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Users' participation in virtual communities

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ABSTRACT

The main aim of this dissertation is to examine in depth some aspects of the participation process to a virtual community. We used the model of goal-directed behavior (MGB, Perugini & Bagozzi, 2001) to investigate the role of motivational factors in the processes of active contribution and use of web community resources in online communities. Given the social dimension of a virtual community, similar to other authors (Dholakia and Bagozzi 2002, 2006a, 2006b; Bagozzi, 2011) we introduced the concept of we-intentions from Toumela's work (1995) in addition to individual intentions.

Nielsen (2006) analyzed the contribution process defining the inequality in the contribution as the tendency for most web community users to participate modestly, while only some community members represent the active part of content production (1% as active content producers, 9% as content modifiers). Drawing from this idea, our research question was to better understand what are the factors that may inhibit a user from participating in a virtual community.

The first study, a longitudinal research, aimed at identifying the processes underlying the willingness to actively contribute to a virtual community. Users from a virtual community of practice (N = 263), namely HTCBLOG.com, were considered for this study. A first plus of the present study is that we used a measure of an actual behavior of contribution. We tested the MGB considering the we-intentions to contribute but the first model tested did not predict the observed behavior. The introduction of greed and anonymity constructs to the MGB led to an increase in the explained variance in the observed behavior.

In the second study, which was longitudinal, following the suggestions offered by Antin & Cheshire (2010), we decided to deepen the meaning of participation to a virtual community considering the idea of participation not necessarily identified with active contribution. Indeed, an individual can feel as a part of the community, simply because as a member he/she may access and read community contents. Drawing from this assumption we hypothesized that participation might be divided in two distinctive behaviors: active contribution and the individual use of contents by reading. Respondent to our survey were members of a virtual discussion forum (N = 428), namely PIPAM.org. Also in this second study we used a measure of an actual behavior of contribution. Using the MGB rationale plus collective intentions, we focused our attention on the distinction of the three processes of contribution, use of community contents and participation. We found that the we-intentions to participate were promoted by the we-intentions to contribute and by the we-intentions to use community contents by reading. Moreover, the participation behavior was predicted by we-intentions to participate as well as by the behaviors of contribution but negatively by the community contents usage behavior. Greed confirmed the negative significant effects on contribution process, whereas it showed a positive effect on the use of contents by reading instrumental behavior.

1 CHAPTER 1 – Theoretical Background

1.1 Introduction

The Internet has been in existence for almost 30 years, but it is only in the last 15 years, since the advent of the World Wide Web, that it has become widely accessible almost to everyone and also easy to use. The Internet growth has been described as “the most astonishing technological phenomenon of the late twentieth century” (Cairncross, 1997). During the last six years, we have witnessed a second network transformation: the Web has become something “social”; the emergence of several social networks, virtual communities and chat systems has made the web a tool to socialize with other individuals and to maintain social relationships, to the point of talking about "Social Media".

Since the idea of “Web 2.0” was born in 2004 (O'Reilly, 2004) the enthusiasm around it has increased enormously. This was mainly due to the enormous spread of second-generation web tools and their use by hundreds of millions of users. Indeed, we have seen in the last years the rise of more than 1.500 Web 2.0 sites and tools including wikis, blogs, social networking sites, social bookmarking, photo and video sharing services. Some of them have become widely adopted by users; For example, Facebook claimed to count more than 350 million active users in 2010, half of which logged on the website everyday to upload and share more than 3.5 billion pieces of content; every week 20 hours of video were uploaded to YouTube every minute. thus Internet, under the label of “Web 2.0” can be considered a set of new technologies and behaviors (Zittrain, 2008). With the rise of the social web, new technologies have been developed and more and more we hear about the Internet as “architecture of participation”, or the web as a “platform, harnessing the collective intelligence” (O'Reilly, 2004). Web 2.0 has led to online social interactions based on collaboration and content sharing (Cooke & Buckley, 2008). Those collaborative practices and dynamics, give a role of first relevance to the collectivity of Internet users. The mainly passive audience in the first generation of the web is now addressed as a more and more active and empowered audience. Thus,

this would represent a new “era” of users active participation, characterized by content production and sharing. Today we are witnessing the spread of plurality of mobile devices and service-oriented social media, integrated in various types of terminals that can access the network (mobile phones, PDAs, smartphones, laptops). All this encourages the users to share their contents and ideas. Thus, the creation of information becomes a bottom-up process. However, the rule of 1-9-90, also known simply as the rule of 1% (Nielsen, 2006) suggests that only 1% of the web users is active in content production. Although hundreds of thousands of users access YouTube every day, only 0.5% of them are also a "producers" of video content. Even for Wikipedia only 0.75% of the total users actively contribute into writing and publishing articles. This inequality between active contributors and general users, suggests that participation in an online community is articulate. We can easily define two different modes of community participation: a user can be a content producer or he/she can be a reader of the contents offered by the community without being an active contributor.

The main goal of this research is to deepen and broaden research on the participation in virtual communities, in terms of shared intention and behavior. The contribution behavior has been studied by several authors with different theoretical frameworks (Bagozzi, 2011; Bagozzi & Dholakia, 2006b; Bock, Zmud, Kim, & Lee, 2005; Chen & Chen, 2009; Cunningham & Leuf, 2001; Kang, Lee, Lee, & Choi, 2007; F. S. L. Lee, Vogel, & Limayem, 2003; Rafaeli, Hayat, & Yaron, 2009; Ruggiero, 2000; C. C. Wang & Cheng, 2006; Wasko & Faraj, 2005; Yu, Lu, & Liu, 2010).

The research question we wanted to answer was to understand what processes differentiate the two types of online participation; thus, what motivates a user to produce contents and, in a complementary way, what prevents this behavior in the majority of the community members?

The answer to this question could also be relevant for the growing interest in social media, which is affecting organizations and workplaces. This is demonstrated by the introduction of business profiles in Facebook, or the development of business social media like LinkedIn. The users' input is critical for the success of a collaborative social medium, or generally for the

development of a web community. Revealing the processes by which a user chooses to read contents, simply assuming that some other users produce these contents, could lead to the development of strategies to improve participation in virtual communities, offering more tools for the social web to improve interactions among people.

1.1.1 The web today: From the society of information to the society of participation.

The development of digital technologies and new media is rapidly changing our lifestyle and our way of relating with others. Web technologies have extended pervasively into our daily lives, helping to significantly alter the structure of society. The Network may no longer be regarded only as a media for communication: it is now a social phenomenon and an integral part of our lives.

In 1994 the creation of the World Wide Web by Tim Berners Lee at CERN in Geneva, provided the major contribution to the development and access to the Internet. According to its inventor, through the World Wide Web the Internet would have to be free and open, without owners. Internet would have to offer information, entertainment and education but, unlike other media, it would grow in a bottom-up process, starting from the users. The web would have ensured greater human freedom and strengthened the claim of social communities (Berners-Lee, 1995). The Web was originally used to display static documents; the first web sites were formed by a set of static pages with text and images, linked by simple links. This was the Web 1.0.

Then, through the integration of databases and the use of systems for content management (*Content Management System* - CMS) dynamic sites were created: the fixed layout of the web-pages was combined with dynamic content. However, contents were still edited by the developers of the web site and rarely by the users. Today the new frontiers of the Internet are linked to the Web 2.0, the new philosophy of the World Wide Web, which allows users to assume a central role in the content production process.

The label Web 2.0 does not indicate a particular technology or a specific application. It rather indicates a set of trends in programming and technologies, and consequently a shift in the way people use the web.

The most significant element of the Web 2.0 is the ability to facilitate relational processes through technological platforms that offer space to everyone to create and share online contents instantly. Web 2.0 applications are those that make the most of the intrinsic advantages of those platforms: delivering software as a continuously-updated service that gets better the more people use it, consuming and remixing data from multiple sources, including individual users. going beyond the page metaphor of Web 1.0 to deliver rich user experiences (O'Reilly, 2005). In other words the web 2.0 represents the transition from the society of information to the society of participation. Web 2.0, therefore, defines and develops new opportunities in the field of information, compared to the traditional media and compared to the Internet of the first generation. It is a new way to access the Internet that focuses on users, on content production and interactions.

1.1.2 Taxonomy of the environments of the web

Through the digitization of information and the diffusion of the Internet new ways of accessing information have become possible. Mitchell (1997) extensively described the changes brought about by digital technologies, referring to the concept of place-less and ubiquitous information brought by the Internet. In his works, Marshall McLuhan (1994) speaks of "a process of implosion": people are more closely related to each other through networks in the electronic age. This process of implosion in distances and time, for McLuhan, produces a favorable situation that allows a "global village" to emerge (see also Harris, 2003). “The immediate prospect for literate, fragmented Western man encountering the electric implosion within his own culture is his steady and rapid transformation into a complex and depth-structured person emotionally aware of his total interdependence with the rest of human society” (McLuhan, 1994, p. 50-51).

The first definition of the word "*time*" in the Oxford English Dictionary is "a space or extent of time" (OED, 2011). The first definition of "*space*" is "denoting time or duration" (OED, 2011). These circular definitions show the bond that exists between these two concepts. The proximity of "time" and "space" reaches its scientific apotheosis in the early twentieth century with the single concept of "space-time" in physics and mathematics. Media open and shape our experiences of time and space (Harris, 2003). Human beings can operate with radically different time-space coordinates through the use of new forms of communication. Internet and new media have changed the role that time and space used to have in our daily lives.

Spaces offered by the web are many and different between them. Bafoutsou, Georgia, Gregoris, and Mentzas (2002) proposed a functional classification of virtual environments according to the dimensions of space and time. This classification allows us to easily identify the type of interaction (synchronous or asynchronous) that can occur between users in a given virtual space.

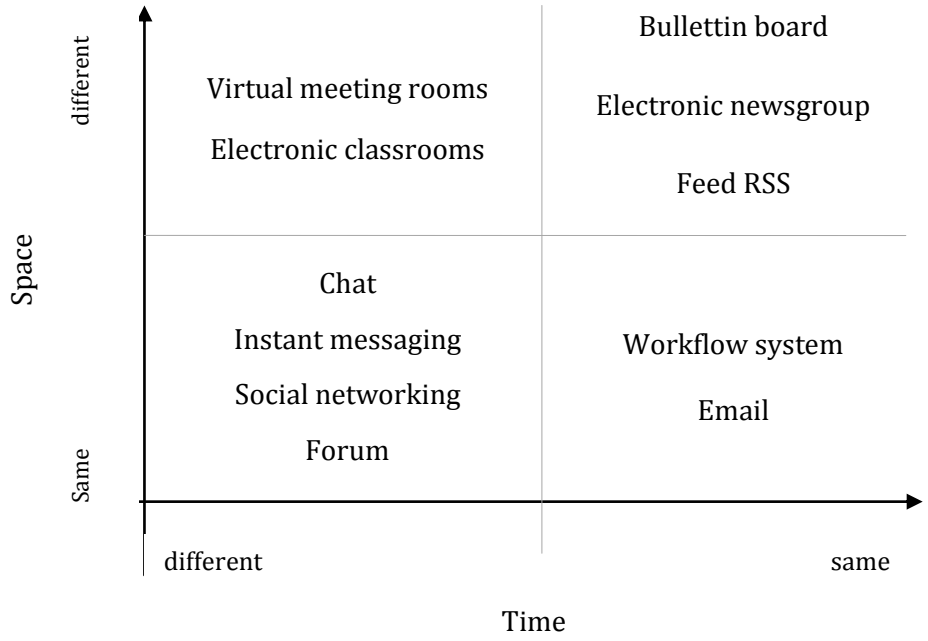

Figure 1. Environments of the web : Time and space classification

The environment we are interested in for our research is that of asynchronous web communities (different time of interaction) supporting a specific forum or similar web based

artifacts for social aggregation. Within these virtual environments, users' contributions revolve around a common and specific theme. The social aggregation takes place through the knowledge sharing on the topic around which the community was born.

1.2 Definition of virtual community

Gusfield (1975) distinguished between two major uses of the term community. The first is the geographic meaning of the word. In this sense, community refers to a neighborhood, town, city or region, implying a sense of belonging to a particular area. The second meaning is a more relational usage, concerned with human relations without reference to any particular location. We use this second description when referring to virtual communities. Nowadays, it is a widely accepted concept for describing dynamic social interactions and relationships within online environments. The term 'virtual' refers to an artifact being ideally real, existing but not concrete (Shields, 2003). Interestingly, the meaning of "virtual" as something that does not really exist has induced some researchers to adopt the notion 'online' to refer to the same phenomenon (Kosonen, 2008). Despite this synonymy, virtual community seems to be a widespread notion in a variety of academic studies (e.g., Ardichvili, Page, & Wentlig, 2003; Bagozzi, 2011; Bagozzi & Dholakia, 2002; Blanchard, 2008; Dholakia, Bagozzi, & Pearo, 2004; Dickinson, 2002; Koh & Kim, 2004; Rheingold, 1993; C. C. Wang & Cheng, 2006)

Virtual communities, of course, are usually dispersed geographically, and therefore are not communities under the original definition, that assumes a community as a geographically circumscribed entity. However, if we consider communities to simply possess boundaries of some sort between their members and non-members, then a virtual community is certainly a community (Wellman, 1999). In recent years, sociologists have suggested that the role of place is less important and that community networks can be maintained even over long distances. This conceptual revolution moved from defining a community in terms of space to defining it in terms of social networks (Dickinson, 2002). We can consider the environments of the web (i.e. forums, wikis,

social networks) around which the community develops, as the geographical area bordering the community.

