During the past couple of years, the use of game design for economic purposes in games (Hamari and Lehdonvirta 2010; Hamari and Järvinen 2011) as well as in non-game contexts (Reeves and Reed 2009; Deterding et al. 2011; McConigal 2011; Zichermann and Cunningham 2011; Huotari and Hamari 2012) has rapidly gained a substantial amount of traction among scholars and practitioners. This development of affording gameful experiences or using design patterns in games has been dubbed gamification. Following the successes of social networking services (Facebook), games (Angry Birds), and location-based services (Foursquare), marketers in particular have started to apply gamification in attempts to affect user behavior. Gamification has already been applied in several areas, such as for persuading people toward greener consumption (EcoIsland), building loyalty toward television channels (GetGlue), taking care of one’s health (Fitocracy), and even for gamifying the tracking of one’s aspirations in life (Mindbloom).

So far, gamification has been discussed mainly in the area of game studies, and its positioning within other scientific domains still remains unclear, hindering the identification of potential avenues for further inquiry. In the economic context, gamification has been defined as a process of enhancing systems by affording gameful experiences in order to support the overall value creation (Huotari and Hamari 2012). This definition is rooted in the service marketing field. In this chapter, however, we dig deeper into the economics of gamification by illustrating how gamification links to other existing models and concepts in economics.

We start with a brief description of the theories that neoclassical economists use to model decision making and give examples on how some gamified design patterns relate to these models. After this, we turn to both potential and existing economic applications of gamification. Then, we look at the economic reasons why and when one might find it useful to push decision makers to a new direction using gamification. After all, economics 101 teaches us that free markets should yield efficient outcomes without any pushing. Hence, it seems that there might be very little room for gamification. However, we argue that when some of the assumptions that deliver efficiency fail, gamification can be a potential tool for remediating these market failures.

The section on behavioral economics considers what happens when agents are less sophisticated. By this, we mean situations where they do not behave according to the axioms outlined in the section on neoclassical economics. Usually, this means that the agents are not able to use optimally all information...
that is available to them or make systematic logical errors when choosing between different available options. We illustrate with examples how gamification often plays with these systematic biases.

We then look at gamification from the point of view of marketing. By using Foursquare as an example, we examine gamification through the perspective of transactional marketing theory, relationship marketing, service marketing, and experiential marketing. Lastly, at the end of this chapter we discuss the added value that gamification brings to economics.

A Brief Look at the Microeconomics of Gamification

Essentially, it can be said that the goal of practically all gamification is to affect the decision making of a given target group so that at least some of the users will take actions they would not have otherwise taken. Examples range from more ecological consumption (Ecoland) and healthier lifestyles (Fitocracy) to divulging location information (Foursquare) or professional activities (LinkedIn) or just simply purchasing more of a given good (loyalty cards).

In this section, we explore the economic reasons why and when it might be useful to push decision makers to a new direction using gamification. We first give a brief overview of neoclassical theory of economic choice and then relate it to some gamified design patterns.

A Sampler of Some Basic Economic Mechanisms That Make Gamification Tick

Decision Theory and Gamification

Decision theory is a subfield of economics that tries to build mathematical models of economic decision making. The goal is to produce a general theory that is able to take the whims and tastes as inputs and generate predictions of aggregate economic behavior. A decision theorist is interested in the reasons behind the decisions only as far as they affect the general rules that agents use to make these decisions.

Consequently, these models are very different from explanations offered in psychology and related fields that try to describe the cognitive processes behind decision making. The strength of economic theory is that it offers strong and testable predictions on what people will choose given their previous behavior, while its relative weakness is that it avoids taking a strong stand on why people choose what they choose.

Choice under Certainty

Any modern treatment of choice theory starts by assuming that people are able to make pairwise comparisons between any possible bundles of goods or services. If this is the case, people’s preferences are said to be complete. Furthermore, it is also often assumed that these decisions do not contradict one another. More specifically, the most basic model of decision theory assumes that if you like Twitter more than Foursquare and Foursquare more than Farmville, then you must like Twitter more than Farmville. This is called transitivity. Perhaps surprisingly, when the number of possible choice bundles is finite, completeness and transitivity alone are enough to guarantee that the choices of an agent can be modeled as if she was maximizing a real-valued function that is defined on the space of all possible choice bundles. This is the famous utility function that is
the workhorse of most theories of economic demand under certainty.

When outcomes are certain, this model predicts that the only way gamification can affect choices is to affect the relative ordering of different choice bundles. In other words, in this basic setup, gamified features of a service always either add value to the action that the designer of the service would like the user to take or make the most preferred competing actions less appealing. For instance, assume a Four-square situation where you had just been ousted as the mayor of your local Starbucks. If retaining mayorship was valuable to you, then visiting that same Starbucks would have now become relatively more appealing compared to visiting other cafés. Gamifying café visits may thus lead you to go to your local Starbucks more than the other nearby cafés and thus affect the relative ordering of your choice bundles.

