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Should Users Be Given a Choice About Gamification?

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Abstract

Gamification is a rather novel concept of applying game elements to non-gaming contexts, aiming at transferring the motivational benefits of games to other tasks. Due to the widespread application of game elements to non-gaming contexts some researchers have expressed concern about the motivational and ethical aspects of compelling the users of a system to interact with gamification. Thus, this master's thesis aims to explore the influence of choice about gamification on intrinsic motivation and need satisfaction. A total of 166 participants were provided with either choice or no choice, and started the task with or without gamification. The experiment yielded no significant influence of choice on intrinsic motivation or need satisfaction in the context of gamification. Yet, the majority of the participants, if able, did make the choice to use gamification. Further, the availability of choice did not show any detrimental effects on intrinsic motivation and need satisfaction. Nevertheless, the findings of this master's thesis indicate that the importance of choice may differ between non-obligatory contexts, such as this study, and mandatory contexts, such as work or school.

Should Users Be Given a Choice About Gamification?

Introduction

Digital games have become ubiquitous in today's world. From smartphone games to computer games, a vast number of people engage with them on a daily basis (*ESA Annual Report*, 2015). This rise in digital entertainment has lead designers to employ game design elements in everyday, non-game-related tasks. This process is commonly known as gamification (Deterding, Dixon, Khaled, & Nacke, 2011). These non-game related tasks range from marketing (e.g., Starbucks Rewards Card) to education (e.g., Barata, Gama, Fonseca, & Gonçalves, 2013; Barata, Gama, Jorge, & Gonçalves, 2013, 2014).

A recent example is the YouTube Heroes program (*YouTube Heroes*, 2016), allowing users to gather points for helping out the YouTube staff, community and gaining advanced privileges, similar to forum moderators. Another, large scale example is Sesame Credit, which in short, is a system implemented in China, which awards points for behaviour deemed good by the Chinese government and revokes points for behaviour deemed bad (Hatton, 2015), ranks the participants and awards benefits or punishes them accordingly. Examples of gamified educational scenarios include gamifying elementary classrooms to practice spelling and maths, encourage physical activity (e.g., Watson, Mandryk, & Stanley, 2013) or gamifying whole university courses (e.g., Barata, Gama, Jorge, & Gonçalves, 2013; Hanus & Fox, 2015; Li, Grossman, & Fitzmaurice, 2014).

The aforementioned increase in gamified systems in recent years has sparked an ongoing debate about gamification and its ethical implications. Bogost (2012, 2015) claims that gamification is merely a means of exploitation, employed by the implementing party. In Bogost's (2011) words, *exploitationware* takes advantage of the users, engaging with the gamified layer, in order to gain a relatively larger share of the overall benefits. In contrast, Kim (2015) notes that asymmetrical gains do not inherently render an activity exploitive. Yet, the possibility to use gamification as exploitationware (Bogost, 2011) is not ruled out.

Another area of concern is the manipulation of the users. *Bullshitification*, as coined by Kim (2015), describes the process of becoming detached from the reason for performing the core task and rather focussing on the game elements. This statement is in line with other

authors suggesting that gamification should support the core task, rather than overshadow it (e.g., Knaving & Björk, 2013).

Further, the voluntariness of interacting with games and gamification is considered an important facet. McGonigal (2011) argues that a game inherently relies on voluntary participation in order to be perceived as such. Accordingly, Werbach (Werbach, 2014; Werbach & Hunter, 2012) argues that gamification is voluntary by definition. Yet, Mollick and Rothbard (2013) argue this voluntary consent is not necessarily given in gamification, as gamification is usually applied to a non-game related task (Deterding, Björk, Nacke, Dixon, & Lawley, 2013). Similarly Deterding (2016b) mentions several researchers (e.g., Conway, 2014; Deterding, 2012; Nolan & McBride, 2014; Smith, 2010; Werbach & Hunter, 2012) stating, that gamification, in its current form, may thwart voluntary participation and as such counteract an essential aspect of playing a game. Hence, they may lower or even undermine intrinsic interest towards both the core task and the gamification, and as such prevent them from interacting with the system (Deterding, 2011).

Thus, to contribute to this discussion, this master's thesis aims to explore the impact of providing the users with a choice of whether or not to interact with gamification. More specifically, it aims to answer the question whether voluntary consent influences the satisfaction of the need for autonomy and competence, and ultimately intrinsic motivation of the users. As such, this master's thesis contributes to the research on voluntary interaction with gamification by assessing choice as means of facilitating voluntary engagement with gamification. Additionally, it aims at putting researchers and practitioners on enquiry about how voluntary interaction with gamification is implemented when designing an intervention featuring choice. Further, this thesis provides first empirical data on voluntary consent through choice about gamification by assessing the influence of choice on intrinsic motivation and need satisfaction.

Theoretical Background

Gamification is a rather novel field of research which has been defined as the application of game elements to non-gaming contexts (Deterding et al., 2011). By attempting to transfer

the motivational benefits of games to non-gaming contexts, enhanced user engagement and motivation is anticipated (e.g., Deterding, 2011; Deterding et al., 2011; Mekler, Brühlmann, Opwis, & Tuch, 2013). Thus gamification aims to introduce gamefulness (McGonigal, 2011), the behavioural and experiential quality of games (Deterding et al., 2011), to a non-game related task. As such gamification seeks to provide the users with a more gameful experience (e.g., Deterding et al., 2011). Additionally, it may be employed to assist achieving specific goals of the implementing party, such as user participation (e.g., Eveleigh, Jennett, Lynn, & Cox, 2013) or enhanced performance, learning and improved health (e.g., Heeter, Magerko, Medler, & Lee, 2011). Consequently, gamification seeks to invoke interest and enjoyment in the users, intrinsically motivating them to perform the task (e.g., Deterding, 2011).

The $Self-DeterminationTheory$ (SDT; Deci & Ryan, 2002) is often used to explain the motivation behind gaming (e.g., Deterding, 2016b). SDT states that activities which satisfy the basic psychological needs for relatedness, competence and autonomy are actively sought out. Satisfaction of these needs results in intrinsic motivation towards an activity (Deci & Ryan, 2002).

Autonomy, the notion of perceiving an action as undertaken by one's own will, plays a key role in gamification (e.g., Deterding, 2016b). Not only does it pose a well-established construct of voluntary action (Deterding, 2016b), it also plays a fundamental role in the concept of SDT (Deci & Ryan, 2012). Basically, if an activity is perceived as autonomous it fuels intrinsic motivation. Additionally, autonomy classifies the range of motivational quality of possible motives to participate in a task when it is initially imposed upon the user (Deci & Ryan, 2012; Deterding, 2016b). Therefore, while intrinsically motivated tasks are perceived as inherently autonomous, sparking interest and enjoyment, extrinsically motivated activities are perceived as controlling and thus are often experienced as mandatory and bothersome (Deterding, 2016b).

Although there are exceptions, such as citizen science (e.g., Eveleigh et al., 2013), gamification is often implemented into activities which are usually not pursued voluntarily (Deterding, 2016b; Mollick & Rothbard, 2013), such as school (e.g., Dodero, Gennari, Melonio, & Torello, 2014; Watson et al., 2013) or work (e.g., Costa, Wehbe, Robb, & Nacke,

2013a). In contrast, regular games inherently rely on voluntary participation. Playing a game is defined as voluntary, autonomous, performed for its own sake (Deterding, 2016b; McGonigal, 2011; Rigby & Ryan, 2011). Hence, in Gagné and Deci's (2005) spectrum, games qualify as intrinsically motivated activities, satisfying the need for autonomy. Thus, playing a game constitutes an elected activity.

One of the key issues therefore is the combination of game elements – adapted from an inherently voluntary action – and a task, which is not necessarily undertaken autonomously. Mollick and Rothbard (2013) coined the term *Mandatory Fun*, to describe scenarios where autonomous meet mandatory actions. Since designers are in pursuit of a specific goal when implementing gamification (Kim, 2015), Mollick and Rothbard (2013) argue that gamification is imposed upon the users by said designers. In essence, Mandatory Fun means that the users do not have a choice whether or not to interact with the gamification. Arguably, this creates a paradox, in which an inherently autonomous action is extrinsically motivated (Mollick & Rothbard, 2013) and as such the designer may not assume that adding game elements will automatically satisfy the users' need for autonomy.