The definition of virtual community is widely debated in literature, and it is colored with different shades. A very early definition of "virtual community" was coined in 1968 by the Internet pioneers Licklider and Taylor who predicted that online communities would be communities of common interest with geographically separated members; “Their impact will be great – both on the individual and on society” (Licklider & Taylor, 1968).

A new definition of virtual community was proposed by Howard (1993) for whom a virtual communities are “social aggregations that emerge from the Net when enough people carry on public discussions long enough, with sufficient human feeling, to form webs of personal relationships in cyberspace”. This definition includes factors that describe what a virtual community is: the author uses the word “Net” to refer to activities carried out in cyberspace, to differentiate them from real community activities; He talks about public discussion suggesting that participants have discussions with one another, whether to share opinions, knowledge, feelings, or common topics of interest. Thus, there is the implication that topics are generated by participants rather than web site coordinators; Finally, personal relationship indicates that over time, participants develop a relationship amongst themselves (F. S. L. Lee et al., 2003). Hesse (1995) pointed out that a virtual community is “a community that spins time and geography, a community that supplements buildings and streets with personal computers and information superhighways. This definition focuses on the virtual community enabled by technologies designed to move information rather than goods and people. Furthermore, it refers to the idea that Internet cancels the distances of space and time. Hesse appears to view the virtual community from a technical rather than social point of view. Hagel and Armstrong (1997) suggested that virtual communities are computer-mediated spaces where there is a potential for the integration of content and communication with an emphasis on member-generated content. In this definition, the authors focused on the content and communication aspects with emphasis on member-generated content. Similarly, Carver (1999)

suggested that “virtual communities are about aggregating people. People are drawn to virtual communities because they provide an engaging environment in which to connect with other people, sometimes only once, but more often in an ongoing series of interactions that create an atmosphere of trust and real insight” (p.18), emphasizing the purposes of and interaction in virtual community.

Even though discrepancies occur among some existing virtual community definitions, almost all definitions share some similar points, but none of them address all the issues. The similarities contribute to the construction of a working definition. The first similar point is cyberspace. All of the definitions state that virtual communities should be on the net, use computer-mediated spaces, or cyberspace. This point differentiates the virtual community from a physical community. Unlike the traditional definition of “community” that implies the existence of a geographical boundary and its communication bounded by the physical location (F. S. L. Lee et al., 2003). The second aspect in common is the usage of computer-based information technology to support the activities in virtual communities. The third similar aspect is that communication and interaction are the main focus, and content or topics of virtual community are driven by the participants. The participant-driven community, not the web site coordinators, clearly distinguishes the virtual community from online information services, and the contents in the community are formed when members communicate with each other. Among members, recurring interaction generates further messages and makes the communication non-stop for a sustained community. The final shared aspect is the successful virtual community relationship, culminating after a certain time period of communicating together (F. S. L. Lee et al., 2003).

On the basis of these considerations, F.S.L Lee and colleagues suggested a definition of virtual community, summarizing the main points of previous definitions: a virtual community is “a cyberspace supported by computer-based information technology, centered upon communication and interaction of participants to generate member-driven contents, resulting in a relationship being built up” (F. S. L. Lee et al., 2003, p. 174). This definition is complete but in our view, it is primarily focused on technology aspects, leaving little space for social or emotional aspects. For

this reason we preferred to use the definition suggested by Kosonen (2008) in our research. According to the author, a virtual community is generally understood as "a specific form of social organizing, an online network in which people who share an interest in a certain subject interact repeatedly inside certain boundaries, and which relies on communication technologies at least to a certain degree" (Kosonen, 2008, p.24) in which members may also develop affective bonds and express a sense of belonging to the group (Blanchard & Markus, 2004).

1.2.1 Virtual communities classification

Virtual communities may be of many different types. Some are tightly bound, densely knit groups of individuals who know one another well, and use the digital environment primarily as a way of augmenting their existing social relationships (Wellman, 1999). In contrast, others are sparsely connected networks of individuals who come together only in the mediated digital environment and have little chance of meeting physically. Some communities exist for social reasons, such as to enable likeminded individuals to meet; others exist primarily for commercial reasons (Hagel & Armstrong, 1997). Therefore, one characteristic that all virtual communities share is that text-based communication in the digital environment is the primary shaping force for their evolution and growth (Bagozzi & Dholakia, 2002). Rheingold (1991) in the introduction to his book describes the essence of virtual communities: "People in virtual communities use words as screens to exchange pleasantries and argue, engage in intellectual discourse, conduct commerce, exchange knowledge, share emotional support, make plans, brainstorm, gossip, feud, fall in love, find friends and lose them, play games, flirt, create a little high art, and a lot of idle talk". Pictures, animations, or voice may nowadays augment the written word, but text still remains the preferred way for virtual community communication (Bagozzi & Dholakia, 2002).

From a practical point of view, a virtual community provides access for engaging in common activities, sharing feelings, or discussing ideas with others. One current practice is to build

web sites and allow people to register as members who can then share information or feelings virtually (F. S. L. Lee et al., 2003).

According to Hagel and Armstrong (1997) interactions in virtual communities are based on people's desire to meet four basic needs: interest, relationship, fantasy, and transaction. Under this classification, the interest need is targeted in the virtual community by aggregating a dispersed group of people who share an interest and expertise in a specific topic. The relationship need gives people with similar experiences the opportunity to come together and form meaningful personal relationships. The fantasy need provides an opportunity for people to come together and explore new worlds of fantasy and entertainment, while the transaction need is met online through the trading of information among participants.

Jones and Rafaeli (2000) developed Hagel and Armstrong's classification (1997). They focused on three different aspects: "use", "social structure", and "technology." They adopted Hagel and Armstrong's proposal to provide a scheme (interest, relationships, fantasy or transactions) for classifying virtual communities by use, and it can be applied when studying social and psychological issues in virtual communities. The classification by "social structure" requires an analysis of the social networks that are formed by users that are more specific to some particular virtual communities. However, this second classification is unclear because the community type is quite specific and may only fit in one situation but not in others. The classification by technology is a more straightforward one. It classifies virtual communities according to their technological base that encompasses Web-BBS, web avatar meeting place, UseNet group, email list, 3D world, text generated space, Internet chat, and other computer mediated communication technologies. It can be applied when studying the functions and features provided in virtual communites

In summary, none of the classifications of virtual community cover every aspect, or fit under every circumstance. Each categorization scheme fits better in certain situations than in others. For example, when describing something relating to technology, Jones and Rafaeli's classification by technology would be more suitable. However, categorizations of Hagel and Armstrong are more

generic and more related to social issues. A virtual community is not the actual site were people meet, but the people who meet there (Dickinson, 2002). This aspect suggested that there is much more to a virtual community than just the technology behind it. We need to consider communities primarily as human associations in which the members form the center of the community (Dickinson, 2002). Given these considerations, previous classifications of virtual communities could be applied in behavioral studies where participation is voluntary and the outcomes are uncertain (F. S. L. Lee et al., 2003).

1.2.2 Virtual communities: Focusing on the discussion forum

As previously mentioned, the main difference between the first generation of the Web and the Web 2.0 lies in the approach with which users use the media: from a passive consultation of the contents of the web 1.0, to the active contents production that enrich and fill the web of the second generation. The social web consists of a number of online tools and platforms where people share their perspectives, opinions, thoughts and experiences. It is not a simple e-mail consultation, or the use of a search engines, but an interactive participation in online content creation. There is a greater involvement of people who write comments, leave feedback and open personal journals on the Web through renewed services and tools typical of the Web 2.0.

What are the applications of the Web 2.0 by which it is possible to create a community? F. S. L. Lee and colleagues (2003) conducted a survey on Internet tools used in 200 virtual community web sites. Their results indicated that the discussion forum was the most popular virtual community tool. Among the web 2.0 tools, forums are the most popular and widely spread instances, allowing online free content to be accessed by anyone at any time. Discussions and threads in a virtual forum are written by many community members around a specific topic or a family of topics; users' contributions, namely their posting activity, can be commented and replayed by any other community member at any time via the Internet. The goal of a community forum is to

offer a place for discussion but also to make community knowledge available to anyone immediately, and ultimately to benefit the whole community.

Following the web environment taxonomy previously described (see par. 1.1.2 and figure 1), virtual forum presents an asynchronous user participation in the same virtual space. The emergence of virtual communities has enabled knowledge to be exchanged between like-minded individuals in geographically dispersed areas (Fang & Chiu, 2010).

A forum is hierarchical in its structure: it can contain a number of sub-forums and may have several internal topics. Within a forum's topic, each new discussion is called a *thread*, and can be replied to an infinite number of people. Depending on the forum set-up, users can be anonymous or have to register with the forum and then subsequently log in in order to post messages. Usually it is not necessary to log in to read existing messages. Most common topics on forums include questions, comparisons, opinion polls as well as debates among community members.

Analyzing forums that have been active for several years, we can notice that among several threads, members share their experiences and knowledge with all the users who participate in the web community's life. The knowledge sharing process occurs through discussions and interactions among members of the forum. Web-based discussion boards are one of the most common platforms for users to learn from each others (M. K. O. Lee, Cheung, Lim, & Sia, 2006).

1.2.3 Virtual forums as virtual communities of practice

The virtual environment we are interested in for our research is a web community usually built around a virtual forum. This type of community is often referred to as "virtual learning community" (Chen & Chen, 2009), "community of interest" or "virtual community of practice" (Wasko & Faraj, 2005). This kind of communities offers their members an environment for online communication (e.g., Ardichvili, Maurer, Li, Wentling, & Stuedemann, 2006; Fahey, Vasconcelos, & Ellis, 2007; Usoro, Sharratt, Tsui, & Shekhar, 2007). Wenger, McDermont and Snyder (2002) suggested that communities of practice are "groups of people who share a concern, a set of

problems, or a passion about a topic, and who deepen their knowledge and expertise in this area by interacting on an ongoing basis" (p.4).

Virtual communities of practice are information technology based cyberspaces that exist mainly through electronic means such as online forums, bulletin boards, and email, in which groups of geographically dispersed learners accomplish their e-learning goals. Participation in a community of interest can be compelling, entertaining and create a cohesive community where people return frequently and remain for extended periods (Harrower, 2009). Such kinds of communities have increased their initiatives over the past years, mobilizing knowledge via the Internet (Fang & Chiu, 2010).

Some authors adopt the term virtual community of practice to refer to any type of online interaction organized around a shared enthusiasm for a specific activity or group of activities (De Valck et al., 2007).

1.3 Users participation in virtual communities

Today, more and more individuals participate in virtual communities to acquire knowledge and resolve problems (Hsua, Jub, Yenc, & Chang, 2007). Still, some people like to sit back and absorb media contents, reading pages and messages posted on the forum. Others prefer to get involved and to interact. As previously mentioned, most activity in a web community takes the form of posting or viewing opinions, questions, information, and knowledge within the community's message boards (Koh, Kim, Butler, & Bock, 2007). Consequently, posting and viewing contents are fundamental elements in the life of a virtual community. For our research, we consider posting and viewing activity as the two most typical activities of a community of interest, which allow a sense of participation in the life of the community and that facilitate the process of knowledge sharing.

What is the main exchanged good in a virtual community and around which usually a web community develops? All the definitions previously given of virtual community of practice shared

the key concept of knowledge exchange, or knowledge sharing. The most widely recognized benefit of communities of practice is their ability to allow for the generation and dissemination of tacit knowledge, that is, knowledge that is hard to communicate because it is mostly intuitive and embedded in a specific context (Ardichvili, 2008; Nonaka, 1994).

Knowledge is a judgment of the significance of events in a particular context or theory (Bell, 1999; Tsoukas, 2005). Furthermore, the ability to make such judgments is based on the ability to draw distinctions, and on being located within a collectively generated and sustained practice. According to Spender (1996), 'knowing' is fundamentally a social act (Kosonen, 2008). Knowledge sharing presumes a two-way relation between at least two subjects capable of knowing, of which one communicates knowledge either consciously or not, and the other should be able to perceive knowledge expressions and make sense of them. Knowledge sharing thus involves interpretation (Hendriks, 1999). According to Bagozzi and Dholakia (2002), the interaction among the users of a forum is based on the exchange of text messages; text-based communication in a digital environment is the primary form of communication for their evolution and growth. People in virtual communities use words on screens to engage in intellectual discourse, conduct commerce, and exchange knowledge (Bagozzi & Dholakia, 2002).

However, the value of a virtual community is limited without rich and solid knowledge exchange (Bagozzi & Dholakia, 2002). The sharing of knowledge is of vital importance to a virtual community because it enables users to accumulate resources and to foster future growth (Fang & Chiu, 2010). This aspect has long been regarded as a motivation for using virtual communities (Wasko & Faraj, 2005). In a virtual community, knowledge contribution occurs when individuals are motivated to review the posted questions and take their time and effort to reply to a response (C. C. Wang & Cheng, 2006). For Hsua and colleagues (2007) knowledge is viewed as an object that can be accessed and retrieved by members of the virtual community.