**Choice under Uncertainty**

Almost all of our choices contain uncertainty. For instance, if I want to go to the outside ice cream bar, there is always the risk that it will start to rain or that they are out of my favorite flavor, cappuccino-chocolate. If this is the case, I might prefer staying inside. However, before I go downstairs, I am uncertain of the outcome of my outing. In principle, this is not a problem for the standard utility theory—as long as we perceive choice bundles to include gambles, the utility representation still holds. However, often it would be convenient to have the choices to correspond to a model where agents maximize some expectation over utilities derived from the outcomes of the gambles. To illustrate, suppose that the sky is blue and that the probability of rain is zero and thus the question is only if they have cappuccino-chocolate (henceforth c-c). Assume further that I think the probability of them being out of c-c is 0.3. Then, for many applied models it would be convenient if there was a utility index \( u \) such that I go for ice cream if and only if

\[
u(\text{stay inside}) \leq E[u(\text{go for ice cream})] = 0.3u(\text{out of c-c}) + 0.7u(\text{serving c-c}).
\]

In other words, my choices correspond to maximizing the expected utility I attain from the different lotteries that are available to me. The utility index here is again just a modeling tool that is not assumed to be anything that the people making choices use but only a tool that leads to analytically tractable results. The question is when are people’s choices “regular” enough to be compatible with such a representation? If such a representation exists, it is clear from the previous example that if the probability distribution over outcomes in two gambles is similar; also the expected utility from those two gambles is almost the same. The formal version of the assumption which guarantees that similar gambles are ranked similarly is called continuity.

In addition to completeness, transitivity, and continuity only one more axiom is needed to guarantee that choices can be modeled as coming from expected utility maximization. This axiom is commonly known as the independence axiom, as it states that my ordering of gambles should not change if I add a given new lottery to any pair of existing lotteries.

More specifically, if above I preferred going for an ice cream despite the risk of them being out of c-c, I should still prefer a lottery where my neighbor takes me for an ice cream with 0.5 chance and I go alone with 0.5 chance to one where I stay home with 0.5 chance and my neighbor takes me out with 0.5 chance. Note how the scenario of my neighbor taking me out got added to both pre-existing scenarios with
The expected utility is extremely convenient when combined with situations where money is a good substitute to all uncertain outcomes. This allows discussion about the attitude the decision maker has toward risk. Consider facing a lottery that yields $50 with certainty versus one that yields $0 with probability 0.5 and $100 with probability 0.5. Both have the same expectation, but the second is obviously more risky than the first. In general, a person who is willing to pay some money to get the first lottery rather than the second one is called risk-averse, and a person who is willing to pay to get the second rather than the first is usually called risk-loving. A person who thinks the two are equally good is called risk-neutral. The attitudes toward risk translate directly to different forms of curvature of the utility function. For the range where the preferences are risk-averse, the graph of the function curves down, and for the risk-loving preferences it curves up. For risk-neutral preferences, the graph is a line. A possible utility function with risk-loving, risk-neutral, and risk-averse regions is presented in figure 5.1.

A fairly general empirical observation is that people tend to be risk-loving when the expectation of the lottery is relatively small compared to their current wealth. For instance, the expected value of a common lottery ticket is usually less than the price of the ticket. Nevertheless, lotteries are highly popular. However, when the expectation of the gamble becomes large relative to the person’s wealth, people become increasingly risk-averse. For instance, the premium of a homeowner’s insurance is usually substantially more than the expected value of the damages (since most of the time people have zero claims), and still most people tend to buy insurance contracts.

These changing attitudes toward risk link directly to the design of gamification. The fact that most people find small gambles entertaining has also been used outside casinos and national lotteries. For instance, the Disneyland attraction “Star Tours—The Adventures Continue” features a randomly chosen sequence of flights. A guest entering the attraction cannot know which one of the possible fifty-four ride experiences she will encounter.² If people were uniformly risk-averse, then this layer of randomization would make the ride strictly inferior to one where the outcome of the ride was known beforehand. Conversely, recommendation services like Foursquare recognize the inherent risk-aversion that people often exhibit when choosing restaurants. For them, it is beneficial that new places get reviewed fast, as otherwise all of the risk-averse restaurant goers will just flock to the places with the largest number of positive reviews and avoid the risk of getting a bad meal in a new place. Thus, Foursquare offers rewards to the first patron of a new restaurant, and of course it is easier to become the mayor of a newly opened establishment than of the most popular café around the corner.

These two examples highlight how attitudes toward risk play a strong role in how gamification should be designed. First, one must try to figure out customers’ preferences: whether the target group’s
Figure 5.1

The figure presents an example of possible preferences over monetary gambles. The monetary value of outcomes is presented on the x axis, while the utility from any given outcome is given on the y axis. The preferences in the figure show first a region of risk-loving preferences between gambles with outcomes between points A and B. Then the preferences change to risk-neutral ones between gambles with outcomes in the interval from B to C. Finally, the interval from C to D shows risk-averse behavior. We have illustrated this change in preferences by drawing the utility the person obtains from a 50-50 gamble between points A and B, B and C, and C and D, respectively, and then compared this to the utility the person obtains from getting the expectation of the gamble with certainty. For instance, note that in the risk-averse region, the point \( u(0.5C + 0.5D) \), that is, the utility obtained from getting the expectation of the gamble with certainty, is above the point \( 0.5u(C) + 0.5u(D) \), which is the expectation of the utility that the person gets from the gamble. Thus, in this region the person prefers the expectation with certainty over the gamble that has the same monetary expectation. Analogous reasoning shows that in the region between points A and B, the person prefers gambles over certain monetary rewards, and in the region between B and C, the person does not care whether to gamble or to take the money with certainty.
available actions lie on the risk-averse part of the utility function or the risk-loving part. After this, it is easy to decipher whether adding risk to the outcomes of the available actions, like Disneyland does, will increase or decrease the popularity of those actions and, if affecting the riskiness is not possible, whether one should reward or discourage people to take risk to achieve the outcomes that are most beneficial from the designer’s viewpoint. Economics and econometrics can help tremendously in structuring the understanding of customer preferences and in forecasting how demand responds to new features or pricing.