On the one hand, adding a game layer to such mandatory tasks may very well increase the users' positive affect towards the task, since gamification has been shown to positively influence engagement and enjoyment of an activity (Hamari, Koivisto, & Sarsa, 2014; Mollick & Rothbard, 2013). As a result, gamifying a task may lead to greater user-performance (e.g., Mekler et al., 2013) and motivation.

On the other hand, gamification, if experienced as controlling or forced, may thwart the feeling of autonomy, ultimately reducing intrinsic motivation towards the task (Deci et al., 1999). Hence, the result may be exactly the opposite (e.g., Heeter et al., 2011). For instance, Heeter et al. (2011) found that forced interaction with games may lead to undesired outcomes, such as negative affect, resulting in decreased task performance. Most detrimental to the desired effect, according to Heeter et al. (2011), is disliking the game, the genre or gaming in general. Hence, people being compelled to interact with a game they do not like, harbours the most negative influence. Similarly Costa, Wehbe, Robb, and Nacke (2013b) found their gamification to have a negative effect on the participation of a portion of the users. They were

bothered by the game and the underlying competition, leading them to refuse to partake in the core task altogether. Based on these observations one may argue, that the employees ditching the meetings altogether felt controlled (Deci & Ryan, 2012). As such they may have felt controlled by the system, compelled to partake through their peers' expectations rather than making an autonomous decision. Fitly, Hanus and Fox (2015) found the participants of their gamified university courses to show lower intrinsic motivation and worse exam results, compared to the regular courses. According to Mollick and Rothbard (2013) the decisive factor is the users' voluntary consent to interact with gamification. If they consent to gamification, including its rules and mechanics, they neither feel controlled nor compelled to partake. Accordingly, Domínguez et al. (2013) found gamification to be most effective, if the users were able to chose between a gamified and a traditional system. Further, Lessel, Altmeyer, Müller, Wolff, and Krüger (2016) found that users enjoyed constructing their own gamification of a displeasing task, choosing from a set of predefined game elements.

Yet arguably the caveat still is, that if the users do not consent, in scenarios where the core task is mandatory, such as school or work, they are to partake regardless. Thus, the aforementioned feelings of being controlled and compelled may be invoked as the users' choice whether to interact with the gamified system arguably is disregarded.

While choice does not equal autonomy but is closely related Ryan and Deci (2006), it is a factor facilitating the perception of doing a task by one's own will (Deci & Ryan, 2002). Conceivably, choice contributes to the desired perception of the task.

Fitly, Knaving and Björk (2013) suggest designing gamification as opt-in, in order to facilitate such experience of autonomy. Such an opt-in system allows the users to enable gamification while performing an activity, providing a choice of whether or not to engage with the game elements. Yet this option may hinder the effect intended by the designers, as some users may not be exposed to the game layer at all if they simply accept the default (Baron & Ritov, 1994).

An alternative approach would be an opt-out system as the users are confronted with the game elements before making a decision. However, to the author's knowledge, there is no prior work focussing specifically on opting in or out in the context of gamification and

conducting research on the matter. Merely suggestions have been made by a few authors (e.g., Knaving & Björk, 2013).

Aim of the Study

The aim of this master's thesis is to explore whether choice does influence the intrinsic motivation of the users of a gamified system. Specifically if the addition of choice does influence the observed and self-reported intrinsic motivation and need satisfaction. As research considering gamification and its motivational affordances is inconclusive and research on consenting to gamification is sparse, the first research question is:

RQ1: Does choice impact the users' intrinsic motivation?

Considering the lack of empirical work focussing on choice and more specifically its implementation, this master's thesis draws on research considering organ donations. Studies on organ donation consent have shown that a default presumed consent (opt-out) leads to a higher donation rate (consent; e.g., Johnson & Goldstein, 2003), as people often prefer accepting the default to making an effortful decision (Baron & Ritov, 1994). In contrast, a study conducted by Coppen, Friele, Marquet, and Gevers (2005) shows that the default has little to no impact on donation behaviour.

In consequence, an opt-in as well as an opt-out option have been included in this master's thesis to investigate which, if any, has a greater impact on the users' intrinsic motivation. Therefore, the second research question seeks to answer whether there is a difference between an opt-in and an opt-out approach. Specifically, if the superiority of an opt-out approach in organ donation behaviour (Johnson & Goldstein, 2003) is transferred to gamification.

RQ2: Does an opt-out system yield greater benefits than an opt-in system?

Method

The study was laid out as a 2 x 2 design. The independent variables were gamification from the beginning (gamified start) and whether or not the participants had a choice to enable

or disable the game elements (choice). Both independent variables had two levels each: yes and no. The dependant variables were self-reported intrinsic motivation, observed intrinsic motivation, need satisfaction, extrinsic motivation, number of tags and bonus tags.

Participants

One hundred sixty-six participants were recruited from the university's database, the university's student research platform, the department's newsletter, Reddit, and Facebook. Their age ranged from 18 to 78 ($M = 25.95$; $SD = 8.99$) and 123 were female and 4 chose not to specify their gender. Eighteen of the participants were recruited from various Facebook groups, 16 were recorded from Reddit, 106 came from the university's student research platform and the remaining 27 got the link from the department's newsletter or through the participant database. As an initial incentive to participate in this study, the potential participants were informed that there would be a raffle at the end of the survey. They could sign up for a giveaway of three gift cards for Amazon, each worth 100$. The choice to perform a raffle, rather than outright paying them for their participation was deliberate. Deci et al. (1999) found that such incentives are not detrimental to intrinsic motivation. They found task non-contingent rewards to not affect intrinsic motivation since they do not spark the feeling of being controlled within the users. Thus, participants from the student research platform were given two signatures, a mandatory part of their bachelor's degree, on top of the possibility to sign up for the giveaway. These forms of compensation are task non-contingent, as the participants' performance would not influence the reward in any way, since the giveaway's winner is chosen at random and the signatures are earned in any case (Deci et al., 1999).

Tag 'em

Tag 'em is an image annotation tool developed by Florian Brühlmann, who also created the first iteration used by Mekler et al. (2013) in their study on gamification. The participants are presented a series of images for each of which they are asked to provide as many tags as possible. The reasons for employing image tagging as apparatus for this study was twofold: First, image tagging has seen prior application in gamification research (e.g., Mekler et al., 2013; von Ahn & Dabbish, 2004; Wang & Yu, 2011) and may thus provide comparable

results. Second, image tagging did allow for the necessary manipulations to be implemented without interfering with the core task, thus avoiding possible confounding factors.

The default user interface featured three sections (Figure 1): The image to be tagged in the top section, a section showing the previously entered tags for the present image as well as an area to enter the tags.