To date many studies have highlighted the various factors that affect an individual's willingness to share knowledge, such as costs and benefits, incentive systems, extrinsic and intrinsic

motivation, organization climate, and management championship (Hsua et al., 2007; C. C. Wang & Cheng, 2006). For instance, Fang et al. (2010) suggested that altruism and conscientiousness have significant effects on the members' knowledge-sharing continuance intentions. Their results indicated that participants showing altruistic behaviors were more willing to share knowledge in a virtual community.

While knowledge sharing has been found to be a motivation for using emergent virtual communities (Wasko & Faraj, 2000), a range of barriers has been found impeding online knowledge sharing. Knowledge sharing and participation may be limited by various factors: poor quality of community websites, members' lack of social relationship ties, their lack of capabilities in using community websites, and cognitive processes such as negative attitude toward sharing knowledge online (Chen & Chen, 2009; Malhotra & Galletta, 2004; Sangwan, 2005). Wasko and Faraj (2005) suggested that an individual's structural position in a virtual network would influence his/her willingness to contribute knowledge to others. Given the social characteristic of virtual communities, this study suggests that attitude, self-efficacy, social network ties and subjective norm will collectively shape knowledge sharing behavior.

1.3.1 Virtual forum and User generated contents

The concept of the "participative web" is based on an Internet increasingly influenced by intelligent web services that empower the user to contribute developing, rating, collaborating on and distributing of Internet content (Wunsch-Vincent & Vickery, 2007).

There is no widely accepted definition of what is to be considered *user generated content* (UGC) and measuring its social, cultural and economic impacts is in the early stages. Wunsch-Vincent and Vickery (2007) defined UGC as "content made publicly available over the Internet, which reflects a certain amount of creative effort, and which is created outside of professional routines and practices" (p. 4). All content produced by users on the network (photos, text, video) are

defined as User-generated content. In other words, we may consider the text messages exchanged on a forum, such as a contingent expression of the knowledge sharing process.

Discussion forums belong to the UGC phenomenon and often a web community develops around this artifact. User-generated content "is one of the main features of the so-called participative web" (Wunsch-Vincent & Vickery, 2007; p.4)

Although the measurement of UGC is in its infancy, available data show that broadband users produce and share content at a high rate, and this is particularly high for younger age groups (*e.g.* 50% of Korean Internet users report having a homepage and/or a blog).

On a virtual forum the process of knowledge sharing occurs through the exchange of messages in text form. This has enabled several researchers (e.g., Bagozzi, 2011) to measure participation by analyzing the level of comments left in a forum.

In a virtual forum, comments by other people generate new information and knowledge based on the original content. In particular, social participants of news websites may provide new perspectives to the original news content by commenting and sharing it on other platforms (Volkovich & Kaltenbrunner, 2011).

1.3.2 Participation inequality in virtual communities: the rule of 1-9-90

In the previous sections we described, in general terms, what are the environments of the Internet that offers instruments to give life to a virtual community; we then narrowed the focus, on virtual communities of practice.

Scholars suggest that the main value around which a web community develops is knowledge, shared mainly through written text (Bagozzi & Dholakia, 2002). We also made an early distinction between content producer and content readers. In 2006 Nielsen explored empirically virtual communities, whose growth and development is entrusted by user's contributions and cooperation. The author defined a sort of inequality in the contribution, which is the tendency for most people to participate very little, while only some community members represent the active part

of content production. In social sciences, participation inequality consists in the difference between the level of participation between groups of people in certain activities (Black, 2003).

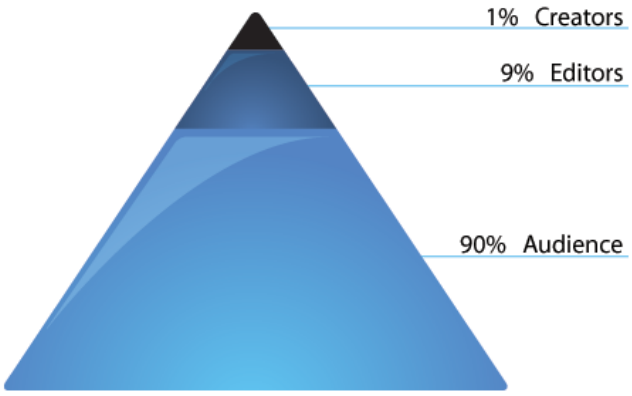

Figure 2. Participation inequality on the web

In his studies Nielsen (2006) found that user participation generally follows a ratio of 1% as active content producers, 9% as content modifiers and 90% of passive readers (Figure 2).

The 1% rule states that the number of people who create content on the Internet represents approximately 1% (or less) of the people actually viewing that content. In general, for one person who intervenes with a new discussion on a forum, there are nine persons that modify or add something to that discussion, and at least ninety other people viewing that discussion on the forum but do not contribute to it. For example, a large 2005 study of radical Jihadist forums by Akil Awan found that 87% of users had never posted on the forums, 13% had posted only once, 5% had posted 50 or more times, and only 1% had posted 500 or more times (Awan, 2007).

1.3.3 Reasons for participation: Different theoretical frameworks

Considering the ever-increasing role of the Internet, it is important for researchers to understand the reasons why audiences use the web. The research question is what motivations lead an individual to invest time and resources in voluntary contributions in a virtual community and what are the dynamics that inhibit this process?

Scholars have tried to explain the motivations that are behind the willingness to contribute to user-generated content, ranging from altruistic to social and to materialistic ones.

Due to the high value of the user generated content, many sites use incentives to encourage participation (Toluna, 2009). These incentives can be generally categorized into explicit and implicit incentives. The latter are not based on anything tangible and social incentives are the most common form of implicit incentives. They allow the user to feel good as an active member of the community. These can include, for instance, personal relationship among users. Other common social incentives are status, badges or levels within the site, something a user earns when they reach a certain level of participation (Toluna, 2009). On the other hand, explicit incentives refer to tangible rewards. Examples include financial payment, entry into a contest, a voucher, a coupon, or frequent traveler miles. Direct explicit incentives are easily understandable by most people and have immediate value regardless of the community size; this reduces the effects of other form of social motivation.

Contribution sometimes implies significant costs for the contributor. These costs include time spent in making the contribution, decrease in value of shared contents due to wider availability, network connection costs, and potential legal liabilities in sharing contents. This combination of low benefits and high costs suggests individuals will provide little contribution to online social networks (Gu, Huang, Duan, & Whinston, 2009)

Thus, referring to the contribution inequality proposed by Nielsen (2006), what are the psychological variables that affect the contribution by limiting 90% of the total users to simply read contents or to take advantage of contributions made by others?

Scholars have tried to identify what the mechanisms of participation online are, using different theoretical approaches. Two main approaches may be identified: the uses and gratifications approach and the group based and social influences approach.

1.3.4 Online participation: Uses and Gratifications approach

The Uses and Gratifications Theory tries to explain why people use a particular kind of media product, and the gratifications they receive from that use (Rafaeli, Ravid, & Soroka, 2004). The theory assumes that users actively seek particular media with the goal of gratifying an existing need. The gratifications obtained by the use of the media, influence the actions they perform in order to achieve particular needs (Rafaeli et al., 2004). Palmgreen and colleagues (Palmgreen, Wenner, & Rayburn II, 1980) distinguishes between two kinds of gratifications: the ones sought by the users and the ones actually obtained from the use of the media. The uses and gratifications approach originally started in the previous century by Herzog (1944), while a more formal definition was expressed later by Katz, Blumler and colleagues (Katz, Blumler, & Gurevitch, 1974; Katz, Gurevitch, & Haas, 1973). The uses and gratifications literature focuses on the ways people use media to gratify their needs, based on the assumption that people are active and goal oriented in their interactions with the media; this theoretical approach emphasizes motives and self-perceived needs of audience members (Lampe, Wash, Velasquez, & Ozkaya, 2010).

Katz and colleagues (1974) concluded in their studies that different people could use the same communication message for very different purposes. The same media content may gratify different needs for different individuals. Therefore, there are as many reasons for using the media as there are media users (Katz et al., 1974; Katz et al., 1973).

Katz et al. (1973) developed 35 needs taken from the social and psychological functions of the mass media and categorized them into five groups: *Cognitive needs*, including acquiring information, knowledge and understanding; *Affective needs*, including emotion, pleasure, feelings; *Personal integrative needs*, including credibility, stability, status; *Social integrative needs*, including interacting with family and friends; and *Tension release needs*, including escape and diversion.

With the onset of the digital age, many researchers continue to make use of this approach in new media studies (e.g. (Katz et al., 1974; Ruggiero, 2000; Sangwan, 2005; Stafford, Stafford, &

Schkade, 2004). recently, Sangwan (2005) suggested the Uses and Gratifications framework to study users' motivations in online communities in order to understand their success. He identified three key motivators for virtual community use: Functional, Emotive and Contextual. These motivators represent various mixtures of needs, but that are essentially related to information acquisition and more for surfing for information for pleasure; Functional needs are related to the quality of the contents; Emotive needs refers to acceptance of relationship building through interaction and communication in virtual environments; contextual needs are related to individual user specific expectations and experiences beyond functional and emotive needs (Sangwan, 2005).

Recently, Rafaeli and colleagues (2009), following the traditional clusters of needs, investigated the motivations for contributing to the Wikipedia web-community. They tried to identify the cognitive and social-integrative needs that serve as motivators for participation in Wikipedia and defined three categories of motives: getting information, sharing information and entertainment. Their data revealed that the strongest motivators for Wikipedia contributors were cognitive (e.g., learning new things and intellectual challenge) and affective (e.g., pleasure) ones.

Dholakia and colleagues (Dholakia et al., 2004) explained motivations for participating in online communities by deriving five motivational factors from the Uses and Gratification theory: *purposive value*, which referred to a predetermined instrumental purpose, for example giving or receiving information; *self-discovery*, which covered aspects of social interaction to obtain resources and self-knowledge; *maintaining interpersonal connectivity* for mantaining contact with other people and gaining social support and friendship; *social enhancement* was tied to the value derived from the status the user has within a community; finally, *entertainment* which was derived from the fun of playing or interacting with other users.

In the last decade, scholars have identified a variety of factors that motivate user contributions to online social networks. Hann and colleagues (2006) categorize the motivations that lead an individual to contribute to a virtual community into extrinsic, intrinsic, and internalized extrinsic factors. Extrinsic factors refer to the incentives provided by external environments. Studies

show that extrinsic incentives play an important role in organizational virtual communities (Gu et al., 2009; Raghu, Jayaraman, & Rao, 2004; Raghu, Rao, & Sen, 2003); extrinsic incentives include for instance, career opportunities (Gu et al., 2009; Hann et al., 2006) or even organizational rewards (Bock et al., 2005)

Intrinsic factors refer to the satisfaction gained from the creation of contents and from the contribution to the social networks, such as fun and joy in solving problems of other members (Hann et al., 2006; Shah, 2006), enjoyment in helping others and knowledge self-efficacy (Wasko & Faraj, 2005). Internalized extrinsic factors refer to extrinsic motivations that are self-regulated instead of directly imposed by external actors or authorities. These motivations include reputation within the community itself (Wasko & Faraj, 2005) social identity and self-esteem (Bagozzi, 2011; Bagozzi & Dholakia, 2002, 2006b), reciprocity (Bock et al., 2005; Shah, 2006; Wasko & Faraj, 2005), fairness (Bock et al., 2005) and use value (Shah, 2006).

The uses and gratification approach can capture the individual motivations of belonging to a community. However, a community also shows a set of social dynamics that this approach cannot explain. For example, in a recent work, Gu and colleagues (2009) analyzed the role of the indirect reciprocity in online communities of peer-to-peer music sharing. They considered indirect reciprocity as a dynamic social force: "An individual's likelihood of contribution changes with the social environment" (Gu et al., 2009). Authors found that individuals increase their contributions when they observe an increase in the number of contributors, and they decrease their contributions when there was an increase in the number of free riders. These results indicate that indirect reciprocity was regulated considering the social environments. How can the uses and gratification approach explain a social process like indirect reciprocity?

In the next chapter we will focus more on the theoretical approach that explores behavior starting from its relationship with attitude. Through a series of considerations it will be possible to extend this approach so that it can capture the social dynamics that arise within a community.

2 CHAPTER 2 - Group based and social influence approach

The behavioral objective of interest for our studies was the online participation, in terms of contribution and use of content in virtual discussion forums. For our studies, we chose to explore online contribution behavior starting from its relationship with attitude and combining it with the philosophical point of view of we-intentions (Searle, 1990) . In order to better explore the factors underlying the behavioral prediction starting from attitude, the Theory of Planned Behavior (TPB) and the Model of Goal Directed Behavior (MGB) and their uses in online communities studies will be widely discussed in the following paragraphs.

2.1 Compatibility between attitudes and behavior

The same attitude may be expressed in a variety of ways. For example, having a positive attitude towards a specific political party does not necessarily mean that a person will actually become a member, or that a person will attend public meetings. But if that person does not vote that specific political party in a general election, people may question her/his attitude. In other words, an attitude should predict behavior to some extent, even if this is extremely limited and specific.

