normal distribution. Then the reliability of the sub scale of the Intrinsic Motivation Inventory

was calculated and described through the Cronbachs alpha. The Cronbachs alpha for this sub scale is 0.94. This high value implies that the results of this test are reliable.

Then a descriptive analysis was implemented where the demographic information was investigated. Especially the distribution within the sexes was analyzed. Also, the mean of the perceived enjoyment was calculated dependent on the version of the intervention and the gender. Other means which were calculated were from the number of exercises and the number of words written in the exercises. After that two t-tests were carried-out. One tests the difference of the perceived enjoyment between the two versions of the intervention. The other tests the difference of the perceived enjoyment between men and women in the group with the gamified intervention. To test if the gender is an influential factor of the relationship between the gamification version and the perceived enjoyment a moderator analysis was done. Therefore, a moderator variable was computed and then a regression analysis was done with the variables: version of the intervention, gender and the moderation variable.

To get a deeper insight two other analysis were implemented. Firstly it was tested if there is a significant difference between the number of words written in the exercises between men and women. This was done with the Mann-Whitney-U test. Moreover, it was checked if there was a gender difference towards the perceived enjoyment on the whole. Finally, it was also tested if there is a correlation between the perceived enjoyment of the user during the intervention and the number of words they wrote in the exercises.

### 3 Results

The descriptive analysis is presented in table 1 and showed that the mean score of the perceived enjoyment is 29.587. On an average 2.547 exercises were done where 153.52 words were written averagely.

**Table 1**

*Descriptive analysis from enjoyment, number of exercises done and words written*

	mean	Standard Deviation (SD)	Minimum	Maximum
Enjoyment	29.587	7.057	14	44
Number of exercises	2.547	0.920	2	6
Number of words written	153.52	97.052	30	469

The results of the t-test to test if there is a difference in the perceived enjoyment between the genders or the version can be seen in table 2. The mean score of perceived enjoyment is with 31.075 higher of the group with the gamified version of the intervention. The participants with the plain version of the intervention had on average a perceived enjoyment score of 27.886. The t-test indicates however that this difference is not significant ( $p = .051$ ). As a consequence to this test it can be said, that the first hypothesis has to be rejected. Even though there is a difference between the two versions of the intervention, even in the predicted direction, this difference is not significant. However, this result is very narrow to be significant.

Within the group of the intervention with gamification elements there can also be a difference seen in the perceived enjoyment between male and female participants. Women with the gamified version had on average a perceived enjoyment of 31.655. This score is higher than that of men in the same group. Their mean score is 29.546. The t-test which was implemented within the group of the intervention with gamification elements proves that also this difference is not significant ( $p = .708$ ) (see table 2). Regarding the second hypothesis it can be said that this has to be rejected, too. So female participants do not perceive a higher enjoyment than male, when using the intervention with gamification elements.



**Table 2***Differences of the perceived enjoyment between the versions and the gender*

		mean	Standard Deviation (SD)	t	Degree of freedom (df)	p
Version	Gamified	31.075	6.650	1.988	73	.051
	Non-gamified	27.886	7.239			
Gender in total	Men	28.259	7.867	1.224	73	.225
	Women	30.333	6.543			
Gender in the gamified version	Men	29.546	7.941	0.378	33	.708
	Women	31.655	6.149			

In the end a moderator analysis was done to let see if the gender of the participant influences the relationship between the version of the intervention and the perceived enjoyment of the participant. It became clear that gender is not a moderator for the relationship. The moderator analysis was not significant ( $p = .734$  with  $t(73) = 0.341$ ). Thus, also the third hypothesis can be rejected. In the end these analyses were done again after cutting off extreme scores of perceived enjoyment to see if this could reduce the standard deviation and therefore a significant difference occurs. In none of the analyses this was the case.

The further analysis which does not directly test the hypotheses but bring a deeper insight showed that there is a significant difference between the gender and the number of words written. It showed that women seem to write significantly more with averagely 176.31 words in the exercises than men with 113.0 words ( $p = .005$  with  $u(73) = 391.500$ ). Also, there was no significant difference found of the perceived enjoyment between men and women independent of the version of the intervention ( $p = .225$ ). Women rate on average an enjoyment score of 30.333 whereas men rate 28.259 (see table 2). Furthermore, it became obvious that there is no significant correlation between the amount of words which were written in the exercises and the perceived enjoyment of the participants ( $p = .162$ ).