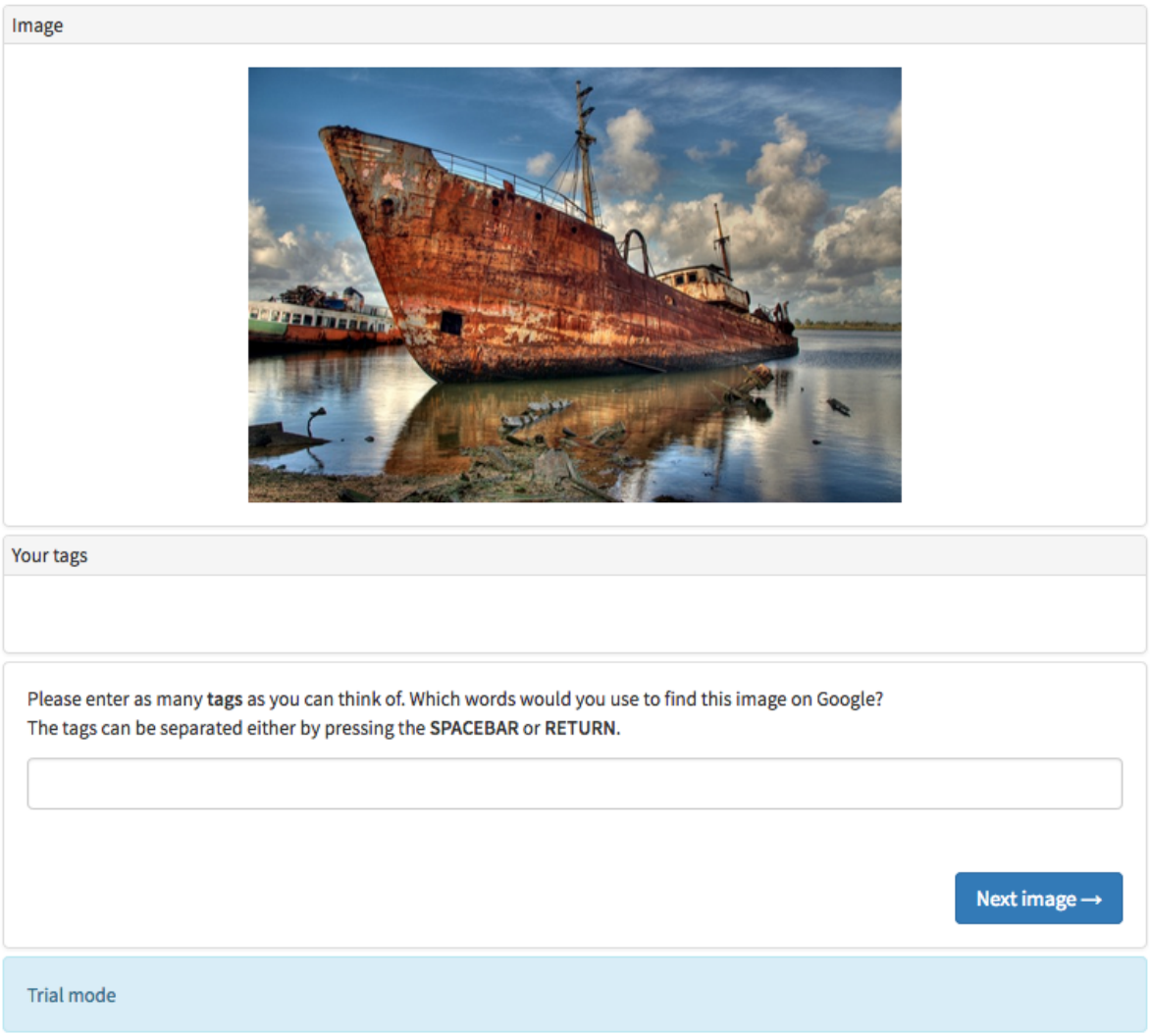

Figure 1. Default user interface of Tag 'em. The image to be tagged at the top, followed by the 'Your tags' section below, in which the submitted tags are displayed. Tags had to be typed into the field below this section. The blue bar at the bottom indicated a trial run.

Images. The images used for Tag 'em were taken from the NUS-Wide image database (Chua et al., 2009), originally used for machine learning. The contents of NUS-Wide were gathered by "randomly crawling" (Chua et al., 2009, p. 48:2) 300000 pictures on Flickr.com

and as such not cherry picked for a specific influential characteristic, avoiding the introduction of potential biases or confounding factors. Therefore this specific images set was chosen, as there was no intention of manipulating the mood of the study participants.

The database contained approximately 270000 images of which 103 were selected at random, of which 100 were used for the main task and the remaining three were used for the trial run. Since the NUS-Wide image database (Chua et al., 2009) was created in 2009, some of the images were no longer available. Thus the program for randomly picking the images from the set was run multiple times until the total of 103 images has been gathered.

Tags. A tag in this context describes a keyword for indexing the images, for example on a search engine. Possible tags ranged from colours (e.g., 'red'), locations (e.g., 'San Francisco') and interpretations (e.g., 'quiet') to objects (e.g., 'figurine') or beings (e.g., 'deer') depicted, to the aperture (e.g., 'f2.0') and model of the camera (e.g., 'D5') the image was taken with.

A number of tags for each image were contained within the NUS-Wide image database (Chua et al., 2009). These tags were created by the original uploader of the pictures. Chua et al. (2009), during creation of the database, removed tags that contained typos, or were deemed meaningless for image annotation, such as names or titles. For each image three of these predefined tags were taken and classified as bonus tags. The reasoning for these bonus tags was twofold: Firstly, since the tags classified as bonus tags were provided by the original uploader of the pictures, they arguably can be deemed to be well fitting tags for their respective image. By encouraging the participants to discover these tags, they are simultaneously urged to provide quality tags by thinking about which tags might be most suiting. Second, the board on which the bonus tags were unveiled upon a correct entry, was aimed at being associated with a word guessing game and thus introduce a bit more of an interesting challenge for the participants. For each of the 100 images of the main task, the first three tags provided by the NUS-Wide image database were chosen, as arguably the first three tags are the ones deemed most important by their creators. An exception to this rule was made if the first three tags either contained duplicates (e.g., 'bw' and 'b&w') or the tags were solely focussing on the technical aspects of the image (e.g., 'f2.0', 'Canon D5'). In these cases, the

next tags in line were chosen.

The number of bonus tags was set to three for two reasons. First, Mekler et al.'s (2013) study found that the participants provided an average of three tags per image. While the bonus tags were intended to evoke some more effort in the participants, they were not supposed to be overly time consuming. Second, it was decided against a single bonus tag for each image, as this might have rendered the active image as done too quickly and lead the participants to proceed to the next image.

Game elements. The gamified conditions of Tag 'em (Figure 2) employed a number of game elements. Whenever the participants submitted a tag, there was a pop-up on the right hand side of the screen informing them that they have gathered 100 points (Figure 3).

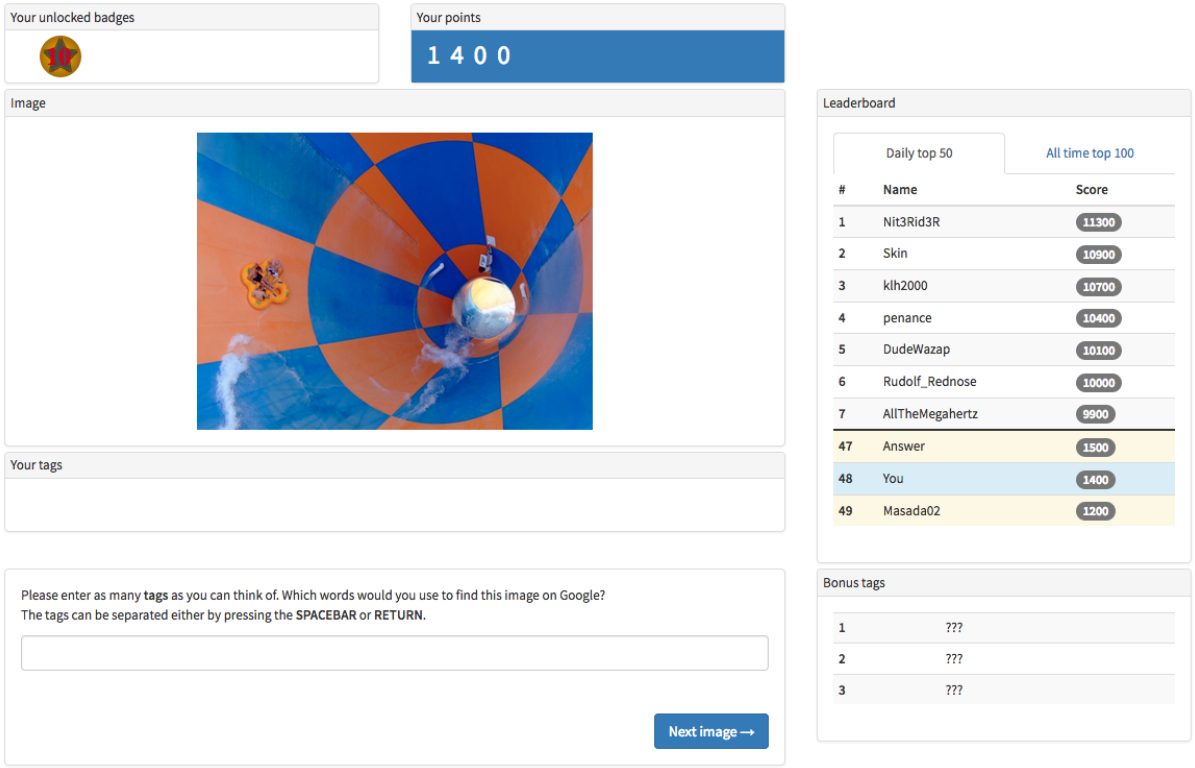

Figure 2. Gamified interface of Tag 'em. Badges, points, leaderboard and bonus tags are enabled.