Azjen & Fishbein (2002; 2005) argued that attitudes can predict behavior, but only if both are assessed at the same level of generality (principle of compatibility). They argue that much of the earlier research suffered from either trying to predict specific behaviors from general attitudes, or vice versa, and this accounts for the generally low correlations. According to Ajzen and Fishbein, every single instance of behavior involves four specific elements: a specific *action*, performed with respect to a given *target*, in a given *context*, at a given point in *time*. According to the principle of compatibility, measures of attitude and behavior are compatible to the extent that the target, action, context and time element are assessed at identical levels of generality or specificity (Ajzen, 1988). In 1996, Ajzen suggested that "the extent that the beliefs salient at the time of attitude assessment are also salient when plans are formulated or executed, strong attitude-behavior correlations are expected" (Ajzen, 1996; p.393). For example, a person's attitude towards an online contribution

only specifies the target, leaving the other three unspecified. Many of the classic studies that failed to find an attitude‐behavior relationship assessed just *single instances of behavior* (Stroebe, 2000). Behavior depends on many factors in addition to attitude. This makes a single instance of behavior an unreliable indicator of an attitude and only by sampling many instances of a specific behavior it is possible to reduce the influence of specific factors. This is the *aggregation principle* proposed by Fishbein & Ajzen (Fishbein & Ajzen, 1975). What has emerged in the 1980s and 1990s was that attitudes and behavior are not related in a simple one-to-one relationship. In order to predict someone's behavior, it must be possible to account for the interaction between attitudes, beliefs and behavioral intentions, as well as how all of these connect with the action. In the literature on the prediction of online behavior, the theory of planned behavior and the model of goal directed behavior have often been used (Bagozzi, 2011; Bagozzi & Dholakia, 2002, 2006b; Bagozzi, Dholakia, & Mookerjee, 2006; Benham & Raymond, 1996; Dholakia & Bagozzi, 2004; Dholakia et al., 2004; Hung, Ku, & Chang, 2003). For this reason in the following paragraphs we will describe in details these two theoretical frames.

2.2 The Theory of Planned Behavior

The Theroy of Planned Behavor (TPB; Ajzen, 1985; Ajzen, 1991) has been one of the most influential theories in explaining and predicting behavior, and it has been shown to predict a wide range of behaviors (Sheppard, Hartwick, & Warshaw, 1988) .The TPB (see Figure 3) is an extension of the Theory of Reasoned Action (TRA; Ajzen & Fishbein, 1980) that incorporates non-volitional elements for predicting behavior. As in TRA, the antecedents to behavior prediction are the behavioral intentions to act, the relationships among attitude, subjective norm and behavioral intentions. By adding a control variable though, TPB expands the boundary conditions to behavior not completely under an actor's volition. To enhance the prediction of intention and behavior, TPB introduce the construct of perceived behavioral control (PBC) that is the person's belief about how easy or difficult it will be to perform a behavior (Ajzen, 1985). As in the TRA model, attitude

toward behavior reflects one's favorable/unfavorable feelings of performing a behavior. Subjective norm reflects one's perception of relevant others' opinions on whether or not he or she should perform a particular behavior. Perceived behavioral control reflects one's perceptions of the availability of resources or opportunities necessary for performing a behavior (Ajzen & Madden, 1986; Netemeyer, Andrews, & Durvasula, 1993).

The TPB framework tries to explain the way in which goals and plans guide behavior, and the factors that induce people to change their intentions, or prevent successful execution of the action. In the TPB, every intended behavior is a goal, whose attainment is subject to some degree of uncertainty. This concept can be referred to as a *behavior-goal* unit and the *intention* constitutes a plan of action in achieving the behavioral goal (Ajzen, 1985; Ajzen, 1991).

The TPB, introduced the distinction between a goal intention, for example an ultimate accomplishment such as losing 10 kg, and a behavioral intention, for example taking a diet pill. As theorized in the TPB, many factors can obstruct the intention-behavior relation: a person will attempt to perform a behavior if he/she believes that the advantages of success outweigh the disadvantages of failure related to performing the action. This individual will be successful if he has sufficient control over internal and external factors that, in addition to effort, also influence the behavioral goal success.

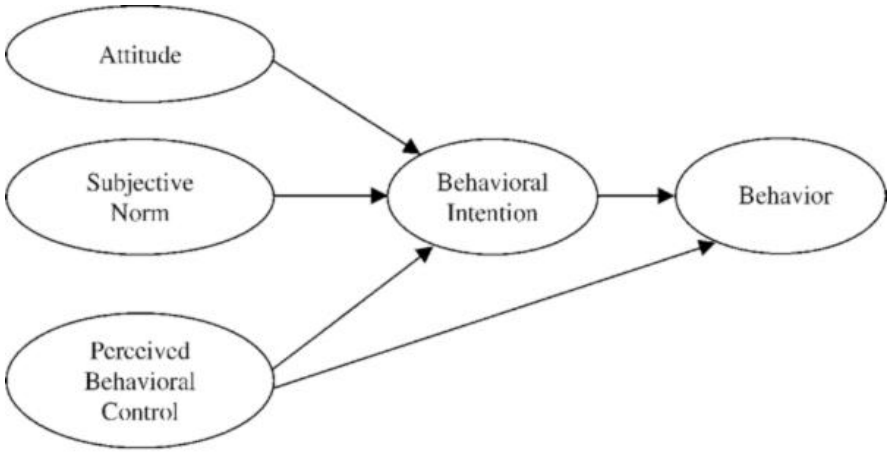

Figure 3. Theory of planned behavior theoretical model

The central equations of the TPB considers the possibility of a direct effect from the *perceived behavioral control* (PBC) to behavior as well as an effect via *behavioral intentions* (BI) and *attitude* (Att), *subjective norm* (SN) and perceived behavioral control are the proximal antecedents of behavioral intention to act :

$$\textbf{Behavior} \sim \textbf{BI}(w_1) + \textbf{PBC}(w_2) \quad (1)$$

$$\textbf{BI} = \textbf{Att}(w_1) + \textbf{SN}(w_2) + \textbf{PBC}(w_3) \quad (2)$$

where w_is are empirically determined regression weights.

From a philosophical point of view, as expressed by Searle (1983) an action is "a causal and intentional transaction between mind and the world" (p.88). Ajzen (1991) described that intentions are “assumed to capture motivational factors that influence a behavior” (p.181) and can also be a measure of how much effort someone is willing to exert when performing a behavior. Moreover, he defined intentions as behavioral plans, which allow the attainment of a behavioral goal in presence of the appropriates resources (Ajzen, 1991). The behavioral intention is a mental and causal component that represents conditions of satisfaction to be met by the actual behavior.

In the descriptive equations of the model, attitude toward the behavior and subjective norm are function of indirect measures or determinants of the respective constructs. Attitudes are determined by behavioral beliefs, namely the perceived consequences of the action, and the evaluation of the outcomes of the action. According to the model, people's attitudes toward behavior or their evaluation of the behavior are determined by their accessible beliefs about that, where a belief is defined as the subjective probability that the behavior will produce a certain outcome. Specifically, the evaluation of each outcome contributes to the attitude in direct proportion to the person's subjective possibility that the behavior produces the outcome in question (Fishbein & Ajzen, 1975). We can describe the relation between attitude and behavior with the following equation:

$$\mathbf{Att_B} \approx \sum_{i=1}^{n} BiEi$$

Where Att_B represents attitude toward behavior; Bi represents the subjective likelihood that action will lead to the consequences *i*; *Ei* is te evaluation of the consequence *i*; *n* is the number of salient beliefs. Therefore, it is not stated that people perform all this calculation before performing a specific behavior. Fishbein (1993) clearly affirmed that the previous equation does not represent a process but it is aimed ad depicting a computational representation of the output of such process, which is automatic and function of learning.

The concept of social influence has been assessed by social norm and normative belief. Its determinants are normative beliefs and individuals' elaborative thoughts on subjective norms are perceptions on whether they are expected by their friends, family and the society to perform the recommended behavior. The relation con be stated as follows:

$$\mathbf{SN} \approx \sum_{j=1}^{r} BjMj$$

Where *Bj* represents the normative belief that the referent *j* would or would not approve of the performance of the action; *Mj* is the motivation to comply to the referent's *j* expectation; *r* is the number of salient referents.

Ajzen and Madden (1986) suggested that even the most commonplace behavior is subject to the influence of factors beyond one's control. From this perspective, TPB posits that most intentional behaviors are those whose attainment is subject to some degree of uncertainty, and the chance of success of that specific behavior not only relies on intention, but also on factors that may interfere with behavioral control (e.g. time, opportunity and the cooperation of others). The concept of perceived behavioral control originates from the self-efficacy theory proposed by Bandura (1977). The author separated expectations into two distinct types: self-efficacy and outcome expectancy (Bandura, 1977, 1986, 1997). He defined self-efficacy as the conviction that one can successfully execute the behavior required to produce the outcomes. The outcome expectancy refers

to a person's estimation that a given behavior will lead to certain outcomes. He stated that self-efficacy is the most important precondition for behavioral change, since it determines the initiation of coping behavior. More recently Bandura (1997) suggested that self-efficacy is one of the major cognitive forces guiding behavior.

In the TPB, the construct of perceived behavioral control is defined as the perceived ease or difficulty of performing the particular behavior (Ajzen, 2002). Ajzen also suggested another variable, control beliefs, which lead to perceived behavioral control. They refer to beliefs about factors that may facilitate or impede performance of the behavior (Ajzen, 2002). Assuming this, the concept of perceived behavioral control is in general measured by self-efficacy and controllability (Ajzen, 2002); self-efficacy is defined as individual judgments of a person's capabilities to perform a behavior while controllability is defined as individual judgments about the availability of resources and opportunities to perform the behavior.

Specifically, the strength of each control belief *C* is weighted by the perceived power *P* of the control factor, and the products are aggregated for the number of beliefs *i*, as shown in the following equation.

$$\mathbf{PBC} \approx \sum_{i=1}^{k} CiPi$$

In particular, perceived behavioral control is presumed to not only affect actual behavior directly, but also to indirectly affect it through behavioral intention. Given a sufficient degree of actual control over the behavior, people are expected to carry out their intentions when the opportunity arises (Ajzen, 2002).

Armitage and Conner (2001) proposed a meta-analytic review of the TBP providing strong evidence of the TPB for predicting intention and behavior. In their analysis there was some evidence for discriminant validity between intention and self-prediction, and for the distinction between self-efficacy and perceived control over behavior. Finally, subjective norm showed a strong relationship with intention when appropriately measured while behavioral intentions, may

explain an important portion of variance in actual behavior. In a review of nine meta-analyses and quantitative reviews of the the TPB, Sutton (1998) concluded that attitudes, subjective norms, and PBC account for 40% to 50% of the variance in behavioral intentions.

Several studies found empirical evidence that the TPB would better help to predict health-related behavioral intention than the TRA (Ajzen, 1988) given that the TPB has improved the predictability of intention in various health-related fields such as condom use (Albarracin, Fishbein, Johnson, & Muellerieile, 2001), exercise (Nguyen, Potvin, & Otis, 1997) and diet (Conner, Kirk, Cade, & Barrett, 2003).

Referring to the Internet, Chen, Chen and Kinshuk (2009) attempted to examine the factors influencing knowledge sharing from the perspective of human behavior. They used the TPB (Ajzen, 1991) expanding it with additional variables like social network ties, while Hsu and Lu (2007) analyzed the consumer behavior in online game communities, suggesting that in their study it was influenced by perceived enjoyment and social norms. TPB has also been successfully used to explain the adoption of voice-mail technology (Benham & Raymond, 1996) and mobile internet services (Hung et al., 2003).

2.3 The Model of Goal Directed Behavior

Theory of Planned Behavior leaves unresolved an important conceptual problem, namely the explanation of the manner in which a person reaches the control on the processes needed to act in a specific situation. Various researchers recognize that attitude theory fails to consider how decisions become energized (e.g., Bagozzi 1992; Fazio 1995). In modern theories of attitude a limited applicability and lack of consideration for motivational processes have been highlighted (Bagozzi, Moore & Leone, 2004). In particular, the most highlighted aspects for the TPB is the vagueness about the link between intentions and attitudes (Moghaddam, Ditto & Taylor, 1990), and between subjective norm and behavior (Bagozzi & Lee, 2002). A positive attitude does not always and inevitably lead to the formation of an intention; indeed we can easely think of many situations

where the individual has the opportunity to act but he/she perceives a lack of ability in the action performance, or even the action itself is evaluated to be harmful. These direct determinants of intentions provide reasons for acting but do not necessarily incorporate the motivational content needed to induce an intention to act. The TPB lacks a "bridge " that links a mental process like the intentions to a physical process represented by the actual action; motivational and conative processes should take place between the formation of an intention and the time when an action is performed (Perugini & Bagozzi, 2001).

The model of goal directed behavior (MGB; Figure 4) has been developed to cope with those aspects of indeterminacy and to deepen the relationship between attitudes, subjective norms, intentions and behavior (Perugini & Bagozzi, 2001).