## 4 Discussion

### 4.1 Conclusion

The data which was collected and analyzed showed in first place that the user of an online positive intervention with gamification elements did not perceive a significant higher enjoyment than user of the same intervention without the gamification elements. But because of the nearly significance it is hard to clearly answer the research question. A gain in enjoyment in the intervention could be seen when gamification is applied but it is still not significant. This is one difference to the found literature. So showed one study where gamification was applied to a system called SAP ERP that this significantly enhanced the enjoyment of the participants of the use and their intention to use this system (Herzig, Strahringer, Ameling, 2012). Another study showed that the effect of gamification is dependent on the context of the intervention (Hamari, Koivisto, Sarsa, 2014). So maybe an unfavorable context was in this intervention the reason which made the small difference between significant and non-significant gain of enjoyment. Possible influential circumstances will be analyzed in the next paragraph. Based on further literature it was expected that the different effect is because of the gender of the user. It was expected based on the research of Kickmeier-Rust and Albert in 2013 and the research of Koivisto, Hamari (2014) that the women seem to score greater on the enjoyment because they profit more when social aspects seem to be spoken to with the gamification elements. Furthermore, there were no competitive elements which indicate in a greater effect experienced by boys. Because that a positive psychology intervention can be more linked to social aspects it was expected that women scored higher. This was the second main aspect of this research. It became obvious that neither the women higher scored nor that there was any significant gender difference found on the perceived enjoyment within the group with the gamification version of the intervention. In consideration of the research question this finding showed the tendency that the effect of gamification was not dependent on the gender. But to really be sure about this a moderator analysis had to be implemented. The moderator analysis tested if the gender is a moderating variable and therefore has influence on the relationship between the perceived enjoyment of the user and the version of the intervention. As well as in the cases before here was no significant finding. Further it could be said that in this case the gender of the user had no influence of the effect of gamification on the perceived enjoyment. So was the linked set from social aspects to the topic of positive psychology a false assumption or in such a weak manner that it had not an influence. The results showed that the exercises and application of gamification was gender neutral towards the perceived enjoyment. Also, showed further analysis that there was no significant difference of perceived enjoyment between men and women towards the whole intervention so this supports the new built assumption that positive psychology works alike for both sexes. The further analysis which was made demonstrated that there was a significant difference in the number of words written in the exercises between men and women. It was expected that when there was no difference in the perceived enjoyment that the intrinsic motivation is also relatively the same of the gender. Thus, this result does

not really fit this hypothesis because when women wrote significantly more it will be assumed that they have more motivation. But after research about this topic it became clear that this difference is normal. So a research about the length of SMS showed that female students seem to write longer texts than male (Keong, Gill, Noorezam, Abdulrazaq, 2012). Also, girls in middle childhood seem to write significantly longer texts in narrative writings (Williams, Larkin, 2013). Furthermore, showed the final analysis that the number of words and the perceived enjoyment do not correlate. This fits the findings above that women write more without a significant higher perceived enjoyment. But this finding is majorly conflictive with literature which stated that enjoyment is an important aspect of intrinsic motivation which should lead to longer texts in this case (Ryan et al., 1997; Frederick, Ryan, 1993). But to make the concept of intrinsic motivation completely dependent on the number of words written in the exercises would not do justice for this complex concept. There are many other aspects which also indicate the intrinsic motivation, like the number of exercises done. Also, the number of words written could be also dependent on the linguistic talent of the participant. So there are many possible explanations for this inconsistent finding.

The expectations which were based on the found literature about gamification enjoyment and gender which led to the research question and three hypotheses were found wrong in this case. Even though there are tendencies which all supported the three hypotheses, none of the differences were significant. This research showed that gamification when applied to online positive psychology intervention does not automatically improve the enjoyment of the participant.

#### **4.2 Limitations and Implications**

The research had some flaws but also positive points. Asking the participants they said that the intervention in general had too much text and was partly confusing. This was for both version of the intervention the case. One participant told in the debriefing hat it took way to long before she could finally become active in the intervention. A research about the application of gamification on an e-banking system showed that the perceived enjoyment during the use and the ease of use are interrelated (Rodrigues, Oliveira, Costa, 2016). This could be explanation why the application of gamification does not give the expected gain in enjoyment. This could also be one of the contextual points which influence the effect of gamifiaction according to Hamari, Koivisto and Sarsa (2014). Further confusion was because of the instruction paper (see Appendix 5.2). For both interventions one instruction paper was used, terms used in this instruction were sometimes confusing for the user of one version. So was the term “stad van positieve emoties” (city of positive emotions) used which made no sense in the plain version of the intervention. The point of too much text but could be one aspect to focus on with gamification. This could be also one factor which majorly reduces the enjoyment in this case and made the positive and playful and more active effect of gamification nearly useless. There could be the opportunity to playfully integrate videos or make the content of the text understandable in more interactive manner. So this could be seen as a missed opportunity to apply gamification. Maybe if