They were able to see their momentary score at the scoreboard above the image (Figure 4). On the right hand side the participants saw a leaderboard (Figure 5), informing them how well they did amongst other participants. The leaderboard had two tabs, one displaying the 50 top ranked players of the day, the other the top 100 players of all time. The tabs were chosen

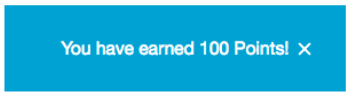

Figure 3. Pop-up appearing every time a tag is submitted, if gamification is enabled.

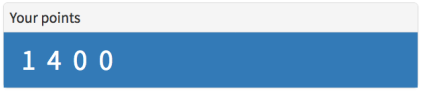

Figure 4. Score screen centred on top. Displayed the total score in the gamified conditions at any point in time.

so the participants could chose their competition. This action was taken to counteract possible demotivating effect, as cautioned by Costa et al. (2013b), due to high scores being unreachable without a lot of effort, while simultaneously avoiding reaching the top ranks being too easy. Hence, the tabs acted as a difficulty setting. All players on the leaderboard were – unbeknownst to study participants – fictional with preset scores to keep the challenge

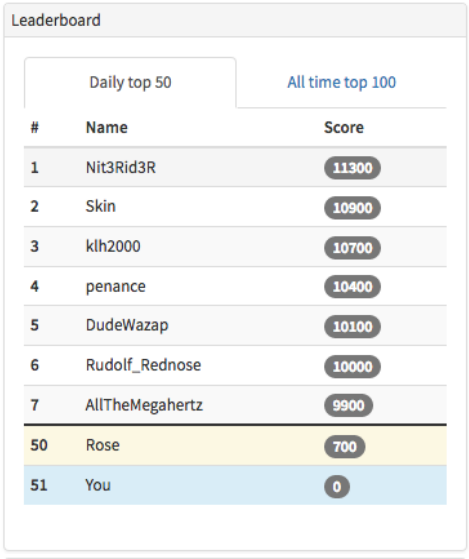

Figure 5. Leaderboard with two tabs. The left tab shows the participants amongst the top 50 daily players. The right tab indicates the rank amongst the 100 best players of all time. The blue bar displays the participant's current score and position. The yellow bar highlights the player one rank above (and below) the participant.

consistent. Furthermore, the participants would be rewarded with a bronze badge after 10 images, a silver badge after 50 images and a golden badge after 100 (Figure 6).

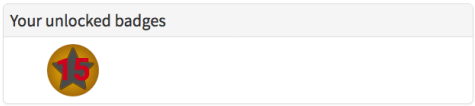

Figure 6. This element revealed a bronze badge after 10, a silver bagde after 50 and a gold badge after 100 completed images, in the gamified conditions.

These three game elements, points, leaderboard and badges, were chosen, because they are amongst the most common game elements employed in gamification (Zichermann & Cunningham, 2011). Underneath the leaderboard, an element labeled 'Bonus tags' could be found (Figure 7). The aforementioned three tags per image taken from the NUS-Wide image database (Chua et al., 2009) were used as these. If the participants entered one of these predefined tags, said tag would be unveiled on the board. Additionally, each of these three tags per image would reward the participant with 500 instead of 100 points as well as a differently coloured pop-up (Figure 8). Also, the bonus tags would be displayed in a different colour in the 'Your tags' section (Figure 9). The addition of this element was chosen, as further goal for each individual image, may arguably enhance the participants' motivation even further. Through this element, it was intended to encourage the participants to provide quality tags, consider the best possible tags. Hence, a rise in quality and a decrease in cheating (e.g., entering random letters to gain points) was anticipated.

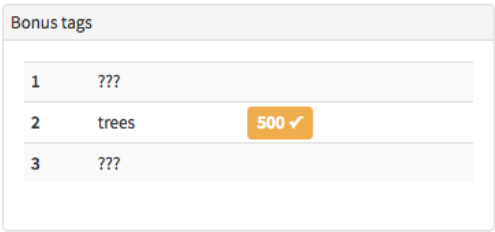

Figure 7. Bonus tags board. Upon correct entry, the bonus tags were revealed here. It indicated that there are three bonus tags to be discovered for each image.

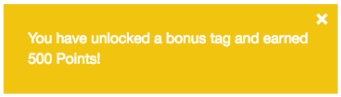

Figure 8. Pop-up informing the participants about their successful discovery of a bonus tag.

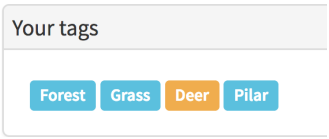

Figure 9. This section showed all the tags the participants had entered for the momentary active image. The blue boxes are regular tags and the yellow boxes are bonus tags.

Conditions

Based on whether or not the groups had gamification enabled when they started the main task, and whether they were able to chose between gamification on or off, four conditions were created (Table 1). The first condition was (1) gamification off, which was a version of Tag 'em with no game elements added and no possibility to enable any, thus this condition resembled the trial run and served as the control group.

(2) Forced Gamification featured all of the game elements (points, leaderboard, bonus tags and badges) but no way of disabling them. The participants were given the same information as the control group but were shown additional information considering the game elements and how they worked.

The third condition (3) was gamification opt-in, in which the participants were presented with the plain version of Tag 'em, but had a button in the upper right corner to enable the game elements. In this condition they received the same instruction as the control group until they completed the third image, which is when they were presented with instructions concerning the game elements. Additionally, they were also informed about the enable / disable game elements button, enabling them to switch between game and non-game modes whenever they pleased, which was visible from there on out. Additionally they were informed that if they did not wish to play the game, they had to finish the last image with gamification off so their scores would neither be recorded nor ranked amongst the other participants.

Table 1

Overview over the four experimental conditions.

Condition	Gamified start	Choice
Control (1)	No	No
Forced Gamification (2)	Yes	No
Opt-in (3)	No	Yes
Opt-out (4)	Yes	Yes

The final condition (4) gamification opt-out contained the same button and rules as condition (3), but the game elements were enabled by default. The participants received the same introduction before the first image as condition (2) and after three images, were made aware of the button and what to do if they did not wish to participate in the game.

Measurements

Intrinsic motivation. In order to assess the influence of the independent variables on intrinsic motivation, self-reported and observed intrinsic motivation were assessed. Self-reported intrinsic motivation was measured using the interest/enjoyment subscale (Cronbach's α = .94, ranging from .92 to .95) of the Intrinsic Motivation Inventory (IMI; Ryan, Mims, & Koestner, 1983) (7-point Likert scale from 1 = not at all true to 7 = very true). Observed intrinsic motivation was assessed through the number of images the participants completed extra to the required minimum of 15 images.

Need satisfaction. As satisfaction of the need for autonomy and need for competence are crucial to achieving intrinsic motivation (Deci & Ryan, 2002), measurements of these were included. Autonomy was assessed using the perceived choice subscale (Cronbach's α = .85, ranging from .81 to .88) of the IMI (Ryan et al., 1983). Competence was measured using the subscale perceived competence (Cronbach's α = .89, ranging from .87 to .92) of the same tool (7-point Likert scale from 1 = not at all true to 7 = very true).