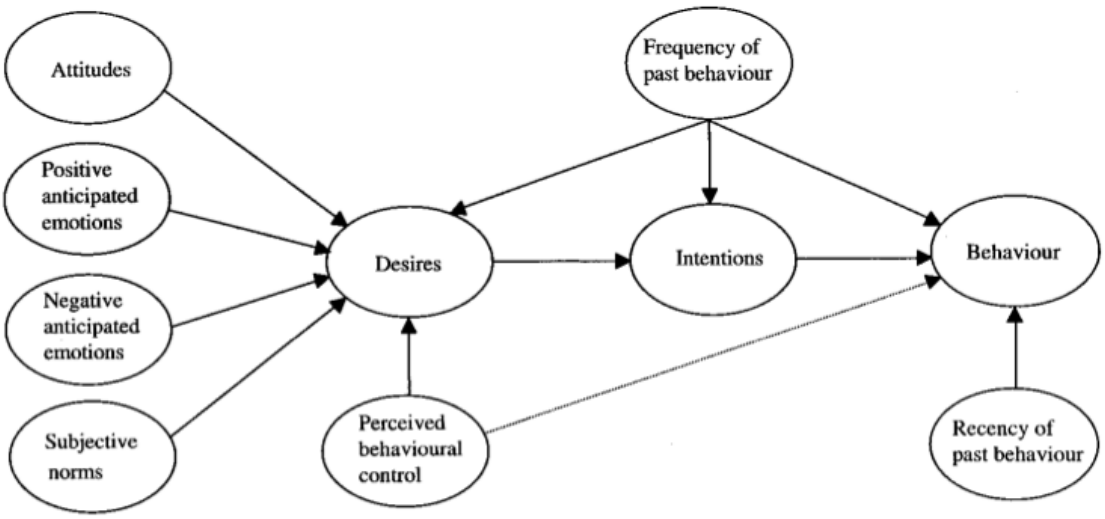

Figure 4. Theoretical model for goal directed behavior

Perugini and Conner (2000) argued that "most behaviors are functional to the achievement of an overarching goal" (p.705). In other words, the goal exercises a dominating influence over the behaviors. For this reason, the MGB subsumes the TPB and improves its predictive and explanatory power (Perugini & Bagozzi, 2001).

Starting from the basic structure of the TPB, Perugini and Bagozzi (2001) improved three aspects of the TPB: automatic, affective and motivational processes. The MGB is characterized by

the introduction of conative and emotional self-regulation processes in the explanation of the relationship between attitude, subjective norms and intentions. As indicated by its name, MGB attributes behavior and behavioral intention to a particular goal (Perugini & Bagozzi, 2001; Perugini & Conner, 2000). MGB postulates that volitional behavior is determined by both behavioral volition and frequency of past behavior. The process that leads to the formation of an intention is completed with the introduction of a new motivational variable: the desire to act (Perugini & Bagozzi, 2004).The MGB posits that desires provide a direct impetus for intentions and transform motivational content into action. The desire to achieve a goal or to perform an action, assuming that a person is able to do so, means a much stronger motivational commitment than only a positive attitude. This provides the necessary impetus to act (Dholakia, Gopinath, & Bagozzi, 2005).

Moreover, MGB explicitly refers to the role of goal-directed emotions that people experience when they consider the prospects of succeeding and failing to act. The emotional factor in the attitude-intention relationship is represented by the following causal path:

Appraisal → Emotional response → Coping

Intentions to perform an act emerge only when the assessments of the consequences of acting are strong enough to form an intention; these emotional processes also determine the strength of the evaluation. They in turn, induce the process of coping responses, cognitive strategies that contribute to the formation of intentions.

Desire, attitudes and norms toward achieving the goal plus positive and negative anticipated emotions associated with goal achievement or failure, are the major antecedents to behavioral intention and than to the realization of the actual behavior. Past behavior, which is introduced as a "proxy of habit" (Perugini & Conner, 2000), provides strengthening for the willingness to act. Driven by this force, subsequent behaviors become operants in certain environmental conditions and with certain frequencies.

2.3.1 MGB: The role of anticipated emotions

Anticipated emotions toward the behavioral goal play an important role in the MGB. Perugini and Bagozzi (2001) argued that the emotional component of attitudes and the anticipated emotions are different concepts. An attitude is typically constant over a period of time and is not necessarily a response contingent on the occurrence of a particular happening. It is an evaluative response towards an object or act that, once learned, is triggered automatically when a person is exposed to the object or act or thinks about it (Fazio, 1995).

The process behind anticipated emotion toward an act is more dynamic and involves self-regulation in response to feedback (Bagozzi, 1992, 2011; Perugini & Bagozzi, 2001). The process of emotional response assumes that one person first has a goal, then appraises the consequences of achieving or not achieving that goal: it is in this phase that corresponding positive and negative emotions arise. The proposed functioning of anticipated emotion is specifically contingent on one's appraisal of goal achievement or goal failure, which changes from time to time, depending on the context.

Gleicher et al. (1995) further propose that counterfactual thoughts develop in relation to imagined events and their alternatives, so that the thought processes produce imagined, affective consequences of goal attainment and goal failure. Through this process, the person decides whether to form a desire and then develops an intention to act. The authors suggested that positive emotions result when a participant engages in pre-factual appraisals in which he/she imagines successful aspects of the upcoming experience, but negative emotions follow from pre-factual appraisals of failure. (Bagozzi, Baumgartner, Pieters, & Zeelenberg, 2000) argue that people, when considering whether to act or not in goal-directed situations, take into account the emotional consequences of both enacting and not enacting that behavior. These emotional processes in turn may be predicated on a type of thought process, akin to counterfactual thinking (Perugini and Bagozzi 2001).

For instance, Bagozzi and Dholakia (2002) discovered that positive anticipated emotions influenced the desire to participate in virtual communities (chat rooms), and Bagozzi et al. (2006)

found that both positive and negative emotions influenced the desire to participate in (small-group- and network-based) virtual communities.

2.3.2 MGB: The role of desire

Desires represent the motivational state of mind wherein appraisals and reasons to act are transformed into a motivation to do so; they refer to the state of mind in which an agent has a personal motivation to perform an action (Perugini & Bagozzi, 2004) depending on how strongly that decision maker wants to enact a specific goal-directed behavior.

Drawing on a philosophical base, Bagozzi (1992) suggested that desires have a particular kind of relationship to intentions: once a person is aware of and accepts his/her desire to act, this will motivate him/her to form an intention. The author also suggests that desires can provide a motivational impetus and perform transformative functions for the antecedents of decision making. Reasoning on an ontological level, desires are subjective and exist only when experienced by a person; they lead to behavioral intentions since they are directed toward the target and action involving that target (Perugini & Bagozzi, 2004)

In the MGB, the target behavior is instrumental to goal achievement. Thus, "the specification of desire is relative to the performance of a given behavior (e.g. dieting) because it is conducive to goal attainment (e.g. body-weight regulation)" (Perugini & Bagozzi, 2001). Recent empirical work appears to support this view and indicates that implementation desires mediate and transform the effects of reasons and motives for acting, as well as influence intentions to act (Bagozzi, 2011; Bagozzi & Dholakia, 2002, 2006a, 2006b; Dholakia et al., 2004; Perugini & Bagozzi, 2004; Shen, Cheung, Lee, & Wang, 2007).

2.3.3 MGB: The role and the components of past behavior

The theoretical framework of the MGB introduced past behavior as a direct predictor of the actual behavior. The authors proposed two processes through which it influences future behavior, distinguishing the effects of frequency and recency of past behavior (Perugini & Bagozzi,

2001). The two dimensions are conceptually distinct and carry independent information. Authors argued that a person may have a long history of performing a given behavior without having performed it recently, or one may have recently taken up an activity with no prior experience with it. There is ample evidence indicating that behaviors repeated frequently during the past tend to become automatic (Aarts & Dijksterhuis, 2000). When one behavior is practiced constantly, the frequency of past performances reflects the habit strength and has therefore a direct effect on future behavior. However, when behavior is not well learned, frequency of past behavior contributes directly to intentions because people tend to form favorable intentions about acts they have frequently performed in the past (Perugini & Bagozzi, 2001). Perugini and Bagozzi (2001) suggested that the direct relation between past and future action shows that people simply do things because they are used to doing them. Bentler and Speckart (1979) stated that some actions become habitual over time and, importantly, that they can be started without mediation of attitudes or intentions or as products of reasoning processes. Therefore, actual behavior is determined by past behavior not mediated by attitudes, intentions, or other concepts referring to deliberate or conscious processes.

Still, the recency of past behavior should influence future behavior by the availability of information regarding such a behavior that has been performed recently. The recent initiation of an activity may carry implicit information about intentions that prompted that particular action (Perugini & Bagozzi, 2001; Tversky & Kahneman, 1974). Recency may serve as an indirect indicator that an intention has been activated and therefore be positively associated with subsequent performance of the behavior.

2.3.4 Empirical evidence of the MGB validity

Several studies used the MGB framework to understand and deepen the desire-intention-behavior relationship. The empirical results of studies demonstrated the validity of the theoretical model. The model was initially tested in two studies by Perugini and Bagozzi (2001). In their work they

described a first study on the regulation of body weight and a second study of dedication to study as behavioral goals. Their results showed that desire fully mediated the effects of attitudes, subjective norms, perceived behavioral control and anticipated emotions on intentions. The authors also showed that a greater amount of variance was explained in intentions and behavior by the MGB in comparison to the TPB.

To analyze the difference in the prediction power between the TPB and the MGB, Leone, Perugini and Ercolani (2006) assessed measures for both the theoretical models. They focused on two goal-related instrumental behaviors: studying a software user's handbooks versus practicing with the related software package during a course of statistics. Results showed that the MGB accounts for a greater proportion of variance in intentions and behaviors than the TPB and desire mediate most of the effects of other predictors on intentions.

The MGB can be easily used in studies of purchase behavioral prediction and customer identification with the brand. Thus, Bagozzi and Dholakia (2006a) used the MGB theoretical framework to investigate the determinants of the behavior of a small group of brand community participants. Their results supported the link between desire and intentions. Attitudes, anticipated emotions and subjective norms positively predicted the construct of desire. Participation in a brand community is very similar to the participation in a virtual community. Both the communities are not geographically defined. Accordingly, several authors tested the MGB in online settings. In these studies the effects of attitudes on desire have been mixed, with some studies showing no effect (e.g., Bagozzi & Dholakia, 2002), and some others revealing an effect of attitude for small-group-based, but not network-based, virtual communities (Bagozzi, Dholakia, & Mookerjee, 2006). Perceived behavioral control has been found to mix effects in these studies. Bagozzi and Dholakia (2002) discovered no effects for perceived behavioral control on either desires or intentions. Dholakia et al. (2004) revealed that perceived behavioral control influenced desires for network-based virtual communities but not small-group based virtual communities. They also found that perceived behavioral control had direct effects on intentions for both network-based and small-group based

virtual communities. Authors showed that perceived behavioral control influences intentions to participate in collaborative browsing but not in chatting activity for Americans, while it influenced intentions to participate in chat-rooms for Indians. The role of past behavior and subjective norm provided in the MGB theoretical framework has never been shown to be significant in studies applied to virtual communities (see Bagozzi, 2011; Bagozzi & Dholakia, 2006b; Bagozzi, Dholakia, & Mookerjee, 2006; Bagozzi, Dholakia, & Pearo, 2006).

2.4 Collective intentions: We-intentions to act

In everyday life and common language, we often use social or collective concepts, as in the following examples: a team celebrates a victory, a group of friends plans to go on vacation together, so that the intentions explicitly refer to the collective group, rather than the singular "self". This reflects the idea of a shared consciousness that motivates social interactions. We commonly report or express such shared intentions by speaking about what we intend or what we are going to do or are doing. Despite this common use, the concept of collective intentions in literature has been studied more in philosophy than in social science. Philosophers firmly establish the logical foundations for such group-based intentions (Bratman, 1993; Gilbert, 1989; Searle, 1990; Tuomela, 1995)

Gilbert (1989) suggested that "we" can mean the self and one or more others "that share in the action of a verb." Volitionally, we may equate a plural subject with "the concepts of a pool or sum of wills, dedicated, as one, to a certain 'cause'," e.g., promotion of a group goal (p.402). Then, "our wanting x is a reason for me to exercise my will in order to get X" (p.402).

Searle (2001) applied the rules for analyzing individual intentions also to the investigation of collective intentions. The philosopher expressed the collective intentionality with the statement "we intend". From an external viewpoint, the behavioral result is equal; the difference resides in a mental component. Moreover, Searle argues that what lies at the heart of a collective action is the presence in the mind of each participant of a "we-intention". Searle does not give an account of we-

intentions or, as he also puts it, "collective intentionality", but stresses the idea that they are distinct concept from the "I-intentions" that animate the actions of persons acting alone.

Bratman (1993) suggested that in the case of shared intentions an individual in a group action see each of the participants, including him/herself, as participating, intentional agent. Starting from this point of view, the author proposed a rational reconstruction of what it is for a group of people to do something together:

Assuming J as the joint action, “We intend to J” if and only if:

1. *(a)*I intend that we J and *(b)*you intend that we J

2. I intend that we J because of 1*a* and 1*b*; you intend that we J because of 1*a* and 1*b*

3. 1 and 2 are common knowledge between us.

In shared intentions the constitutive intentions of the individuals are interlocking, every agent has an intention in favor of the efficacy of an intention of the other. Therefore, intention makes an implicit reference to the subject that fulfills the intentions and then there are no intentions with common content. Bratman (1999) workedaround this problem by introducing the notion of *intending that (*e.g., “I intend that we J”). This formulation does not require that the individual with the intention is also the individual who fulfills the intentions.