Subjective Probabilities and the Role of Information

Thus far, we have assumed that the probabilities that people attach to uncertain outcomes are given from outside the model. However, if someone asked me what is the probability with which the ice cream bar downstairs is out of cappuccino-chocolate, I would find it difficult to come up with a precise number. Still, I am able to choose whether to go out for an ice cream or stay inside. Does this mean that our previous expected utility model is completely worthless? Not necessarily. Just as we think about the utility functions, maybe also the numeric probabilities are just modeling devices that help us analyze people’s choices. This leads us to the following question: when are an agent’s actions compatible with a model where the agents acts as if he or she had some subjective probabilities in mind for each uncertain state of the world? This question is answered by the models of Savage (1954) and of Anscombe and Aumann (1963). These models give exact (and testable) conditions under which a person’s behavior is compatible with a model where she acts as if basing her actions on estimating some subjective probabilities. The framework is relatively technical compared to the scope of this chapter, and hence we will not present the assumptions of the model here. However, we want to emphasize that the models are relatively general, and very often the expected utility framework gives a good description of people’s decision making. However, there are many behavioral biases discussed in the section on behavioral economics that are systematic ways in which people’s behavior deviates from the model predictions. Designers of gamification patterns should be mindful of these situations, as the applicability of the models presented earlier decreases when biases increase.

Of course, Savage’s “subjective probabilities” do not live in a vacuum. They are strongly affected by the information we have. When we get new information, we tend to adjust our probability assessments. If I read a weather report saying that there is zero percent chance of rain in the next two hours, I am quite likely to find eating ice cream outside more appealing than before, because the new information has influenced my beliefs. The mathematical model for adjusting existing probabilities to new information is called Bayesian updating or Bayesian learning.

Many gamification solutions alter the flow of information to users. Instead of attempting to add information, gamification might seek to obscure or hide information with the aim of increasing the value of taking certain actions over others. For example, in Chorewars rewards are intentionally distributed randomly in order to maintain anticipation in every house chore a player completes. This intentional obscurity surrounding the reward distribution has also another important effect: if for example vacuum-cleaning always yielded the most prestigious reward, players would start overproducing it, and
the cleanliness of the bathroom might go neglected. In contrast, gamification can also help in displaying information in a more comprehensible form and help agents to use it more efficiently. In accordance with Reeves and Read (2009), visual aids and interface design patterns, such as levels and progression metrics, can help to achieve some of these goals.

The Role of Game Theory in Managing Strategic Interaction

Consider again my local Starbucks. If suddenly all the local coffee drinkers started to compete with me for the mayorship of that establishment and if I valued being a mayor enough, I might be persuaded to start going to the nearby Dunkin’ Donuts instead—even if I preferred the coffee in Starbucks over the brew in Dunkin’ Donuts. Oftentimes, gamification relies on the fact that the actions of others affect the way I act, and my actions affect the decisions of others. The study of this type of strategic behavior is the core of economic game theory. The above-mentioned competition for mayorship is a prime member of a class of games known as congestion or coordination games.

The first application area of game theory when designing gamified services is to design better or more engaging “games” inside the service. Game theory helps us understand optimal ways to play a given game when the players’ goals are well defined. Through trial and error, people are often able to get very close to this optimal solution. If the solution is too trivial and deterministic, people often find the game childish and not very entertaining. Economic theory offers a wealth of classes of games with non-trivial solutions and optimal outcomes that have a random component. Such games are often likely to be entertaining as well. A prime example of how economic game theory can be used to devise engaging games is a board game called Modern Art, where players auction art to one another using rules that resemble auctions studied in auction theory—a subclass of game theory.

Game theory also helps us to understand what kind of implications a given social design pattern may have. If people start to behave in an unintended strategic way due to a given design pattern, this may lead to unexpected results. For instance, one might argue that me going to Dunkin’ Donuts probably decreases total welfare, as I enjoy their coffee less. It is unlikely that the designers of Foursquare intended me to drink worse coffee. In other words, the strategic dimension of Foursquare may encourage users to visit a variety of cafés, however it can nudge us to make choices we otherwise dislike.

This chapter is too short to give a complete introduction to the methods economists use to analyze strategic behavior and the type of games that are most commonly considered. Osborne (2004) offers a nice introduction with examples. Mathematically more confident readers should take a look at Fudenberg and Tirole (1991).

Some Economic Application Areas of Gamification

In this subsection, we discuss some common economic problems and goals to which gamification can offer a possible solution.

Increasing Activity through Adding Value and Increasing Available Information

The simplest way gamification works is by making certain actions more valuable, which leads to an action becoming more popular. Some existing examples include promoting sales (Samsung Nation), making exercise more fun (Fitocracy), or achieving one’s goals in life (Mindbloom). Reeves and Read
(2009) also suggest that making work more like playing games would lead to higher productivity.

Many gamified features also typically convey information in a concise and efficient way. This in turn helps people to make more efficient decisions when facing uncertainty. Badges, status bars, and achievements are the most prominent examples. Another design feature borrowed from massively multiplayer online role-playing games (MMORPGs) and used as a solution to many modern resource allocation problems is the creation of a virtual market and virtual currency. As textbook microeconomic theory suggests, market prices are a very concise way of conveying information on people’s preferences and relative scarcity of economic inputs. They also establish wealth as an easily interpretable way to measure success between different users. This in turn can lead to social behavior such as bragging or to “keeping up with the Joneses,” which may further incentivize beneficial behavior.