Extrinisic motivation. The Gaming Motivation Scale's (GAMS; Lafrenière, Verner-Filion, & Vallerand, 2012) external regulation subscale (Cronbach's α = .83, ranging

from .78 to .87) was used in the three conditions employing gamification (2, 3, 4) to assess whether the participants experienced extrinsic motivation due to the game elements (7-point

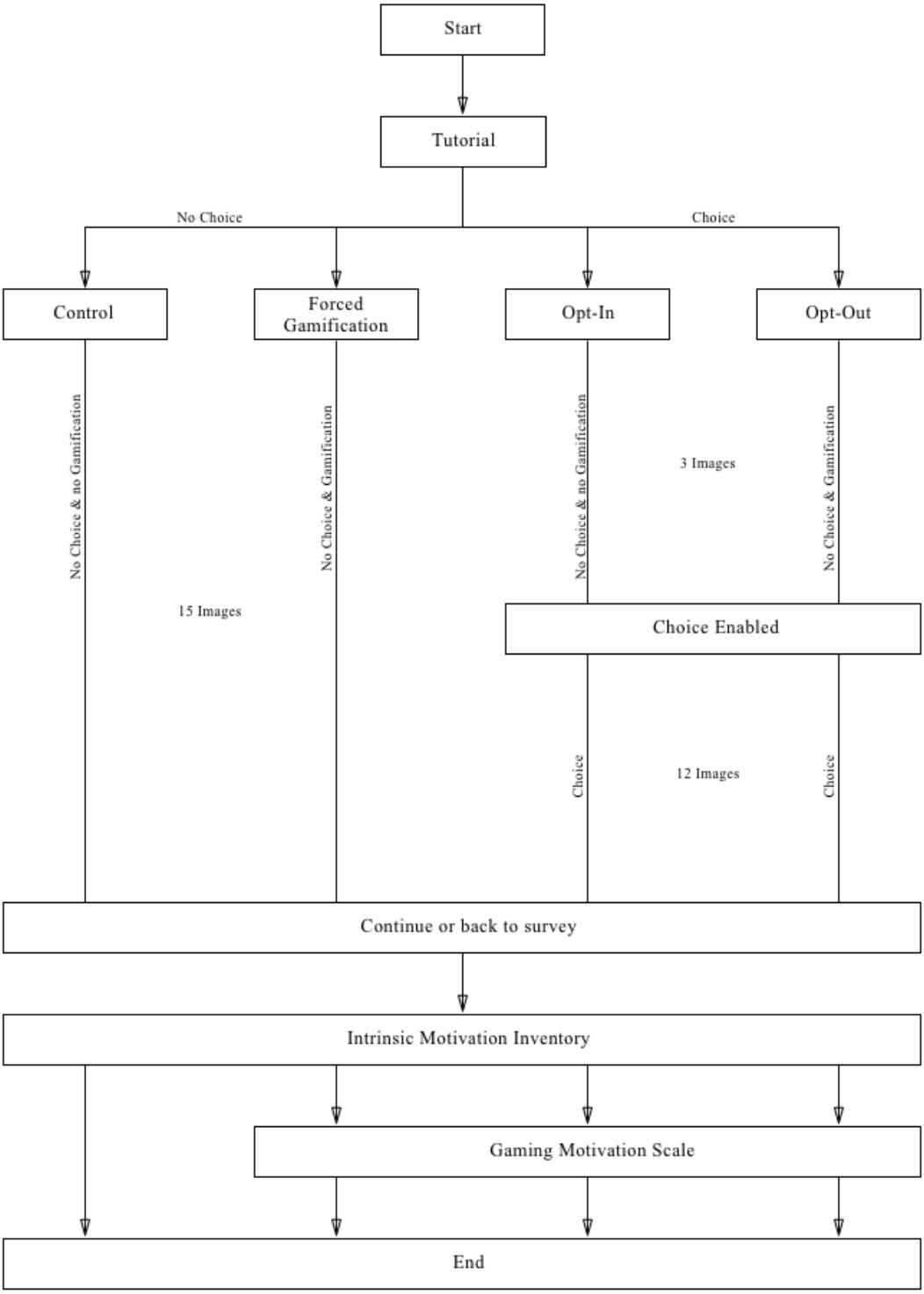

Figure 10. Study procedure for all conditions.

Likert scale from 1 = not at all true to 7 = very true). It has been argued, that game elements might extrinsically motivate their users (e.g., Kumar, 2013). As extrinsic motivation has been deemed detrimental to intrinsic motivation (e.g., Deci & Ryan, 2002), this measure was included to assess the extent of extrinsic motivation the participants experienced due to gamification. The questions of this scale were adapted to better fit Tag 'em (Table A1).

Number of tags and bonus tags. The amount of tags entered within the required minimum of 15 images, was measured for all conditions, as Mekler et al. (2013) found an effect of gamification on the number of tags. Additionally, the number of bonus tags entered in the gamified conditions, for these required images, was measured for each condition.

Demographics. The participants were asked about their gender, age, nationality, employment status and highest degree of education.

Open questions. The participants of conditions (2), (3) and (4) were given the opportunity to comment on each of the game elements of Tag 'em. Additionally, all participants were given a textfield in which they could put any further comments concerning the study.

Procedure

After reading the introductory text informing them about the study and its contents, the participants provided informed consent. If the participants gave their consent, they were redirected to the trial run of Tag 'em. It started with a slideshow explaining the basic user interface elements of Tag 'em followed by three images to be tagged. The trial run intended to familiarise the participants with Tag 'em and its controls. There were no active game elements in the tutorial, thus it resembled the control condition.

Next the participants were randomly assigned to one of the four conditions of the main task. In each condition a minimum of 15 images had to be annotated. Upon completion of the minimum required images, they were free to either continue, up to a maximum of 100 images, or return to the survey at any time. Once the participants chose to return to the survey they were asked to answer the interest/enjoyment, perceived choice, and perceived competence subscales of the IMI (Ryan et al., 1983). Participants of condition (2), (3) and (4) additionally had to fill in the modified version of the GAMS (Lafrenière et al., 2012) external regulation

subscale. Also, they were given the opportunity to comment on each of the employed game elements. Thereafter, they were presented with the demographic survey and an open question for general remarks. Upon completion they were given a link to an external survey, allowing them to enter the giveaway of three Amazon gift cards of USD 100$ each. An overview of the procedure can be found in Figure 10.

Results

Data cleaning. Participants who did not finish the study ($n = 103$), who provided the same answers to every question ($n = 3$), who were below 18 years of age ($n = 1$), or who experienced technical difficulties ($n = 2$) were excluded, resulting in the final sample size of 166 participants.

Table 2

Descriptive statistics. Means (and standard deviations) of all dependent variables by condition. Number of choices shows the total number of button activations for each condition.

Variable	Condition							
	Control (1) ($N = 40$)		Forced Gamif (2) ($N = 39$)		Opt-in (3) ($N = 47$)		Opt-out (4) ($N = 40$)	
Observed intrinsic motivation	4,43	(15.98)	9.90	(17.18)	8.45	(19.53)	5.57	(15.13)
Self-reported intrinsic motivation	3.97	(1.20)	3.90	(1.51)	3.97	(1.33)	3.94	(1.52)
Autonomy	5.33	(1.23)	5.23	(1.32)	5.32	(1.30)	5.54	(1.20)
Competence	4.05	(1.27)	4.24	(1.20)	3.98	(1.03)	4.13	(1.16)
Extrinsic motivation	-	-	3.69	(1.58)	3.36	(1.61)	3.52	(1.71)
Number of Tags	93.00	(40.65)	113.95	(62.75)	113.3	(51.30)	109.60	(64.10)
Number of bonus tags	-	-	11.5	(3.33)	10.89	(3.63)	8.4	(3.89)
Number of choices	-		-		57		55	

Choices. Of the 47 participants in the opt-in condition, 34 (72.34%) activated the enable / disable game elements button at least once. Twenty-four (51.06%) activated it exactly once to enable the game elements. Another five (10.64%) participants ultimately left gamification enabled while completing the task, after turning it on and off again. The opt-out condition saw fewer button activations with only 11 (27.5%) participants making use of the button in total. Yet only three (7.5%) participants chose to complete the task without gamification.

Effects of choice and gamification on intrinsic motivation and need satisfaction. For each dependant variable (self-reported intrinsic motivation, observed intrinsic motivation, perceived choice, perceived competence, number of tags entered) a two-way analysis of variance (ANOVA) was conducted. The two independent variables for these ANOVAs were whether gamification was enabled from the beginning of the task (gamified start), and whether or not they were allowed to chose between a plain and a gamified system (choice). Both independent variables had two levels (True, False). To assess the difference in extrinsic motivation, and number of bonus tags for the first 15 images within the gamified conditions, one-way ANOVAs were calculated. A confidence interval of 95% and an alpha level of $\alpha = 0.5$ was used for all ANOVAs. To ensure homogeneity of variance, all ANOVAs were calculated using HC3 correction. The means and standard deviations for all dependant variables by condition can be found in Table 2.