Tuomela’s analysis overlaps Gilbert’s perspective of we-intentions. Tuomela (1995) defines a we-intention as a commitment of an individual to participate in joint action that involves an implicit or explicit agreement between the participants to engage in that joint action. Tuomela specified this definition by arguing that each member of the group intends to do his part of the joint action. Under this light, we-intentions entail both commitment to carry out one’s own part in group goal pursuit and commitment to offering mutual support in order to further the behavior. That means that group members are expected to help each other. Tuomela identified four presumptions for we-intention to occur: (1) a member of a collectivity intends to perform his or her own part contributory to the group action; (2) each member believes that the joint action opportunities, to some extent, exist and other members will perform their parts, in addition, (3) there is a mutual

belief among all the participants that the opportunities for joint action will obtain, and finally, (4) the intention to perform one's own part depends on the fact that other members will perform their parts and that there is a mutual belief among all the members. In addition, Tuomela suggested that the beliefs required for we-intention are purely subjective and represent one's own perception of the reality (Tuomela, 1995, 2005).

2.4.1 MGB and we-intentions: Antecedents and consequences

Philosophers have understandably not been concerned with operationalizing collective intentions and developing hypotheses for empirically testing the relationships of collective intentions to antecedents and consequences.

I-intentions and We-intentions to carry out a group act are considered functions of two different groups of influencing variables: individual reasons (e.g., attitude, desire, emotions and control) and social influences to perform a group act (Bagozzi & Dholakia, 2002). To explain the role of social influence on we-intentions to act, Bagozzi and Dholakia used the processes of compliance, internalization and identification proposed by Kelman (1974).

Kelman (1974) calls the influence of felt expectations from other people (e.g., subjective norm) based on a need for approval with the term "compliance" and regards it as an important form of interpersonal influence. Subjective norms are typically operationalized in terms of this felt influence in a rather general sense by specifying "other people whose opinions are important to me" as the source of expectations (Ajzen, 1991). For an individual, such "other people" could also mean members of primary reference groups, and not simply significant others.

In Kelman's viewpoint, a second type of social influence is internalization that is the process by which people make a choice according to the congruence of their own values with the values of another. Nevertheless, most virtual communities are characterized by little or no opportunities for direct mediation of rewards or punishments, low barriers to exit from the community, and generally inconspicuous participation in the sense that the ability to monitor other

people's compliance is relatively low. As a consequence, subjective normative pressure from other members of the virtual community has generally been found to be absent (Bagozzi & Dholakia, 2002; Bagozzi, Dholakia, & Mookerjee, 2005), or modest (Dholakia et al., 2004). Bagozzi and Dholakia (2002), proposed to use the construct of group norms in order to capture the role internalization in the social influence process. Group norms consist of shared values or goals among community members with respect to common expectations of group members' conduct and is internalized as a function of developmental processes, socialization, and role modeling (Bagozzi & Lee, 2002). Group norms have been found to influence collective intentions to participate in the virtual community directly and indirectly through desires (Bagozzi, Dholakia, & Pearo, 2006; Dholakia et al., 2004). In addition, group norms have been found to influence social identity with one's virtual community (Dholakia et al., 2004).

Kelman (1974) also suggested a third type of social influence that is identification with the group. Social identity (Tajfel, 1981; Tajfel & Turner, 1979) captures the main aspects of a user's identification with a group or community; a person sees himself as a member of the community. In the social identity perspective, people need to belong to groups that increase their self-esteem. The satisfaction of the need for self-esteem produces a stronger self-definition in terms of prototypical group attributes, a more positive evaluation of one's own group membership and stronger positive emotions toward the ingroup. Social identity in the virtual community has been found to strongly influence the desire to participate in network and small-group-based communities (Bagozzi & Dholakia, 2002; Bagozzi, Dholakia, & Pearo, 2006; Dholakia et al., 2004) but not in collaborative browsing groups (Bagozzi, Dholakia, & Mookerjee, 2006)

Bagozzi and colleagues employed a social psychological perspective and draw on the model of goal-directed behavior (Perugini & Bagozzi 2001). Their proposed framework incorporates ideas from social identity theory and the philosophy of collective intentionality, which actually are not part of the MGB, to develop a better understanding of the cognitive, emotional, and

social drivers of group actions. The model that resulted from the union between the MGB and social influence dimension is shown in Figure 5.

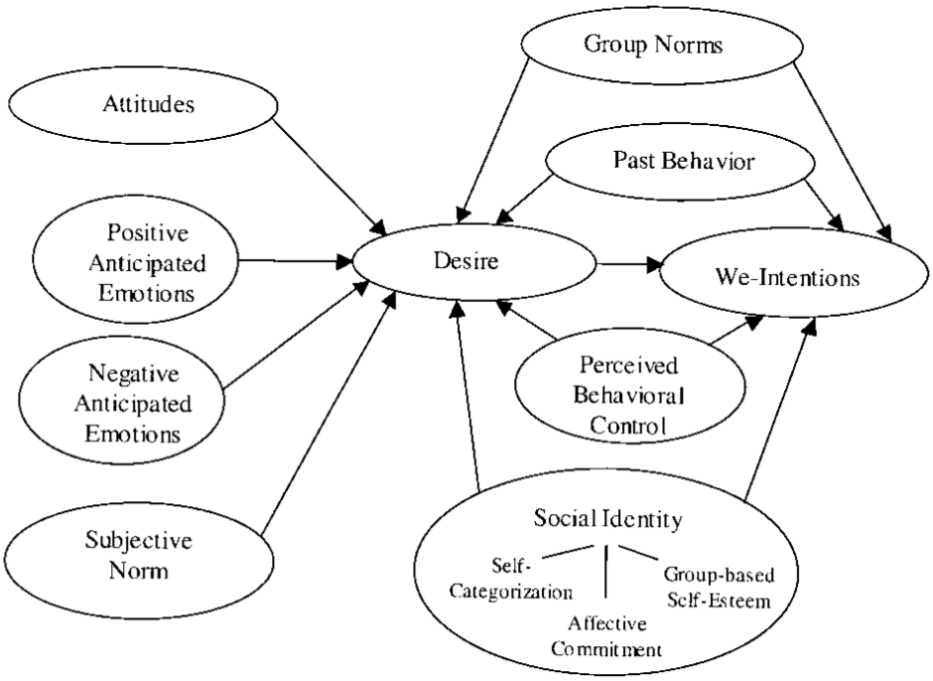

Figure 5. The model of goal directed behavior plus social determinants (adapted from Bagozzi and Dholakia, 2002)

As suggested in several works (Bagozzi, 2000; Bagozzi & Dholakia, 2002, 2006a, 2006b; Dholakia & Bagozzi, 2004; Dholakia et al., 2004) group members' intentions could, in some sense, be considered as something social. In the social sciences, Bagozzi (2006, p.16) argues that "A we-intention is a collective intention rooted in a person's self-conception as a member of a particular group (e.g., an organization) or social category (e.g., one's gender, one's ethnicity), and action is conceived as either the group acting or the person acting as an agent of, or with, the group." Bagozzi and Lee (2002) suggest that this we-perspective intention may exist in two closely related versions: the shared we-intention, expressed in the format, "I intend that our group/we act," and the communal we-intention, framed as, "We (i.e., I and the group to which I belong) intend to act."

2.4.2 Collective intentions in virtual community participants

Virtual communities are mediated social spaces in the online environment that allow collections of people to form and be sustained through ongoing communication processes. Two kinds of virtual communities are the network-based and small-group-based virtual communities (Dholakia, Bagozzi & Pearo, 2006). The former is a specialized, geographically dispersed virtual community based on a structured, relatively sparse and dynamic pattern of relationships among participants sharing a common focus. Common examples include e-mail lists, web site bulletin boards, and Usenet newsgroups. Members of network-based virtual communities typically view the community in terms of venue and only superficially identify with particular individuals within the community.

The small-group based virtual community is a handful or so of persons with a close network of relationships, interacting together online in order to accomplish a wide range of jointly-conceived goals and to maintain the functioning of the group. Common instances of such communities are real-time, online-chat systems, chat-rooms, multi-player virtual games, and multiuser domains. Members of small-group-based virtual communities typically engage often and intensely with the same specific individuals whom they know by name and to a certain extent personally, and they may even on occasion also meet face-to-face in certain communities.

Many behaviors involved in virtual communities are described by their actors through the use of collective concepts, based on a strong sense of "we-ness", Bagozzi et al. (2011; 2002, 2006b) and Dholakia (Dholakia & Bagozzi, 2004; Dholakia et al., 2004) studied the participation of individuals in online social interactions to understand both the role of individual and social influences in attracting members to a virtual community. The authors tested the hypotheses implied by the MGB in the context of virtual community participation and extended it to apply to group behavior in order to explicate the individual and social variables that shape the member's we-intentions to participate in virtual community interaction. A first revision introduced by the researchers to the theoretical framework concerned the manner in which the intentions of

participants were characterized. They proposed that online social interactions may be construed as an "intentional social action" from the participants point of view (Bagozzi, 2000). They conceptualize members' contribution intention as group-oriented, because members tend to consider "themselves as part of the social fabric of the virtual community" (Bagozzi & Dholakia, 2002, p.7). From the members' perspective, the community gives them reasons to think and act in certain ways; for example, the community's constitutive goals, values, and beliefs might determine the group reasons for action (Tuomela, 2007; p.7). On the basis of this idea, Bagozzi and colleagues characterized member's intentions to participate as a collective intentions or "we- intentions" to act as a group jointly (Tuomela, 1995, 2005; Tuomela & Miller, 1987) instead of the commonly studied intentions to act individually. For instance, Bagozzi and Dholakia (2002) used two measures of collective intentions, which they termed "we-intentions," in their investigation of virtual chat room participation: "We (i.e., I and the group of online friends that I regularly chat with) intend to chat in the virtual chat room together sometime during the next two weeks" and "I intend that our group (i.e., I and the group of online friends that I regularly chat with) chat in the virtual chat room together sometime during the next two weeks."

Bagozzi (2011) suggested that in a virtual environment such joint action is not necessarily synchronous; members can perform their respective parts at different times. Researchers found evidence that joint actions entail coordinated endeavors among group members and, therefore, that we-intentions constitute an immediate determinant of online contribution behavior (Bagozzi, 2011).

In sum, collective intentions capture a central aspect of purposive social interactions in virtual communities. Members of the community see themselves as either (a) acting as an agent of the group or as an intrinsic part of the whole group which itself acts or (b) acting as a person contributing individually to a group goal or action. We turn now to an analysis of the antecedents of collective intentions.

3 CHAPTER 3 – Holding back internet contribution

3.1 Introduction

In 2006 Nielsen empirically explored virtual communities, whose growth and development is entrusted by user's contributions and cooperation. The author defined the idea of inequality in online contribution as the tendency for most people to participate very little, while only some community members represent the active part in the content production of a virtual community. In his studies Nielsen found that users, in terms of participation, generally followed a ratio of 1% as active content producers, 9% as content modifiers and 90% as passive readers.

Knowledge can be considered the main resource exchanged in online communities, and it represents the quality of a public good that can be consumed by anyone (Wiertz & de Ruyter, 2007). Therefore for active contribution, we considered it as a process of knowledge sharing that refers to the provision of task information and know-how to help and to collaborate with others to solve problems and develop new ideas (Cummings, 2004). As described in Chapter 1, virtual communities offer a new way for knowledge exchange. Online communities can enhance the collective action of knowledge contribution, as suggested in several studies (Von Hippel & Von Krogh, 2003; S. Wang & Noe, 2010). In literature, all information is considered knowledge (Wang & Noe, 2010) but knowledge is more than just information: it includes information and know-how. Others consider information to be just "a flow of messages" whereas knowledge is based on information. Following these definitions, we found it interesting to consider a web community in which there were both a free flow of messages and also some structured information. We chose therefore a "topic oriented" community, organized around a virtual forum.

The main purpose of this first study was to investigate the spontaneous cooperation on the web as a collective action of knowledge contribution, entering into the interactions of the members of a virtual community. Our focus was to understand why approximately 90% of virtual community members do not actively support the processes of knowledge creation. Our goal was to identify a model suggesting what lead people to participate in a virtual community, whose existence is based

on the exchange of knowledge and cooperation among users (Bressler & Grantham, 2000; Rothaermel & Sugiyama, 2001), but ultimately they do not contribute to its contents, becoming in fact only readers. Some virtual community participants choose to get knowledge from the virtual communities but do not, in turn, actively contribute (Wang & Noe, 2010).

We chose the theoretical framework of the MGB (Perugini & Bagozzi, 2001) in order to investigate the contribution behavior in a virtual community, attempting to improve current understanding of member's participation. Our proposed framework also incorporates ideas from the social identity theory and the philosophy of collective intentionality. For this reason we chose to measure the we-intentions to act which are not part of the MGB, but they are used in many studies to develop a better understanding of the cognitive, emotional, and social drivers of contribution behavior (Bagozzi & Dholakia, 2006a, 2006b; Bagozzi, Dholakia, & Pearo, 2006; Dholakia et al., 2004).