Correcting Externalities
A large number of existing gamified services can be viewed as attempts to mitigate externalities. An externality arises when an agent making choices does not fully take into account how these choices affect others, and the private costs and benefits of a given action do not fully reflect the effects of these actions on others (see, e.g., Laffont 2008). An example of an externality would be the adverse environmental effects of consumption. For instance, as long as the adverse effects of global warming are not fully incorporated in the price of fossil fuels, everyone tends to consume too much energy from these sources. There are also positive externalities. For example, after reading a book or eating in a restaurant, I will have information on how good that given book or restaurant was. This information may be useful to others, but as long as I do not benefit from others knowing it, I might not divulge what I know. Similar externalities arise commonly in the modern information-centered workplace where expertise on specific areas of operation tends to accumulate to individuals who are in a daily contact with these areas. Parts of this flow of information may be useful elsewhere in the organization, but the employee possessing it rarely makes it public unless incentivized to do so. Researchers have, in fact, shown that extrinsic rewards from divulging information may be counterproductive (see, e.g., Bock et al. 2005), which suggests that intrinsic motivation-inducing gamification may indeed be a highly suitable way to entice information sharing in an organization.

Gamification has been either suggested or applied as a partial solution to all of the issues outlined above. In all of these solutions, the idea is to increase the value of taking the socially preferred action. For instance, in EcoIsland, neighbors were put in a competitive setting in order to increase the relative value of sustainable behavior through social conformity and the fear of faring badly in the competition. Similarly, the status bar in LinkedIn and badges in FourSquare encourage users to publicize private information. In a similar sense, Reeves and Read (2009) outline multiple ways how gamifying the workplace may lead to better flow of information.

Experience and Credence Goods
Strongly related to information externalities are experience (Nelson 1970) and credence (Darby and Karni 1973) goods. An experience good is a product or service such as a meal at a restaurant whose quality or price can be fully ascertained only by
purchasing and consuming the product. Credence goods, in turn, are products or services such as a car repair whose quality is difficult to ascertain also after purchase. For example, it can be hard to know whether engine problems after an oil change are due to normal wear and tear or the mechanic skimping on costs when changing the oil. The problem with these goods is that the lack of information tends to lead to underconsumption of good-quality products and overconsumption of bad-quality alternatives. Furthermore, if the seller knows the quality of the product better than the buyer, the seller may have an incentive to sell an inferior product masking its quality. If consumers understand this and are unable to verify the quality of the products offered, they are likely to treat all products as if they were of bad quality, and their willingness to pay for any product falls. This in turn leads to further incentivizing the suppliers to sell bad products given that producing quality costs more. In the end, the market is likely to supply only bad quality. This is a stylized version of a market where adverse selection leads to full or partial shutdown of a market. The example was first described in George Akerlof’s (1970) seminal paper that describes how “plums” get crowded out by “lemons” in the used car market.

Gamification may help to incentivize people to publicize their private information. The service Four-square is a prime example of a service that uses a service design that promotes social aspects, such as getting recognized, social conformity, and competition, to these aims. Social aspects have been found to be strong predictors for adopting gamification (Hamari and Koivisto 2013). When information about the quality of the goods produced is public, there will be incentives to hold up a good reputation by producing good quality.

Game mechanics can also be used to encourage users to try out a service. If the probability of a consumer liking the service is relatively low, she may find it too costly to try out the service in the first place. This is especially true with many IT services that are targeted to niche customers. Making experimenting competitive or awarding badges or points for trying out different features of the service may make the process more pleasant and appealing.

General Mechanism Design Problems
Consider three separate cases: a monopoly selling goods to a heterogeneous population; a government deciding on the amount of public good produced; and the problem of allocating rights to a common resource. A real-world example of the first case would be a lone airline serving some route and facing demand from both business travelers and tourists with very different willingness to pay. An example of the second case would be the decision about how much should we invest in national defense or reducing air pollution. Both are goods that are generally non-excludable (i.e., once produced it is hard to keep anyone from enjoying its benefits) and non-rivalrous (me consuming the benefits does not considerably reduce your ability to enjoy them as well). Public goods are usually defined as goods holding these two properties. An example of the third case is fish in the sea or commonly owned grazing land, which are non-excludable but often rivalrous (the fish I catch reduce the total number of fish available to you).

All of these examples share the feature that there is a single actor who is able to design the institutions that the participating agents must use and follow. Their goals may differ: the monopolist is likely to choose the institutions to maximize its profits, while the government will try to maximize some form of
social welfare. The study of how to choose the underlying institutions to best achieve these goals is called mechanism design; see, for example, Myerson (2008) and Fudenberg and Tirole (1991). What often makes the problem interesting is that the population interacting with the institutions has aspirations that are not fully aligned with the designer’s goals or with the aspirations of other participating actors. Thus, strategic interaction is likely to arise, and the situations are best analyzed using game theory.

The tension in most of the mechanism design problems is driven by the fact that the designer does not perfectly know how the actors rank the different social outcomes. In other words, there is a problem with asymmetric information. If the designer has access to information that is correlated with agents’ valuations or other private information, the designer can potentially use this correlation in the design of the mechanism to better achieve her goals. This idea is used a lot by price-discriminating airlines that typically increase their prices as the departure date approaches. The companies know that business travelers become aware of their traveling needs relatively late and are willing to pay for a specific date, while tourists have more flexible schedules and constrained budgets. The mechanism of rising prices, thus, uses this correlation between willingness to pay and the timing of purchases to sort out different types of buyers.

Similarly, gamification can be used to reveal private information. This means that a person’s behavior in a game can tell something about the person’s behavior outside the game. For example, game-like mechanics can be used to reveal information on user experience and preferences, which in turn help in pricing products (e.g., Samsung Nation). Similarly, Reeves and Read (2009) suggest implementing competitive guild-like structures imitated from MMORPGs at workplaces to sort out employees with the highest leadership potential. They argue that the social interactions that take place in guilds in MMORPGs sort out natural leaders in a more organic way than job interviews and occasional promotions due to good performance in a non-managerial position.