Self-reported intrinsic motivation. There was no significant effect of either gamified start, $F(1,162) = 0.05$, $p = .83$, $\eta^2 = 0.00$; or choice $F(1,162) = 0.00$, $p = .95$, $\eta^2 = 0.00$. The interaction between the factors was not significant as well $F(1,162) = 0.01$, $p = .94$, $\eta^2 = 0.00$. Thus, the participants reported average intrinsic motivation, regardless of the condition they were assigned to (Figure 11).

Observed intrinsic motivation. Neither were there any significant effects on the observed intrinsic motivation, neither for choice, $F(1,162) = 0.00$, $p = .98$, $\eta^2 = 0.00$; nor for gamified start, $F(1,162) = 0.27$, $p = .60$, $\eta^2 = 0.00$. Also, there was no significant interaction, $F(1,162) = 2.34$, $p = .13$, $\eta^2 = 0.01$. Hence, these results are in line with the self-reported intrinsic motivation scores (Figure 12).

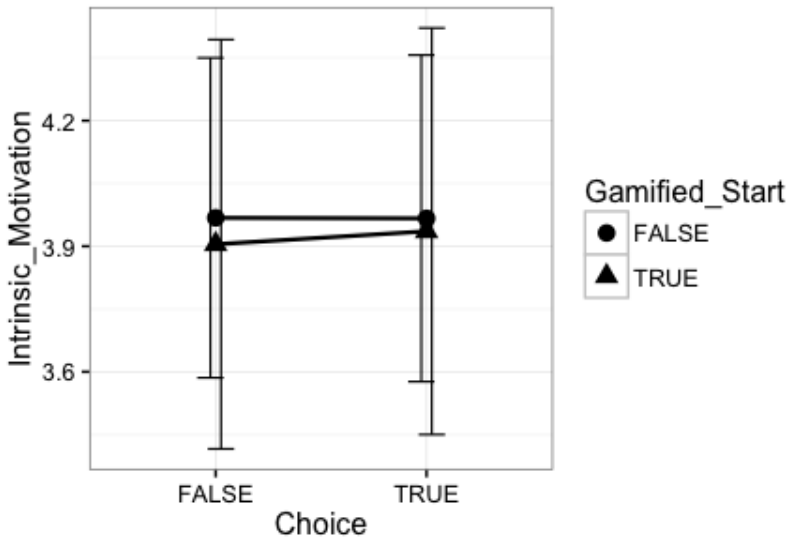

Figure 11. Differences in self-reported intrinsic motivation for choice and gamified start.

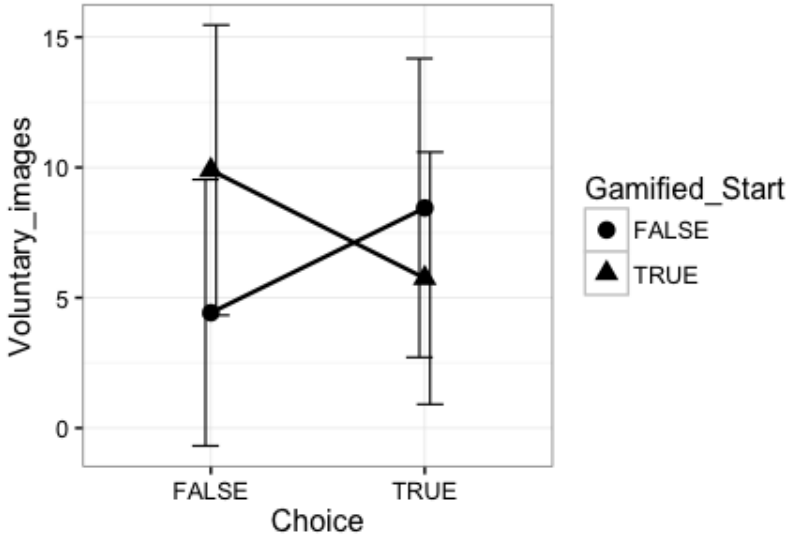

Figure 12. Differences in observed intrinsic motivation, measured in the number of images tagged extra to the required minimum.

Autonomy. No significant effect of choice, $F(1,162) = 0.60$, $p = .44$, $\eta^2 = 0.00$; gamified start, $F(1,162) = 0.11$, $p = .74$, $\eta^2 = 0.00$; or interaction effect, $F(1,162) = 0.67$, $p = .42$, $\eta^2 = 0.00$ on experienced autonomy emerged. As such, regardless of the condition, all participants showed high autonomy scores (Figure 13).

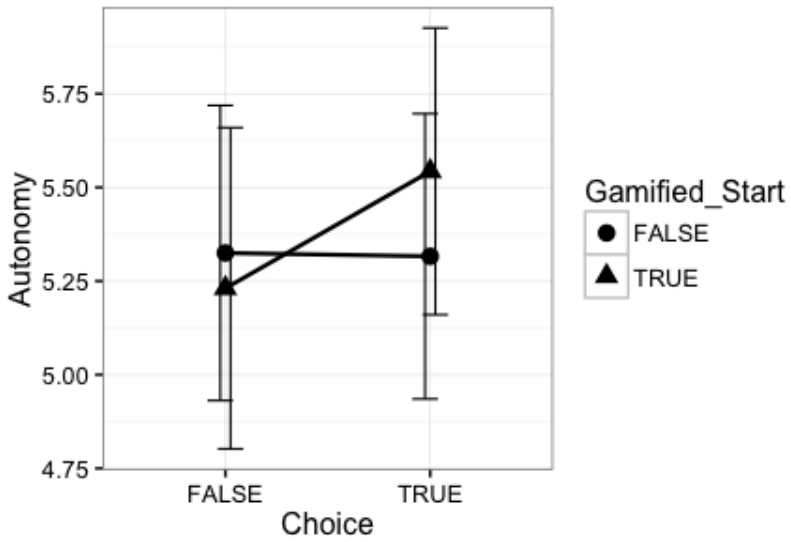

Figure 13. Differences in autonomy for choice and gamified start.

Competence. No significant influence of choice on perceived competence could be determined, $F(1,162) = 0.27$, $p = .60$, $\eta^2 = 0.00$. Also, gamified start did not have an effect on competence, $F(1,162) = 0.93$, $p = .34$, $\eta^2 = 0.01$. Additionally, there was no significant interaction between the factors $F(1,162) = 0.01$, $p = .91$, $\eta^2 = 0.00$. Nevertheless, the perceived competence ratings were predominantly above average (Figure 14).

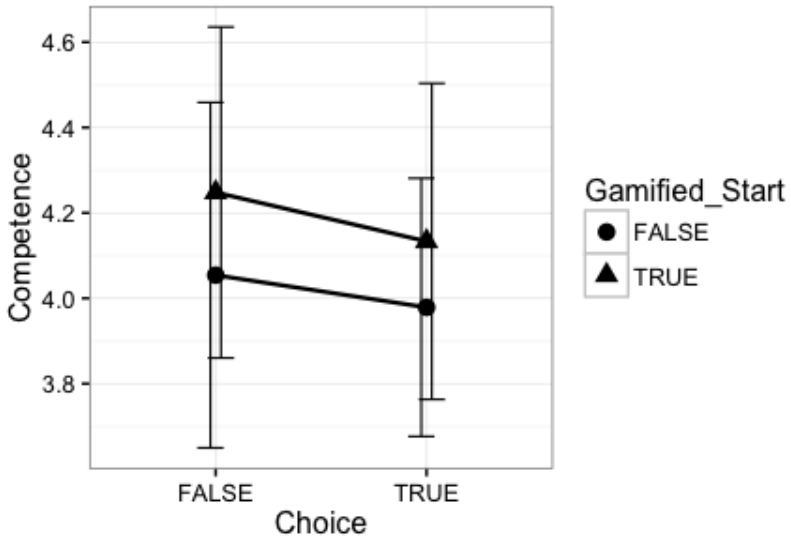

Figure 14. Differences in perceived competence for choice and gamified start.