gamification is even more integrated in the intervention the effect of gamification could become more obvious. Another flaw of this study is that there were no norm scores for the Intrinsic Motivation Inventory available. So it was not possible to compare the scores of this study with the population. Maybe the scores of this study were significant lower than the norm scores this would indicate that there should be major modifications in the whole intervention. At this point such statements cannot be done. A positive aspect of the research is the reliability. The Cronbachs alpha of the sub scale of the Intrinsic Motivation Inventory is with 0.94 very high. The experimental design is a further positive aspect of the research, so the direct effect of gamification could be seen as it is the only changed variable. But a downside of the participants is that most of them are psychology students which are biased by their study field. They think more on a meta-analysis about such an intervention which became also clear in this study. Many of the psychology participants made statements about use possibilities instead of just accepting the intervention as a task for them personally. With their experiences of researches and interventions in mind it is possibly that they absolve the exercises of the intervention differently, for example told a participant that he wrote more detailed so there was enough content to code and analyze.

This study showed a nearly significant difference in the perceived enjoyment of the user between the versions of the intervention. With some modifications it will be assumed that this tendency could become significant which then supports the literature before, that gamification enhances the enjoyment of its users. In further study it should be tested if a more integrated form of gamification, like more interactive gamification elements or less text would raise the enjoyment of the participants. Also, it is important to get a deeper insight between the correlation of the aspect of ease-to-use and the enjoyment in gamification. This could explain the non-significant findings in this case. To upgrade this research it would be good to rework the instruction paper to make them more consistent with the inventions. Also, it would be good to pay more attention on the simplicity of the intervention because studies before indicated a correlation between it and the enjoyment of the participants. Furthermore, the sample should involve more people besides psychology students so the results are not biased by their experiences. Another interesting conflict is that of the perceived enjoyment and the number of words written in the exercises of the intervention. It should be tested how enjoyment, intrinsic motivation and writing text correlate together.

Finally it can be said that it is not enough to just use some gamification elements in an online positive psychology intervention and to expect that the participants experience more fun doing the exercises of the intervention. However, the findings showed a great tendency in this direction. Maybe a simpler version would make the difference and show the potential of gamification also for the enjoyment of the user. A positive point which was found out with this research is that the used gamification elements seem to be more gender neutral than studies before indicated. So it is not absolutely necessary that positive psychology interventions have to get more individualized and specialized for the gender of the user to enhance the effect of men for example

## 5 Appendix

### 5.1 Informed Consent

#### Toestemmingsverklaring

Voor deelnemers aan het onderzoek naar de korte termijn effecten van de positief psychologische interventie 'Dit is jouw leven'

- Ik verklaar hierbij voldoende te zijn ingelicht over de aard, methode en doel van het onderzoek.
- Ik heb voldoende tijd gehad om over mijn deelname na te denken. Ik ben in de gelegenheid geweest om vragen te stellen. Deze vragen zijn naar tevredenheid beantwoord.
- Ik weet dat mijn antwoorden enkel worden gebruikt voor wetenschappelijk onderzoek.
- Ik weet dat de gegevens en resultaten van het onderzoek alleen anoniem en vertrouwelijk aan derden bekend gemaakt zullen worden.
- Ik stem geheel vrijwillig in met deelname aan dit onderzoek. Ik behoud me daarbij het recht voor om op elk moment zonder opgave van redenen mijn deelname aan dit onderzoek te beëindigen.

### 5.2 Instruction Paper

#### Instructieblad voor deelnemers

Welkom bij het onderzoek naar de korte termijn effecten van de positief psychologische interventie "Dit is jouw leven". Hieronder staat stapsgewijs uitgelegd wat je moet doen.

1. Neem plaats achter de laptop.
2. Ga naar de website [www.ditisjouwleven.com](http://www.ditisjouwleven.com). Deze staat reeds klaar in de browser.
3. Log in met het onderstaande inlogaccount en wachtwoord.

**Inlogaccount: testXX@utwente.nl**

**Wachtwoord: testtestXX**

4. Lees de introductie.
5. Ga naar de "stad van positieve emoties".
6. Doe minimaal de volgende 2 oefeningen: "drie goede dingen-oefening" en "schrijven over positieve herinneringen". Je hoeft deze oefeningen maar één keer te doen, neem daarbij telkens de *vorige dag* als uitgangspunt.
7. Vul de vragenlijst in via <https://goo.gl/loNrTT>. Deze staat reeds klaar in de browser.