Last, one can argue that the popularity of Ebay and other auctioning sites is due not only to the successful implementation of basic principles from the mechanism design literature but also to the fact that people find auctions suspenseful and requiring the type of mastery seen in entertaining games. As the solutions to many mechanism design problems often have features like side bets (see, e.g., Crémer and McLean [1988]) and randomization over outcomes (Abreu and Matsushima 1992) originally seen mostly in gambling, in addition to having analytically desirable properties, these mechanisms could turn out to be engaging if implemented in an entertaining manner.

Behavioral Economics

In contrast to neoclassical approaches, which assume that customers are rational and act based on their true conscious preferences, behavioral approaches acknowledge that people might not be so directly rational but instead have “bounded rationality” (Simon 1957) because a decision maker never has all the information about all the different outcomes of a decision or their likelihoods of occurring or the
processing power to calculate them. Therefore, decision makers use heuristics when faced with decision-making situations. These heuristics are rough but commonly efficient (mental) models for the optimal behavior in given situations. However, in certain situations these heuristics may misfire and lead to suboptimal outcomes or at least to different outcomes than the ones predicted by neoclassical theories. Behavioral economics studies how people deviate from the axioms of rational decision-making.

As discussed earlier, gamification can be seen as a means to increase value of certain options and thereby make people more likely to select them. However, in behavioral economics, as opposed to increasing or decreasing the value of the actual outcomes directly, behavioral biases can be seen as innate mechanisms within the decision maker that increase or decrease the value of given alternatives even though the actual external outcomes from the decision-making situation were not otherwise tampered with.

It would be impossible to cover comprehensively all the empirically demonstrated decision-making biases within this chapter. For a thorough investigation on the subject of biases, we recommend to the readers Advances in Behavioral Economics by Camerer, Loewenstein, and Rabin (2003) and Thinking, Fast and Slow by Kahneman (2011). Here, we discuss a few biases, which are especially of interest in the context of gamification.

Exploitation or Gamification for Good: Example from Prospect Theory and Temporal Choice

One underlying assumption concerning gamification has been that it can tap into the behavioral biases of users and, hence, have persuasive power beyond mere addition of value to products. Gamification has been dubbed exploitationware because it has been viewed as a cheap trick to entice people into activities that they would not otherwise want to do. This thinking originates partly from early Facebook games that intentionally attempted to invoke behavioral biases in order to make people purchase more virtual goods (Hamari 2011). For instance, many of the mechanics were based on degrading players’ earned virtual goods unless they frequented the game or purchased virtual goods that prevented this. These mechanics were especially related to one of the cornerstones of behavioral economics: prospect theory (Kahneman and Tversky 1979). Prospect theory posits that people’s value function is S-shaped and based on reference points instead of absolute values (figure 5.2). Furthermore, prospect theory shows that the value function is concave for gains and convex for losses, implying a diminishing sensitivity. This implies that mere gaining and losing have intrinsic positive or negative value. Moreover, studies show that losses have a greater impact on welfare than gains of a similar size.

Games that were seeking to increase player retention used this bias and attempted to anchor (on anchoring, see Tversky and Kahneman 1981) the reference point of the player as high as possible with regard to how much virtual assets the player owned. Consequently, knowing that losing those assets has a proportionately greater impact on the player, the designers came up with mechanics that would delete those assets unless the player took actions the designers wanted them to: to come back in the game. When looking at gamification from this angle, it is not surprising that some perceived it as tricking people into activities that they would not want to do.
The diminishing sensitivity to gains and losses has clear design implications for gamification: to maximize perceived total value of rewards, the designer should separate gains into small chunks and conversely losses should be combined into larger chunks (see figure 5.2). This way the player does not have to suffer the extra loss multiple times but can enjoy the extra gains from multiple rewards, and the total perceived value of the players could increase dramatically.

Just as the previous example shows, gamification does not necessarily “trick” people into behaviors they would not otherwise pursue. In fact, most gamification seems to attempt to do the exact opposite by tapping into cognitive biases to nudge a decision-maker’s behavior into her own desired direction.

A case in point is “hyperbolic discounting” (Ainslie 1975), which refers to a decision-making bias to favor outcomes that maximize short-term gains rather than long-term gains. In gamification and games, this phenomenon is related to favoring instant gratification. In the caveman era, it could have been favorable to eat all the food once it was acquired because storing was frivolous and theft was a pertinent problem. However, in contemporary society, where there might not always be a serious need to enjoy the short-term benefits, but instead a longer-term plan would be optimal for overall benefit, hyperbolic discounting can lead to extremely negative outcomes. Nevertheless, hyperbolic discounting bias still looms with outcomes such as procrastination, skipping exercise, smoking, and overconsumption. People

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**Figure 5.2**
The S-shaped value function of prospect theory.
commonly notice these problems in their behavior and seek a variety of ways to remedy them. In fact, there is already a plethora of services attempting to gamify these kinds of difficult choices and behaviors that are commonly ridden with hyperbolic discounting problems, such as fitness (Fitocracy), housekeeping (Chorewars), and even keeping up with one’s aspirations in life (Mindbloom). All of these services attempt to structure these relatively long-term activities in a way that is imbued with short-term goals and rewards. Clearly, gamification has been used for encouraging people to make “good” decisions.