In line with recent research into group-based web contribution and knowledge sharing (Bagozzi & Dholakia, 2006a; Baytiyeh & Pfaffman, 2010; Fang & Chiu, 2010; M. Hsu, Ju, Yen, & Chang, 2007; Kang et al., 2007; C. C. Wang & Cheng, 2006) and by drawing from the empirical findings of Nielsen (2006), we investigated the effects of additional variables like anonymity (Christopherson, 2007) and greed (Markòczy, 2007)that might inhibit contribution behavior.

3.2 The hypothesized model

In Figure 6 we present our hypothesized model. Following the classic MGB framework (Perugini & Bagozzi, 2001) we assumed that the contribution behavior was directly mediated by the we-intentions to act. We hypothesized the target behavior to be directly influenced by the effects of past behavior and perceived behavioral control. Again, as postulated by the MGB (Perugini & Bagozzi, 2004), the desire to contribute, was expected to be another proximal determinant of we-intentions. Additionally, we expected attitudes toward community contributions to significantly influence desire. In line with previous research, we can divide the remaining hypotheses in two main categories: social influences and emotional influences. We predicted that subjective norms,

group norms, social identity (social influences) and anticipated positive and negative emotions (emotional influences) would affect desire. As suggested by Dholakia and Bagozzi (Bagozzi, 2011; Bagozzi & Dholakia, 2006a, 2006b), social identity and group norms affect not only the desire to act, but also the we-intentions to contribute. For this reason we hypothesized that social identity and group norms would influence both desire and we-intentions to act. In our model we also considered the effects of additional variables that will be fully described in the next paragraph.

3.3 Additional predictors: holding back online contribution

In this study our focus was to investigate the contribution behavior through a model of behavioral prediction. However, Nielsen (2006) showed that only 1% of the users of a web community actually perform this behavior. What are the processes that inhibit contribution behavior and stop this process in a web community? Several explanations have been put forward for why some individuals choose to cooperate in social dilemma situations (Markòczy, 2007; Messick & Brewer, 1983) suggesting that some individuals are generally motivated to be more cooperative than others (Kuhlman, Camac, & Cunha, 1986; Markòczy, 2007; Messick & Brewer, 1983). Most empirical and theoretical works suggested that cooperativeness might be inhibit by *greed*, which is a preference to maximize the outcome for the self (Markòczy, 2007). The research has consistently found that people driven by greed are less likely to cooperate across a wide variety of situations in comparison to those who are driven by the preference to maximize the outcome for the group (Kuhlman, Brown, & Teta, 1992; Kuhlman et al., 1986; Markòczy, 2007; Messick & Brewer, 1983)

To our knowledge, in literature there are no studies that try to explain what inhibits users' contribution behavior. Greed may explain why lots of community members play the role of free-riders and choose to get knowledge from the virtual community and to not contribute in. The need to satisfy personal needs, such as finding information or files, could lead to the lack of interest in the community and therefore not to participate in the process of contribution and knowledge sharing turn (Wang & Noe, 2010).

The word “greed” is defined in the dictionary as an “intense and selfish desire for something, especially wealth, power, or food” (OED, 2011). Given the meaning of the word "greed", that intrinsically describes a desire but also something that has some possible behavioral outcomes, we hypothesized that greed might affect the desire to contribute, and it also might have a direct effect on behavior because greed is something that is translated into a behavior by its nature.

Another variable that will be considered in this study is anonymity. In fact, most commentary on the Internet is essentially done anonymously by using unidentifiable pseudonyms, creating more freedom of expression, and less accountability (Palme & Berglund, 2002). In many online environments other people cannot see other members. Social anonymity, especially on the Internet, refers to the perception of others and oneself of being untraceable. In other words, it can happen that an individual is not really anonymous in a social context because of technical issues (for example because of the traceability of the IP address), but he perceives himself to be invisible to others (Christopherson, 2007). Virtual invisibility gives people the courage to do things that they otherwise would not (Suler, 2004)

Several lines of research have shown that anonymity (in the sense of not being identifiable) often promotes anti-normative and anti-social behavior (Piazza & Bering, 2008). Bagozzi and Dholakia (2006) suggested that usually participation in virtual communities is anonymous, and members can leave the community without much effort. For this reasons we thought that anonymity in a virtual community of practice would negatively have influenced the contribution behavior. Accordingly to these suggestions, the perception of anonymity online could be something that precedes the behavioral goal to contribute. One can perceive anonymity only because he or she is connected to the Internet, regardless of whether he is active in a community. When people have the opportunity to separate their actions from their identity, they feel less vulnerable about opening up. Whatever they say or do cannot be directly linked to the rest of their lives. They do not have to own their behavior by acknowledging it (Suler, 2004). We also predicted that anonymity would affect only desire but not the actual behavior. The fact that an individual cannot be denoted as a single

member of the community, could lead to the exploitation of community resources, without in turn feeling the desire to contribute. As shown in figure 6, for these theoretical reasons we added these variables into the basic MGB;

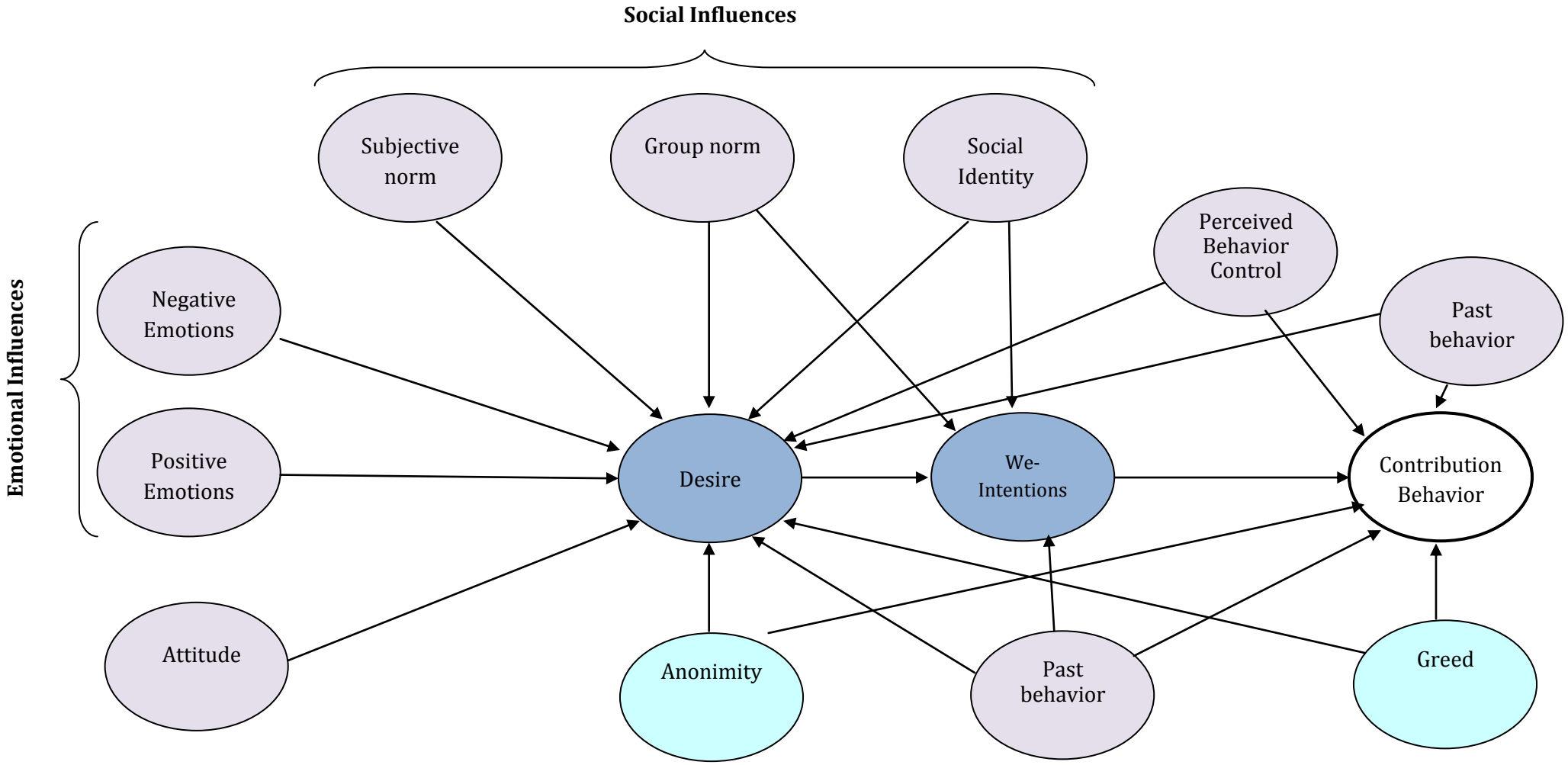

Figure 6. Hypothized augmented MGB model

3.4 Method

3.4.1 Procedure

Data collection was performed on a single online community, named HTCBLOG (http://www.htcblog.com), aimed at solving technical issues related to a specific smart-phone brand. During the period of data collection (February 2010 - April 2010), HTCBLOG was composed approximately of 30.000 registered members. Although this web community has been active since early 2007, it is only in the last two years that the number of subscribers has grown. Nowadays, htcblog.com is a reference community in Italy, reaching more and more subscribers.

To access the community and become a member, a user must register by choosing his/her own nickname. Community members share information on experiences in using their mobile device through comments to news articles posted by the community administrators or through discussions in the forum with other members. As they do in any other voluntary community of practice, the virtual members vary in both their level of contribution and their participation experience. All the messages are visible to every other member and remain accessible through an archive.

We chose a longitudinal design for this study. In the first wave (T1), data collection was realized through an ad-hoc web-survey (Gabbiadini, Mari, & Volpato, 2011). Such a survey was programmed with PHP language and used the support of a MySQL database. The survey was hosted on the web-community's server. Before beginning, we obtained permission from the community service provider. The community webmaster granted the privacy of personal data treatment.

To recruits participants, who took part at the survey voluntarily, we used different ways. First of all the community administrators forwarded our e-mail presentation to htcblog.com members in order to explain the purpose of the survey and encourage their participation, as well as to guarantee the confidentiality of all the responses. We also inserted a banner (with a hyperlink to our Web survey) in the home page and a pop-up message appeared every time a user logged into the

community. To encourage community members to complete the questionnaires, we additionally launched a competition with three prizes for a total value of 50 €.

Participants logged into the survey by the same nickname they used for the community. To ensure that each member did not complete the questionnaire twice and to avoid double entries in the database, we recorded each respondent's nickname, date, and time of survey completion. No other personal information were requested or registered in order to guarantee the participants' privacy. A message related to the processing of personal data and privacy protection was presented in the first page of the survey.

In the first part of the questionnaire (T1) we used items to measure desire and its antecedents and in the second part we assessed both we-intentions and perceived behavioral control.

In the follow-up phase (T2) about one months later the administration of the questionnaire, the community webmaster gave us access to the website database that hosts htcblog.com. We then analyzed the actual contribution of every single user. For every respondent, we counted his/her posts and interventions on the forum recorded in the database. To do this, we double-crossed the date in which every user completed the questionnaire and his/her nickname. In this way it was possible to encode the actual behavior of every respondent for the month after he/she complete the questionnaire.

3.4.2 Sample characteristics

A total of 263 participants completed the survey (T1). 219 of the community members were male (84.9%) and 44 were female (15.1%). Their mean age was 33.26 years (M = 33.26, SD = 14.34). In terms of membership duration, 22.5% had joined htcblog.com less than three months before, 15.0% had joined the community between three and six months before, 32.8% had been a member for over six months and less than one year, 25.3% more than one year but less than two years and 4.3% had been registered for over two years (M = 2.74, SD = 1.19).

The average access to the community, measured on a categorical scale with four intervals, shows that 17.8% of total users accessed the community once a day, 27.9% more than once a day but less than five times a week, 24.8% more than five times a week but less than 15 times per month and 29.5% accessed the community more than 15 times a month (M = 2.66, SD = 1.084).

3.4.3 Measures

Attitudes

Attitudes were assessed using 7-point semantic differential items with four adjectives: *Foolish – Wise, Pleasant – Unpleasant, Bad – Good, Depressing – Funny*. Scales were anchored by 1 assigned to the negative pole and 7 to the positive one, with 4 indicating *neither / nor.* The items were introduced by the sentence *"*Accessing htcblog.com for contributing to the contents of the community and add comments to the discussions of the community, in the next month, would be…"

Emotional influences: Anticipated positive and negative emotions

Anticipated emotions were measured with a 7-point scale (Perugini & Bagozzi, 2001) ranging from (1) *not at all* to (7) *very strongly*. Emotions were introduced with the following statement: "If I could contribute by entering one or more comments on htcblog.com, during the next month, I would feel…" and then we presented a list of five positive emotions (*happy, satisfied, proud, self-assured, relieved*). A list of the five negative emotions was introduced by a similar sentence "If I could not contribute by entering one or more comments on htcblog.com, during the next month, I would feel…"; the five negative emotions were expressed by the degree in which the respondent would feel *worried, depressed, sad, angry or frustrated*.

Subjective and group norms

Group norms were measured on a 7-point scale (Bagozzi & Dholakia, 2006a, 2006b) anchored by *not at all* (1), *very strongly* (7) and (4) labeled *quite enough.* Items were introduced by the following sentence:" Using htcblog.com to contribute by entering comments about HTC smartphones and problems with phones based on Android and Windows Mobile with other people

with similar interests can be considered a goal. For the listed community members, please estimate the strength with which everyone pursues this goal". We then measure group norms on four different levels, which represent the different roles that one member can have in the community asking (a) the strength of one self's goal, (b) the strength of an active member's goal, (c) the strength of the readers member's goal and (d) the strength of the moderators of the community's goal.