Extrinsic motivation. To check for extrinsic motivation due to the game elements, a one-way ANOVA was calculated with condition (2,3,4) as independent variable and the GAMS external regulation (Lafrenière et al., 2012) score as dependant variable. There was no significant difference between the gamified conditions $F(1,162) = 0.43$, $p = .65$, $\eta^2 = 0.01$. Throughout all conditions, the extrinsic motivation was reported as being rather low (Figure 15).

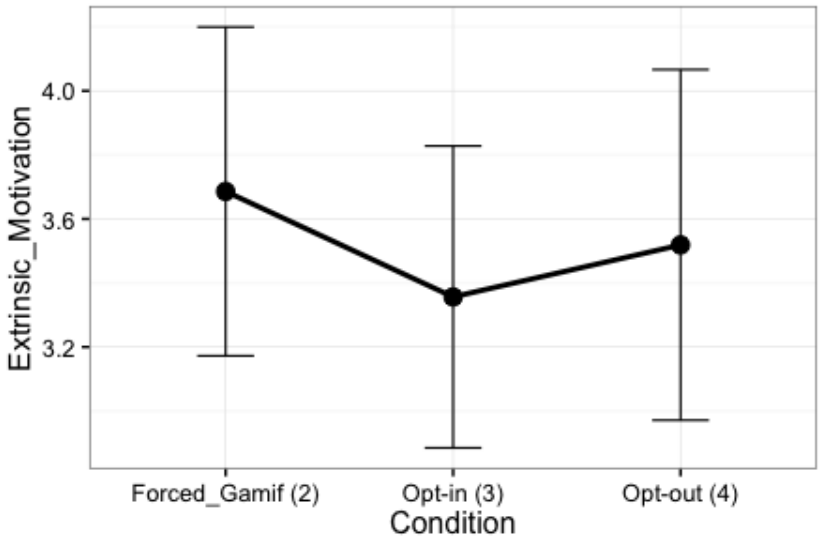

Figure 15. Differences in extrinsic motivation for all gamified conditions.

Number of tags and bonus tags. The number of tags entered during the first 15 images did not differ significantly for choice, $F(1,162) = 0.87$, $p = .35$, $\eta^2 = 0.01$; or gamified start, $F(1,162) = 1.00$, $p = .32$, $\eta^2 = 0.01$. The interaction was non-significant as well, $F(1,162) = 2.06$, $p = .15$, $\eta^2 = 0.01$. Overall, the participants provided comparable amounts of tags throughout all conditions (Figure 16). Yet, a significant difference in the number of bonus tags emerged between the gamified conditions, $F(1,115) = 7.84$, $p = .00$, $\eta^2 = 0.12$ (Figure 17).

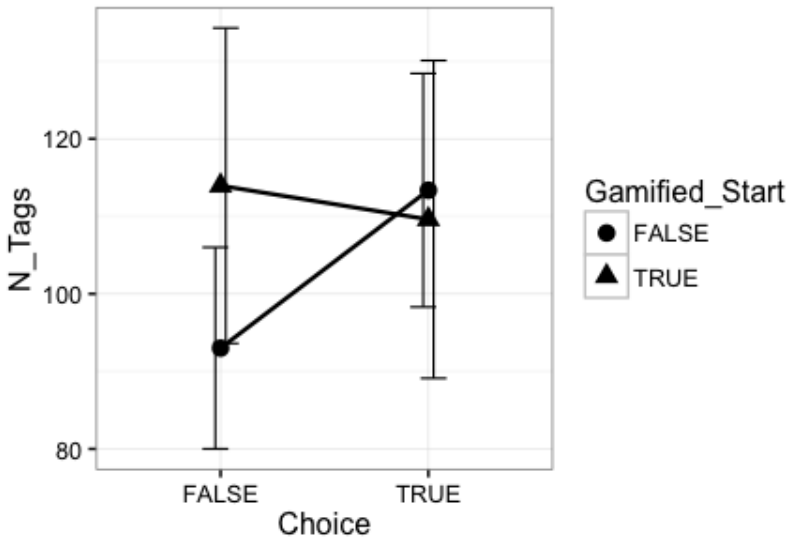

Figure 16. Differences in the number of tags entered during the required minimum amount of images.

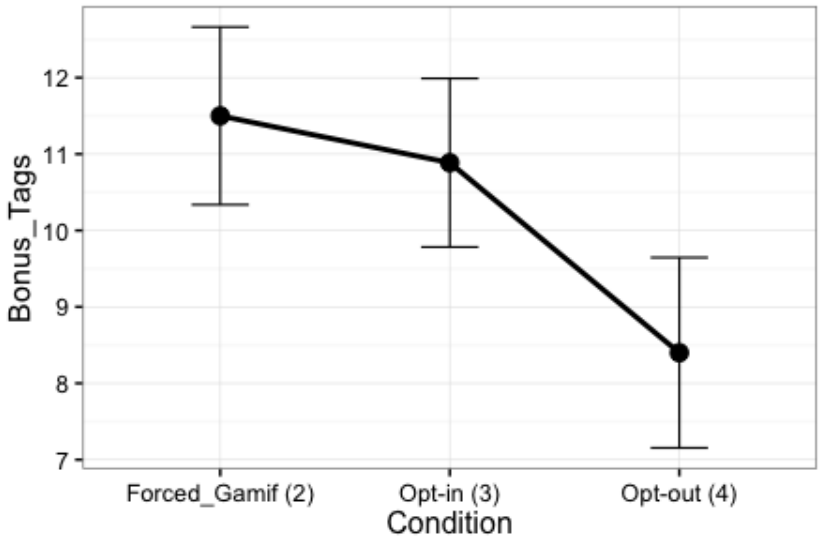

Figure 17. Differences in the number of bonus tags discovered for the gamified conditions.

Discussion

Choice and starting with a gamified system did not yield significant effects on intrinsic motivation and need satisfaction. Neither the observed nor the self-reported intrinsic motivation scores did show any impact due to having a choice about interacting with gamification. Therefore, the first research question, RQ1: *Does choice impact the users'*

intrinsic motivation?, cannot, at least in the context of this study, be confirmed.

Nonetheless, the participants, when given the opportunity, made a choice concerning gamification. Most of the participants of the opt-in group (72.34%), who started with no gamification, enabled it. The majority of the opt-out group, which started with gamification, left it enabled (92.5%), with only 27.5% making use of the button at all, and a mere 7.5% opting-out. Thus, they either made a choice to leave the game elements enabled, or they simply accepted the default (Baron & Ritov, 1994). Hence, arguably most participants (82.52%) chose to interact with the game elements in one way or another. Yet, as the differences in extrinsic motivation between the groups, deemed detrimental to intrinsic motivation and autonomy (Deci & Ryan, 2012; Deterding, 2016b), were non-significant, they did not seem to feel any more or less controlled than the other groups, having no choice or no gamification at all. Fitly, the participants entered a comparable number of tags across all conditions.

Hence, as there were no differences in intrinsic and extrinsic motivation, and need satisfaction between the opt-in and the opt out groups, the construct of opting-in, as suggested by Knaving and Björk (2013), could not be observed to be the right approach in the context of the current study. Neither did opt-out, as derived from studies on organ donations (Johnson & Goldstein, 2003). If the studies on organ donations are considered, the findings seem to be more in line with Coppen et al. (2005), who found little to no difference between an opt-in and an opt-out approach. Contradictingly, the opt-out group made less choices and went with the default more often. Therefore, the second research question RQ2: *Does an opt − out system yield greater benefits than an opt − in system*?, cannot conclusively be answered.

Considering choice being a construct closely related to autonomy (Ryan & Deci, 2006), on the one hand, providing the participants with the opportunity to make a choice about gamification, did not increase perceived autonomy. On the other hand, the overall perceived autonomy ratings were high in the first place. Due to the high ratings across all groups, these findings suggest that while choice did not suffice to increase high autonomy ratings even further, neither a gamified system nor the availability of choice did seem to negatively impact the perceived autonomy of the participants. Perhaps, the fact that the study was fully

non-obligatory (i.e. the participants had a choice about partaking in the first place), compared to scenarios of mandatory fun (Mollick & Rothbard, 2013, e.g., gamified work or school contexts), contributed to these high autonomy ratings across all groups (Ryan & Deci, 2006). Hence, these autonomy ratings may be attributed to participating in the study in the first place, rather than an aspect of it (i.e. gamification).