In behavioral economics, there is a concept that is closely related to gamification. This optimistic view to behavioral biases is called choice architecture. It is a form of soft paternalism: “it tries to influence choices in a way that will make choosers better off, as judged by themselves” (Thaler and Sunstein 2003). It aims to design decision-making situations in such a way (Thaler and Sunstein 2008) that harmful biases could be avoided and/or beneficial biases amplified. Following this line of thought, it can be argued that behavioral economics or gamification have no intrinsic exploitation built into them. The goals of the gamifying party, in the end, determine what purposes gamification is implemented for and how it is designed to affect user/customer behavior.

Risk and Ambiguity

Earlier in this chapter, we discussed certainty and uncertainty and how gamification is being used to affect the expected value of outcomes by affecting the certainty by which the different outcomes are likely to manifest. Behavioral economics, however, adds an interesting twist to how people experience uncertainty. Empirical studies show that people are generally risk-averse and that people are even more hesitant to partake in behavior if there is uncertainty about the level of uncertainty. In these situations, decision makers are generally unable to combine the two levels of risk into a single uncertainty factor. This creates a higher perceived level of uncertainty, which translates into negative value and leads to avoidance of such alternatives. This phenomenon is called ambiguity aversion (Fox and Tversky 1995), and it contradicts the independence axiom in the Savage model presented earlier (Savage 1954).

For instance, a major problem in market design is how optimally to match resources to such value creation where most value would be produced (Roth 1984). In practice, this means, for example, the problem of optimally matching people to professions in order to maximize economic growth. Choosing one’s education path is a tricky decision process. The longer one studies, the more risk one exposes oneself to. With vocational schooling, which is commonly shorter in duration, the risks of getting a job and decent salary are easier to estimate compared to a longer-duration university education, where it is more difficult to estimate the subsequent employment and salary level. Although it would be generally believed that longer education leads to better employment, the looming multilevel risk involved leads to overvaluation of shorter-duration education, because the odds are easier to grasp. Therefore, from a behavioral perspective, the lack of information might be an even more difficult problem because people are less likely to select options that are clouded in uncertainty, although from a rational perspective there was no reason to suspect that the odds would be any worse even if they are unknown.

However, as also with risk aversion, people tend to be ambiguity-loving when the expected outcomes
are negative (Wakker 2010), simply because people are loss-averse and the ambiguous alternative provides some chance not to have an outcome that is worse than the reference point (Kahneman and Tversky 1979). This has been articulated as the “end-of-the-day” effect based on betting behavior toward the end of the day when people are likely to take big risks in order to prevent losses (McGlothlin 1956; Ali 1977). End-of-the-day effects are also familiar from games. People who are likely to lose start taking bigger risks if they want to have any chance to win. However, taking a more risky gamble is also more likely to lead into an outcome where the decision maker would be worse off. In summary, with ambiguous gain situations, people tend to be ambiguity-averse and the opposite in situations where the decision maker is losing. In both, either avoiding or “loving” the ambiguity can lead to suboptimal outcomes.

As with uncertainty issues described in the previous section, remedies for situations where ambiguity aversion or ambiguity favoring are relevant are also related to either increasing or decreasing knowledge depending on the direction in which it is favorable to nudge the decision maker. Also here, Foursquare is a prime example of a service that produces more knowledge about restaurants in terms of quantitative (visit amounts) and qualitative (reviews) information. Here gamification is used to share information.

Setting Goals

Games are excellent in getting players committed to goals (Locke and Latham 1990). Therefore, gamification is an especially interesting phenomenon from the perspective of consumer behavior. Consumer behavior literature has found that mere goal-setting increases performance in three ways: (1) people anchor their expectations higher than what is expected of them, which in turn increases their performance; (2) assigned goals enhance self-efficacy; and (3) completion of goals leads to increased satisfaction, which in turn leads to increased future performance with the same activities (Bandura 1993). These effects are further strengthened if the goals are context-related, immediate, and the users are provided with immediate feedback. Research also suggests that if the goals are clearly specified in terms of how many times they have to be completed, the rate of completion of the tasks increases (Ling et al. 2005). Moreover, even only the sense of progress can invoke more of the same behavior (Kivetz, Urminsky, and Zheng 2006; Nunes and Drèze 2006).

Accordingly, badges (e.g., Hamari and Eranti 2011) for instance provide all of the above-mentioned aspects that increase goal commitment. Badges assign clear goals to which users can anchor their expectations as to what is expected of them. Furthermore, badges are commonly implemented via metagames that are directly context related and therefore tap into a context that is already meaningful to the user. Immediate feedback can further strengthen self-efficacy and satisfaction during the interaction with the system. By tweaking goals and progression, designers can further tap into behavioral biases related to, for example, goal gradient effect (Kivetz et al. 2006) by altering the perceived rate of progression (Nunes and Drèze 2006). However, there seems to be evidence that the successfulness of such gamification effort is context dependent (Hamari 2013). This suggests that although badges are effective in games, outside games users might not get committed to the goals badges provide.
Technological Persuasion

Another related, more technologically oriented vein of study, called persuasive technology or captology, concentrates on changing people’s attitudes and behavior. Persuasive technologies are interactive computer systems designed to change the attitude and/or behavior of the user mainly through IT-based communication and social influence (Fogg 2003). The term thus clearly overlaps with gamification. For instance, some persuasion mechanisms can be regarded as similar to those applied in gamification, such as feedback and rewards (see, e.g., Hamari, Koivisto, and Sarsa 2014; Hamari, Koivisto, and Pakkanen 2014; Oinas-Kukkonen and Harjumaa 2009).