8. Als je alle stappen (1 t/m 7) doorlopen hebt, lever dan het instructieblad in bij de onderzoeker(s).

### 5.3 Subscale of the IMI

Geef voor elk van de volgende uitspraken aan in hoeverre dit van toepassing is op jou. Met *activiteit* bedoelen we het werken met de positief psychologische interventie "Dit is jouw leven".

	1 Absoluut onwaar	2	3	4 Enigszins waar	5	6	7 Absoluut waar
1. Ik genoot er erg van om deze activiteit te doen.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. Deze activiteit was leuk om te doen.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. Ik vond dit een saaie activiteit.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4. Deze activiteit hield mijn aandacht helemaal niet vast.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5. Ik zou deze activiteit beschrijven als heel interessant.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6. Ik vond deze activiteit best aangenaam.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7. Terwijl ik de activiteit aan het doen was, bedacht ik me hoeveel ik er van genoot.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

0%  100%

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## 6 References

- Blythe, M. A., Overbeeke, K., Monk, A. F., Wright, P. C. (2004). *Funology: from usability to enjoyment* Volume 3. Springer Science & Business Media.
- Bolier, L., Haverman, M., Kramer, J, Westerhof, G.J., Riper, H., Walburg, J. A., Boon, B., Bohlmeijer, E. (2013). An internet-Based intervention to promote mental fitness for mildly depressed adults: Randomized controlled trial. *Journal of Medical Internet Research* Volume, 15. doi: 10.2196/jmir.2603
- Bolier, L., Haverman, M., Westerhof, G. J., Riper, H., Smit, F., & Bohlmeijer, E. (2013). Positive psychology interventions: A meta-analysis of randomized controlled studies. *BMC Public Health*, 13(1) doi:10.1186/1471-2458-13-119
- Busarello, R. I., Ulbricht, V. R., Fadel, L. M., De Freitas e Lopes, A. V. (2016). Gamification Approaches to Learning and Knowledge Development: A Theoretical Review. *New Advances in Information Systems and Technologies* Volume 444, 1107-1116. Doi: 10.1007/978-3-319-31232-3\_105
- Childress, C. A. (2000). Ethical Issues in Providing Online Psychotherapeutic Interventions. *J Med Internet Res*, Volume 2. Doi: 10.2196/jmir.2.1.e5
- Cohn, M. A., Fredrickson, B. L. (2010). In search of durable positive psychology interventions: Predictors and consequences of long-term positive behavior. *Journal of Positive Psychology*
- Frederick, C. M., Ryan, R. M. (1993). Differences in motivation for sport and exercise and their relationships with participation and mental health. *Journal of Sport Behavior*, 16, 125-145
- Hamari, J., Koivisto, J., & Sarsa, H. (2014). Does gamification work?--a literature review of empirical studies on gamification. In *System Sciences (HICSS), Hawaii International Conference* 3025-3034. Doi:10.1109/HICSS.2014.377
- Herzig, P., Strahringer, S., Ameling, M. (2012). Gamification of ERP systems-Exploring gamification effects on user acceptance constructs. *Multikonferenz Wirtschaftsinformatik* (pp. 793-804). Braunschweig: GITO.
- Kapp, K. M. (2012). *The gamification of learning and instruction: game-based methods and strategies for training and education*. John Wiley & Sons.

- Kickmeier-Rust, M., & Albert, D. (2013, January). Gamification and Intelligent Feedback Mechanisms for a Division Learning Tool. In *European Conference on Games Based Learning* (p. 290). Academic Conferences International Limited.
- Klain, I., Rombaldi, A. J., Matos, D., Leitão, J. C., Cid, L., & Moutão, J. M. (2016). Adherence and dropout in personal training programs. [Adesão e desistência de programas de treino personalizado] *Revista Iberoamericana De Psicologia Del Ejercicio y El Deporte*, *11*(1), 15-21.
- Keong, Y. C., Gill, S. K., Noorezam, M., & Abdulrazaq, A. (2012). Gender differences and culture in english short message service language among malay university students. *3L: Language, Linguistics, Literature*, *18*(2), 67-74.
- Koivisto, J., Hamari, J. (2014). Demographic differences in perceived benefits from gamification. *Computers in Human Behavior*, *Volume 35*, June 2014, Pages 179-188, doi: 10.1016/j.chb.2014.03.007
- Lee Duckworth, A., Steen, T. A., & Seligman, M. E. (2005). Positive psychology in clinical practice. *Annual Review of Clinical Psychology*, *1*, 629-651.
- Mitchell, J., Stanimirovic, R., Klein, B., & Vella-Brodrick, D. (2009). A randomised controlled trial of a self-guided internet intervention promoting wellbeing. *Computers in Human Behavior*, *25*, 749-760.
- Mitchell J., Vella-Brodrick, D., Klein, B. (2010). Positive Psychology and the Internet: A mental health opportunity. *Electronic Journal of Applied Psychology*, *6* (2), pp. 20-41
- Monterrat, B., Lavoué, E., George, S., (2014). Motivation for Learning: Adaptive Gamification for Webbased Learning Environment. *6th International Conference on Computer Supported Education*. pp.117-125
- Pedro, L. Z., Lopes, A. M. Z., Prates, B. G., Vassileva, J., Isotani, S. (2015). Does gamification work for boys and girls? an exploratory study with a virtual learning environment. Paper presented at the *Proceedings of the ACM Symposium on Applied Computing*, , 13-17-April-2015 214-219. doi:10.1145/2695664.2695752
- Proyer, R. T., Gander, F., Wellenzohn, S., Ruch, W., (2016). Nine beautiful things: A self-administered online intervention on the beauty of nature, arts, and behaviors increases happiness and ameliorates depressive symptoms. *Personality and Individual Differences Volume 94*, 189-193, doi: 10.1016/j.paid.2016.01.028