While unlikely, considering these high autonomy scores, another possible explanation is the fact that certain game elements, such as leaderboards and points, may be used as performance indicators (Deterding, 2016a). Such performance indicators may thwart the feeling of autonomy, as they constantly remind the participants of their performance and the expectations of the system (Deci & Ryan, 2012). Although the high autonomy ratings did not seem to indicate any such thwarting, possible increases in perceived autonomy may have been obstructed by this circumstance. Then as well, possible increases in perceived competence, which was predominantly above average for all conditions, may have been hindered by receiving feedback after every action, for example, when searching for bonus tags in vain. Therefore, these possible hindrances perhaps inhibited further satisfaction of the needs for autonomy and competence, obstructing an increase in intrinsic motivation (Deci & Ryan, 2002). The high autonomy ratings furthermore, query the notion of gamification exploiting or manipulating users, as suggested by Bogost (2011) and Kim (2015). According to the rather low extrinsic motivation ratings, as well as the high autonomy scores, the participants did not indicate that they felt controlled, compelled or exploited (Deterding, 2016b), regardless of gamification or choice.

On the subject of being compelled to interact with gamification, the findings of the current study contradict Heeter et al.'s (2011) notion of forced interaction with games leading to undesired outcomes. The results of the current study showed no difference in intrinsic motivation, need satisfaction or extrinsic motivation, between the group that had to interact with the game elements and the ones that did not or had a choice about doing so. Thus, the current study did not indicate a negative influence of being forced to interact with gamification. Heeter et al. (2011) found the effects of forced interaction were most detrimental, if the participants did not like the kind of game they were exposed to. Since there

was no significant difference in self-reported intrinsic motivation between the groups, which more importantly was about average for all conditions, arguably the game elements employed by the current study were at least not experienced as bothersome, perhaps even suited the task well. This may partially be due to the age of the participants. As Yee, Ducheneaut, Shiao, and Nelson (2012) found, younger players are more likely to enjoy competition. Considering the participants' mean age of 26 years, the fake leaderboard may not have had detrimental effects on enjoyment, as it may have had on people over 30 years of age (Yee et al., 2012).

Further, the notion of consenting to gamification as a necessity to avert feeling compelled, and as such avoiding mandatory fun (Mollick & Rothbard, 2013), could not be conclusively observed in the current study, as giving the participants a choice, did neither seem to influence autonomy, intrinsic motivation nor extrinsic motivation. Yet since most participants (82.52%), when given the opportunity, chose to use the game elements, it may be assumed that the participants did consent to gamification. But since the forced gamification condition showed comparable results, this consent seems at the very least, independent of the actual ability to hide the game elements by clicking a button.

A possible explanation for these contrasting results, may be that the task of the current study, was not as mandatory as a work or school scenario focussed on by Mollick and Rothbard (2013), and Hanus and Fox (2015) since, after all the study was conducted online and the participants were free to quit at any time. Moreover, perhaps the current study did not invoke the feeling of being compelled, since it took place in a much shorter time (i.e. roughly 35 minutes), compared to a work or school scenario. Especially in comparison to Hanus and Fox (2015), who gamified a university course for a full semester. Additionally, the current study was conducted online, by participants who were made aware of its limited duration, rather than by applying gamification to an everyday, mandatory undertaking, over an extended period of time. As such, the duration of a task may be another facet in perceiving a task as mandatory.

In conclusion, while this study could not show an influence of choice about gamification on intrinsic motivation and need satisfaction, it does not imply, that choice and consent are omittable in the context of gamification. The results merely suggest, that choice did not harm

intrinsic motivation and need satisfaction, in the context of a non-obligatory online study. Furthermore, these results indicate, that perhaps choice is more important in mandatory settings, as focussed on by Mollick and Rothbard (2013) and Hanus and Fox (2015), and does not weigh in as much in non-obligatory contexts, such as this study. Therefore when gamifying tasks, which are mandatory by nature, consent and choice should still be considered as suggested by previous studies (e.g., Mollick & Rothbard, 2013). Conclusively answering whether choice about gamification, and specifically opt-in or opt-out, does influence intrinsic motivation and need satisfaction, requires further research on the subject.

Limitations and future research

There is a number of limitations to be noted in this study. First, as the low extrinsic motivation scores and high autonomy scores suggest, this study did not seem to be perceived as mandatory or controlling, as it focussed on mandatory gamification, rather than a mandatory task. Hence, possible benefits of providing the participants with a choice to counteract feeling controlled could not be measured. Therefore, future studies should ensure a more mandatory setting as was the case in other studies (e.g., Hanus & Fox, 2015; Mollick & Rothbard, 2013) . For example, the participants may be informed, that in order to complete the task, they have to reach a certain rank on the leaderboard or gather a minimum amount of points. Another possible implementation could be punishing the participants for mistakes, for example by subtracting points. Also, conducting a similar study over an extended period of time, may influence the perception of mandatoriness as well as provide further insights of the role of time in perceiving activities as mandatory or autonomous. A longitudinal study might also allow to measure novelty effects often attributed to gamification (e.g., Cechanowicz, Gutwin, Brownell, & Goodfellow, 2013; Koivisto & Hamari, 2014) and their influence on perception of mandatoriness.

Further, choice was implemented in this study as an all or nothing approach. Either the participants had all game elements enabled or none. Future work should incorporate an approach similar to Lessel et al. (2016), by providing the participants a choice about individual game elements. Thus, they are given even more choice about their experience, compared to

the current study, which may further enhance the perceived autonomy (Deci & Ryan, 2002).

Such an approach would also allow to test individual game elements, similar to Mekler et al. (2013), specifically the bonus tag system, which to the author's knowledge, no study has yet employed in this form. Hence, there might be effects due this system, remaining in the dark in the current study, to be discovered.

Moreover, since several authors state that different demographic factors, such as age and gender, influence the perception of different game elements (e.g., Dodero et al., 2014; Koivisto & Hamari, 2014; Li et al., 2014; Vella, Johnson, & Hides, 2013), more diverse choice may allow to more specifically cater to individual users.

The current implementation of choice did allow the participants, at any point during the task, to retract the previously made decision. Hence, the choice may not have been perceived as important. Future research should experiment with attributing greater importance to choice, such as making decisions final, to assess whether the ability to make a choice gains more influence if it cannot be retracted at will. This might also allow to gain insights on the influence of other constructs, such as cognitive dissonance (Festinger, Irle, & Möntmann, 1978), on intrinsic and extrinsic motivation, and need satisfaction.

Conclusion

Providing the users of a gamified system with a choice about interacting with the game elements did not have an effect on either the perceived or observed intrinsic motivation compared to being forced to interact with and no interaction with the game elements at all. Neither could any differences in need satisfaction or extrinsic motivation be observed. Yet the majority of the participants, who had a choice did make use of gamification. Hence, these findings suggest, that at the very least, allowing the users to enable or disable gamification, in such a non-obligatory context, may not have the same effect on the users' autonomy and intrinsic motivation, suggested by work on gamification in mandatory settings. And lastly, that allowing the users to make a choice does not have detrimental effects on intrinsic motivation and need satisfaction.

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Appendix

Adapted items of the Gaming Motivation Scale's (Lafrenière et al., 2012) external regulation subscale.

Table A1

Original and adapted GAMS (Lafrenière et al., 2012) external regulation subscale. The first item has been split into two in order to better assess individual game elements.

Original	Reformulated
To acquire powerful and rare items (e.g., armors, weapons) and virtual currency (e.g., gold pieces, gems) or to unlock hidden/restricted elements of the game (e.g., new characters, equipment, maps).	To acquire as many points as possible. To unlock the special tags for each image.
For the prestige of being a good player	For the prestige of being a good participant.
To gain in-game awards and trophies or character/avatar's levels and experiences points.	To set a highscore.