In marketing and information systems sciences, there is a long tradition of studying the interaction of technology, psychological outcomes, and behavioral outcomes. Gamification thus seems to fit well into the existing enquiry within these fields as an expansion of consumer behavior literature related to hedonic consumption (Hirschman and Holbrook 1982) and to intrinsic motivations (Deci and Ryan 1985). Therefore, within a long-run research technology acceptance (e.g., Davis 1989), gamification could be viewed as an attempt to invoke hedonic aspects (van der Heijden 2004) and intrinsic motivations (Deci and Ryan 1985) in order to make systems with utilitarian outcomes more appealing. With the increase of such aspects as perceived flow (Csikszentmihalyi 1990), enjoyment, and mastery, gamification seeks positively to influence continual usage intentions (Bhattacherjee 2001; Hsieh, Rai, and Keil 2008), actual use, and other relevant behavioral outcomes relevant to the gamified activity. Gamification offers an interesting vein in this continuum of research.

Gamification from the Perspective of Marketing

Now, let us take a look at gamification from the perspective of marketing, one subfield of economics. Before doing this, it is necessary to shed some light over the concept of “marketing.” Over the years, there has been extensive debate over the role of marketing: whether it is a science or only a standardized art (Sheth, Gardner, and Garrett 1988). North American scholars have had a tendency to see marketing as an organizational function executed by one department in a company, whereas European scholars have emphasized the importance of marketing as a mindset or philosophy that should be spread throughout the organization.

Regardless of the emphasis one prefers, examining gamification through the lens of marketing is necessary, as many examples of gamification, from LinkedIn’s persuasive user profile to Gmail’s game-like invitation systems to the way cafés use Four-square to engage their customers, are so evidently connected to these companies’ customer acquisition and retention strategies, which are clearly in the heart of marketing. Furthermore, many marketing strategies from customer loyalty programs to direct sale concepts such as Tupperware parties can be viewed as gamification strategies with fixed rules such as points, levels, and playful interaction.

The challenge, however, is that the term gamification does not have its roots in marketing theory or in economics in general but stems rather from
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Thus, there is no single definition for gamification that would fit the various theoretical constructs of the scientific marketing literature. Therefore, in this section, we will discuss marketing and some prominent paradigms within it using Foursquare in various service environments as an example (box 5.1). We will look at transactional marketing theory, relationship marketing theory, service marketing theory, and experiential marketing. This list of theoretical approaches is by no means exhaustive, but we hope that it will provide a relatively rich view on the subject at hand and that this introduction will spark new ideas both for practitioners as well as for academics.

**Box 5.1**

**Foursquare**

The service Foursquare is a location-based social networking service that was founded in the United States in 2009. It allows its users to check in at physical venues by using a mobile application, mobile web browser, or by sending an SMS text message. Users of the service may “friend” other users and thereafter be notified of their respective check-ins. Users receive points for each check-in, and when a user hits a milestone, she is awarded with a badge. There are many types of badges and multiple ways to earn them. Some are linked to frequency, some to location, and some to the variety of venues visited. The user with the most check-ins in a given venue within a certain time frame becomes the mayor of the venue. Users can also upload photos to the system and write venue-related tips to other users.

**Transactional Marketing Theory**

Transaction marketing theory emerged in the 1950s to serve manufacturing industries. Its aim was in creating markets for mass-produced goods by connecting supply and demand. It was based on the belief that competition and self-interest are the drivers of value creation (Sheth and Parvatiyar 1995). Transactional marketing theory sees marketing as an independent function inside a company and the customer as a rational decision-maker.

From this classical marketing theory perspective, Foursquare can be seen as a combination of a loyalty stamp card system and a peer-to-peer advertising tool. By checking in to a café through Foursquare, the customer receives a stamp on her virtual loyalty card. After a certain number of check-ins to the same café, the customer receives a discount coupon from the café. Thus, it is the reward of the gamified service that gives the monetary incentive for the customer to participate in the campaign. From the service provider’s point of view, the mission of gathering points (i.e., the series of future check-ins) will connect future production with demand that will possibly lead to future sales and additionally promote the firm to other customers. Thus, gamification when seen from the perspective of transactional marketing theory can be considered as game-like mechanisms that attract customers’ attention to the product and as a means to segment different customer groups from one another (see, e.g., Hamari and Tuunanen [2014] for segmentation of players).

**Relationship Marketing**

Relationship marketing (RM) emphasizes the relationship that builds between the customer and the
firm in the long run (Sheth and Parvatiyar 1995). Relationship marketing scholars argue that relationship-oriented marketing practices date back to the preindustrial era. RM aims to enhance marketing productivity by achieving efficiency and effectiveness through long-lasting relationships that are based on mutual cooperation, commitment, and trust. RM acknowledges also the importance of other interaction parties (other customers, competitors, third parties) to the relationship. Customer relationship management (CRM) can be characterized as techniques to handle customer relationships in practice (Gummesson 2008).

From the RM perspective, a café owner can see Foursquare’s check-ins, tips, and badges as ways to understand better his customers by observing what sort of drinks they are fond of. He can also propose new missions to loyal customers by rewarding those customers who try out new products or visit multiple locations. Thus, Foursquare incorporates features of a CRM system. Potentially, Foursquare can be seen also as a platform for cooperation with other service providers. A restaurant and a café can, for example, propose a common mission and reward. From the customer’s point of view, Foursquare is a way to express commitment to a service provider.

Service Marketing

The pioneers of service marketing theory claimed that transactional marketing theory that was based on the exchange of goods was not suitable for service industries and that a new theory was needed for the purpose of service marketing.