- Rodrigues, L. F., Oliveira, A., & Costa, C. J. (2016). Does ease-of-use contributes to the perception of enjoyment? A case of gamification in e-banking. *Computers in Human Behavior*, *61*, 114-126. doi:10.1016/j.chb.2016.03.015
- Ryan, R. M., Fredrick, C. M., Lepes, D. S., Rubio, N., Sheldon, K. M. (1997). Intrinsic motivation and exercise adherence. *Int J Sport Psychol*, *28*(4), 335-354.
- Sanmugam, M., Zaid, N. M., Mohamed, H., Abdullah, Z., Aris, B., Suhadi, S. M. (2015). Gamification as an educational technology tool in engaging and motivating students; an analyses review. *Advanced Science Letters*, *21*(10), 3337-3341. doi:10.1166/asl.2015.6489
- Seligman, M. E. P. (2002). Positive psychology, positive prevention, and positive therapy. *Handbook of positive psychology*, *2*, 3-12.
- Seligman, M.E.P., Csikszentmihalyi, M. (2014). *Positive Psychology: An Introduction*. Flow and the Foundations of Positive Psychology. Niederlande: Springer, 279-298.
- Seligman, M.E.P., Steen, T.A., Park, N., Peterson, C. (2005). Positive psychology progress: empirical validation of interventions. *Am Psychol.*, *60*: 410-421.
- Sergeant, S., & Mongrain, M. (2014). An online optimism intervention reduces depression in pessimistic individuals. *Journal of consulting and clinical psychology*, *82*(2), 263.
- Sheldon, K. M., Kasser, T., Smith, K., Share, T. (2003). Personal goals and psychological growth: testing an intervention to enhance goal attainment and personality integration. *Journal of Personality S2- Character & Personality; A Quarterly for Psychodiagnostic & Allied Studies*, *70*,5-31
- Sin, N. L., Lyubomirsky, S., (2009). Enhancing well-being and alleviating depressive symptoms with positive psychology interventions: a practice friendly meta-analysis. *Journal of Clinical Psychology Volume 65*, 467-487
- Tsigilis, N., Theodosou, A., (2003). Temporal stability of the Intrinsic Motivation Inventory. *Perceptual and Motor Skills, Volume 97*, 271-280, doi: 10.2466/pms.2003.97.1.271
- de Weert-Van Oene, G. H., Gongora, V., von Sternberg, K., & de Jong, C. A. J. (2015). Motivation for treatment and motivation for change in substance-dependent patients with co-occurring psychiatric disorders. *Journal of Psychoactive Drugs*, *47*(5), 393-400. doi:10.1080/02791072.2015.1079669

Wellenzohn, S., Proyer, R. T., & Ruch, W. (2016). Humor-based online positive psychology interventions: A randomized placebo-controlled long-term trial. *Journal of Positive Psychology*, , 1-11. doi:10.1080/17439760.2015.1137624

WHO (World Health Organisation) (2014). Mental health: a state of well-being. Received on 11<sup>th</sup> of June 2016, from [http://www.who.int/features/factfiles/mental\\_health/en/](http://www.who.int/features/factfiles/mental_health/en/)

Williams, G. J., & Larkin, R. F. (2013). Narrative writing, reading and cognitive processes in middle childhood: What are the links?. *Learning and Individual Differences*, 28, 142-150.