Service marketing emphasizes the process nature of services. It sees marketing as a philosophy that should guide people, processes, functions, and departments in an organization (Grönroos 2007). It considers the customer always as a coproducer of the service and that value is created when the customer uses the service. Service-dominant logic (Vargo and Lusch 2004) takes service thinking further and suggests that this approach should be applied to marketing in general, as in the end goods are only distribution mechanisms for service provisions that take place when customers use the products. Thus, all economies can be considered service economies.

From the service marketing perspective, gamification can be seen as a “process of enhancing a service with affordances for gameful experiences in order to support user’s overall value creation” (Huotari and Hamari 2012). From this point of view, Foursquare enhances a café experience by proposing gameful elements to it in the form of badges and missions. They form together a service system that can lead to gameful experiences that differentiate the café from its competitors.

Experiential Marketing

Pine and Gilmore (1998) claim that as products and services become ever more commoditized, creating value requires memorable experiences that unfold over time. Experience is considered here as a subjective and internal response, encompassing both rational and emotional reactions of the individual to interactions with the firm, its brand, its service, or its product as well as with third parties such as other customers, press, competitors, and so forth. These experiences create memories that accumulate over time and affect the future experiences (Verhoef et al. 2009). Compared to relationship marketing and to service marketing, experiential marketing emphasizes the hedonic and emotional aspects of
consumption as well as the unique, individualized, and memorable aspects of experiences. An example of such an experience is a visit to Disneyland. Pine and Gilmore (1998) also claim that in a mature experience economy, service providers should always charge an admission fee for this sort of experience. However, Gupta and Vajic (2000) find charging a fee to be a separate issue from how an experience is created.

If one adopts Gupta and Vajic’s view, it is easy to imagine how gamification can be used in customizing an experience and in making it more memorable. A café owner could use Foursquare’s tips feature to design tasks for his customers and make the café experience more individual and game-like. He could also identify participating customers and, for example, greet them when they check in making their café experience much more personal. Also, Foursquare could be used to record and share these experiences using text, images, and stories, all familiar elements of games.

Discussion: Positioning Gamification

One of the missions of this chapter was to decipher what is the added value that gamification brings to the economic discourse. The task was not difficult not only because the concept does not originate from economic sciences but also because it touches so many variables of economics. Its application areas can vary from very small details such as the LinkedIn profile’s progress bar to the core of a company’s strategy as with Tupperware parties. It can also be applied to various domains from organizing team-work at workplaces to affecting our decision making at dry-cleaners or to our social practices at a coffee shop. In addition, the mechanisms that can be used for gamification are virtually limitless.

Our observation when writing this chapter has been that when we investigate in isolation the effects, the means, or the persuasion methods of gamification from any given economics perspective—be it neoclassical economics, game theory, behavioral economics, or marketing—we do not find anything new or surprising. For an economic choice theorist, gamification patterns are just design features affecting people’s choices either through making a given choice more valuable or making the competing choices seem less attractive. More subtle ways include affecting the information or uncertainty people have about outcomes or tapping into some of the behavioral biases that people exhibit in their daily decision-making. Such goals are shared by many existing real-life services that have very little to do with games. A game theorist adds to this that people’s behavior when interacting with many social gamified design patterns can be analyzed using concepts from game theory. But this also applies to almost any situation that involves decision making in a social context. Last, as was pointed out in the previous subsection, many of the actual design patterns are almost identical to existing marketing practices.

However, we miss the forest for the trees with regard to the essence of gamification because of the high level of generality of the economic theories. When we take a step back and remind ourselves that in the heart of gamification is the individual’s game-like or gameful experience, the usefulness of the term starts to become clearer. Gamification is a tool for service design that has two different goals. One is the desired economic outcome that the company seeks via gamification. The other one is
the individual experience leading to that outcome that gamification helps to provide. The novelty of the concept of gamification is that it binds these two goals together, and its beauty is in the fact that it incorporates the idea that in successful gamification, one goal cannot be reached without the other.

Conceptualizing gamification from this perspective helps us further to pinpoint specific psychological and behavioral outcomes that are related to it. We argue that through these constructs, gamification can, in fact, be conceptualized as a new concept. Gamification attempts to provide a set or a part of experiences reminiscent of games. On the first level, they can be experiences such as flow (Csikszentmihalyi 1990), intrinsic motivations (Ryan, Rigby, and Przybylski 2006), self-efficacy, autonomy, and perceived competence that on another level can increase, for instance, goal commitment, which can further lead to behavioral outcomes such as continued use (see Bhattacherjee 2001) and healthier choices. In this vein, however, it is also possible to use gamification to bring about behavioral outcomes that make the user worse off. Gamification stands out from other concepts, such as persuasive technology (Fogg 2003), which attempts directly to change behavior and attitudes through persuasion, and loyalty programs, which attempt to affect behavior by providing economic benefits. Furthermore, gamification could be seen as an overarching concept in the sense that it can be utilized to influence behavior in several domains by providing gameful experiences that subsequently can influence attitude and behavior or affect customer loyalty or decision making.

Notes

1. When the number of possible choices is infinite, one also needs a more technical smoothness or continuity axiom that guarantees smooth numerical comparability between groups of choice bundles. See, for example, Mas-Colell, Whinston and Green (1995) or Kreps (1988) for more details.


3. See also the excellent treatment of both of the models in Fishburn (1970) and a complete treatment of Anscombe-Aumann and an introduction to Savage in Kreps (1988).

4. People are notoriously error prone at learning optimally from available information; see, for example, Anderson and Holt (1997) and Hung and Plott (2001) on Bayesian updating and information cascades and Friedman (1998) on the famous Monty Hall problem.

References