To measure subjective norms, the following 7-point items (Bagozzi & Dholakia, 2006a, 2006b; Perugini & Bagozzi, 2001) were employed: "Most people who are important in my life think that I *should* (7) / *should not* (1) contribute to this community by entering one or more comments during the next months." And the second item "Most people who are important to me would *approve* (1) / *disapprove* (7) of me contributing to this community by entering one or more comments during the next months".

Perceived behavioral control

Two items were employed (Perugini & Bagozzi, 2001) for measuring PBC. The first one was "How much control do you think you have over contributing to this community by entering one or more comments in htcblog.com during the next months?". A 7-point scale ranging from (1) *no control*, to (7) *total control*, and the midpoint (4) *a moderate control*, followed. The second item was expressed in the form "How much easy or difficult do you think it is for you, to contribute with one or more comments in htcblog.com during the next month?" and was measured with a 7 points scale ranging from (1) *very difficult* to (7) *very easy.*

Past behavior

To access the frequency of past behavior, the following item was used "How often in the past did you contribute with comments or suggestions into discussions on htcblog.com?", measured on a 5-point scale : (5) *Daily*, (4) *A few times a week*, (3) *A few times a month*, (2) *About once a month*; (1) *Less than once a month*. Recency of past behavior was measured with the item "How

often during the last month, did you contribute with comments or suggestions into discussions on htcblog.com?", followed by the same 5-point scale.

Identification process

In order to measure identification with the community group, we used a shortened adapted version of the scale proposed by Capozza, Brown, Aharpour and Falvo (2006): We used eight items, followed by a 7-point scale, anchored by (1) *strongly disagree*, (7) *strongly agree*, and (4) that means *neither agree / nor disagree*. The items were: "I evaluate positively being a member of htcblog.com"; "Being a member of htcblog.com provides me with prestige"; "I feel tied to the other members of htcblog.com"; "I feel attached to the other members of htcblog.com"; "Being one of hctblog.com members is something I often think about"; "I often think about being a member of htcblog.com during the day"; "I do not usually behave as a typical member of htcblog.com"(reversed score); "I would feel uncomfortable if the media (TV, newspapers, other web-communities) criticized the members of htcblog.com".

Desire

Three 7-point items were used to measure the construct of desire (see e.g. Bagozzi & Perugini, 2001). The first item was expressed with the sentence "I desire to contribute to the contents of the community and add comments to the discussions of the community, during the next month", where 1 indicates *strongly disagree*, 7 *strongly agree* and 4 indicates *neither agree / nor disagree*. The second item was "My desire to contribute to the contents of the community and add comments to the discussions of the community during the next month can be described as…." for which participants selected one of 7 different options: (1) *no desire*; (2) *very weak desire*; (3) *moderate desire*; (4) *quite strong desire*; (6) *strong desire*; (7) *very strong desire*. The third item was the following statement: "I would like to cooperate with others by entering one or more comments in htcblog.com, during the next month. This assertion: *does not describe me at all* (1) – *describe me completely* (7). The midpoint (4) indicated "*It describes me somewhat*".

We-intentions

Two items of agreement, adapted from Bagozzi and Lee (2002), were used to measure we-intentions: "I intend that our group, the other members of htcblog.com and I, contribute to the contents of the community by adding comments or suggestions to the discussions of the community, during the next month." and "We - the other members of htcblog.com and I - intend to contribute to the contents of the community by adding comments or suggestions to the discussions of the community, during the next month". Both items were followed by a 7-point scale in which 1 indicated *strongly disagree* and 7 indicated *strongly agree* (4=*neither agree / nor disagree*).

Greed

In order to measure the construct of greed we used a reduced version of the scale proposed by Markòczy (2007), composed of five items, measured on a 7-point scale ranging from (1) *strongly disagree*, to (7) *strongly agree*, and the midpoint (4) *neither agree / nor disagree*. The five items were:

(1) By not contributing with comments on htcblog.com, I won't end up worse off than anyone else. (2) If everyone else contributes a lot with comments on htcblog.com, then I get the best of both situations if I do not. (3) If others put a large amount of effort into contribution on htcblog.com and I do not, that is my gain and their loss. (4) Let the *suckers* put a lot of effort into contributing on htcblog.com. (5) By not contributing with comments on htcblog.com, I'll come out better off than those who contribute a lot.

Anonymity

To measure anonymity we created an ad hoc four-item scale. The first item was "I prefer to use a nickname instead of my real name or its diminutives, accessing the web community"; the second item was expressed in the form of "Since I cannot be tracked in real life using my nickname, I feel more free to not contribute on-line"; the third item was "If I had to use my real name, I wouldnot contribute to the community" and finally, the fourth item was "I do not think it is correct

to be traced within htcblog.com". All the items were measured on a 7-point scale ranging from (1) *strongly disagree*, to (7) *strongly agree*, and the midpoint (4) *neither agree / nor disagree.*

Contribution Behavior

The dependent variable in this study was *contribution behavior* that represented the way members share their knowledge with the other members of the community. To measure the behavior we considered the number of messages posted in the forum and the number of comments posted by members in the internal pages of htcblog.com. For every participant we considered his/her contribution in the month following the date in which he/she completed the questionnaire.

3.5 Data analyses

Confirmatory Factor Analysis (CFA) was used to test the adequacy of the measurement model. Structural Equation Modeling (SEM) was used to test the proposed theoretical framework. In both cases (CFA and SEM) the LISREL 8.54 software was employed (Jöreskog & Sörbom, 2006). The goodness-of-fit of the estimated models was assessed with χ^2 test in which satisfactory fits are obtained when the test is non-significant. However the χ^2 test is particularly sensitive to the sample size. For such a reason, other indexes independent of the sample size were examined as well: the root mean square error of approximation (RMSEA), standardized root mean square (SRMR), and the comparative fit index (CFI). Satisfactory model fits are indicated by RMSEA and SRMR values less than or equal to 0.08, CFI values greater than or equal to 0.95 (Bagozzi & Yi, 1988; Bearden, Sharma, & Teel, 1982; Hu & Bentler, 1999). Discussions of these indices may be found in Bentler and Bonett (Bentler, 1990; Bentler & Bonett, 1980), Browne and Cudeck (1993), and Marsh, Balla, and Hau (1996).

All analyses were performed on covariance matrices. In order to yield models with less parameters to estimate, for latent variables with more than two items the parameters were combined to produce two indicators, using a partial disaggregation model (Bagozzi & Heatherton, 1994). Item parcels were created by averaging multiple measures, reducing the number of parameters that must

be estimated in the SEM model; this procedure is particularly useful with a smaller sample size to diminish the likelihood of computational problems (see Bagozzi & Edwards, 1998).

Models were also compared for their predictive power by inspecting the R^2 within each model. In contrast, the chi square test difference was applied for nested models.

3.6 Results

3.6.1 Descriptive statistics

We verified that the data collected for each variable were normally distributed. All variables were normally distributed, except for negative anticipated emotions. The plot in Figure 7 shows that subjects responded mainly by choosing the value 1 on the 7-point scale. For this reason, we decided not to consider the construct of negative emotions and to use only the anticipated positive emotions construct.

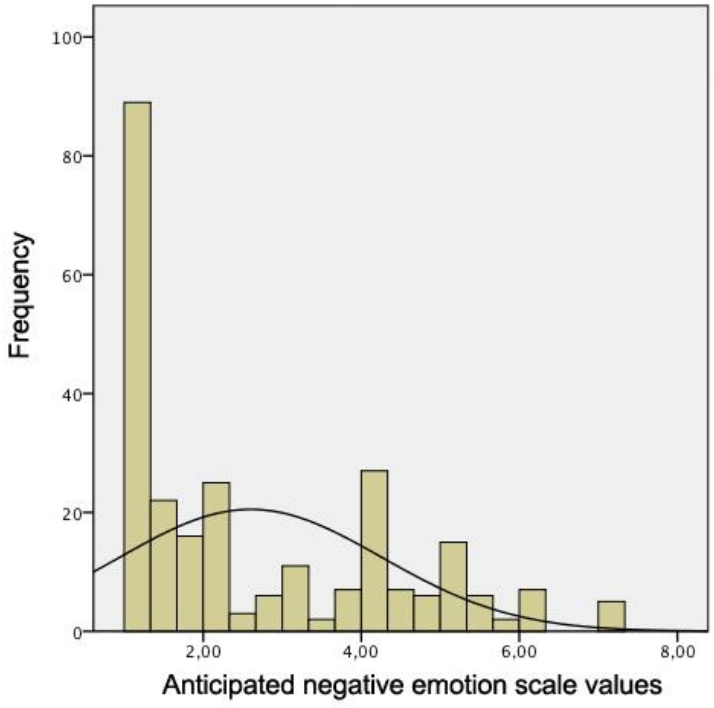

Figure 7 – Frequency distribution for negative anticipated emotions answers

The reliability coefficients were greater then .65 for all the scales (see Table 1) except for the measure of attitude. In this latter the elimination of the item 2 (reversed item) improved the

alpha from .70 to .81. Given the adequate internal consistency for each measure, we calculated composite scores for each scale. Thus, t-test was used to verify whether the mean scores were significantly different from the midpoint of the respective scale. Results indicate that all scores resulted different, except for the measure of perceived behavioral control, whose mean was not different from the central point of the scale (Table 1).

Table 1 - Reliabilities, means and standard deviations for each construct

	α	**N**	***M***	***SD***	**t**	**p**
Attitudes	.815*	258	5.55	1.10746	22.140	.000
Positive anticipated emotions	.940	256	4.54	1.33804	6.467	.000
Subjective norms	.689	258	4.90	.90848	15.674	.000
Perceived behavioral control	.657	256	4.14	1.34915	1.833	.068
Past behavior	.887	251	1.76**	1.07263	-18.242	.000
Group norms	.782	258	4.46	1.16438	6.404	.000
Social identity	.775	258	4.14	.93905	2.452	.015
Desire	.849	259	4.19	1.18056	3.142	.002
We intentions	.926	251	4.78	1.24731	9.918	.000
Anonimity	.867	256	4.33	1.38028	-10.290	.000
Greed	.908	258	3.10	1.36470	3.852	.000

Note: N varies because of missing values.
(*) Alpha calculated on three items
(**) mid-point = 3. For all others measures, mid-point=4.

As we can see from the means, respondents declared to consider contributing to htcblog.com, as advantageous and good, showing a positive attitude toward contribution. The perceived social pressure is mildly considerable: referents are expected to approve this behavior. Social identity mean is significantly higher than the midpoint of the scale, showing that respondents feel a moderate but positive identification with the other members of the community. According to

the emotions, the anticipation of success while posting online produces emotions of joy, pride and satisfaction. People who completed the survey, declared to feel a desire of contributing in the following month; they also declared their we-intentions to post and contribute to the community contents. An additional *t*-test ($t(250) = -7.34$, $p < .001$) showed that there was a significant statistical difference, between desire and we-intentions. Respondents showed more collective intention to act but less desire to do it.

Regarding the two variables that are supposed to inhibit the contribution, the respondents show a moderate perception of anonymity within the community, and a slight motivation dictated by greed.

Finally, the analysis of comments posting frequency on the forum and on the internal pages of the community website indicated that 83% of the respondents never posted messages or comments during the considered period of data collection; 14% posted fewer than 10 times, 1.6% contributed more than 10 times but less than fifty times, and only 1.4% contributed more than fifty messages or comments ($M = 7.689$, $SD = 77.83$). It should be noted that the percentage distribution is consistent with Nielsen's empirical observations.

3.6.2 Confirmatory factor analysis

The distinction between the constructs of desire and we-intentions was crucial for our research. For this reason we decided to conduct a deeper analysis of the discrimination for the two latent constructs.

We run a two factors CFA, which obtained a satisfactory fit: χ^2 (1) = 0.0053, p ≈ 0.94; RMSEA = 0.0; SRMR =0.00033; CFI =1.00; Factor loadings were all high and consistent (see Figure 8). Convergent validity for desire and we-intentions was achieved because the measures loaded only on the respective factor. Discriminant validity, instead, emerged from the fact that latent variables showed correlations lower than 1.0 ($\phi = .58$ $p < .001$, $SE = .05$); the confidence interval, obtained by considering two standard errors above and two standard errors below the

estimate correlation, did not include the perfect correlation. The correlation between the two latent constructs was moderately large. Similar results were also reported in a number of previous studies (see Bagozzi & Dholakia, 2002, 2006a; Dholakia et al., 2004). However, distinction between intentions and desire was decisive for our models, thus we used a more restrictive criterion for the distinction between constructs, testing the significance of the χ^2 indexes difference between the models (Bollen, 1989; Kline, 1998).. In one general model (baseline) we freely estimated the correlations for we-intentions and desire constructs; in a second model the correlation was constrained to be equal to 1. The two models were then compared. The significance of the difference in the values of chi-square was then checked: if the latter would be significant, the two models differ from each other. Consequently the constructs under analysis were to be considered as distinct.

The model with the correlation forced equal to 1 showed a χ^2 value of 143.48, df = 2, $p \approx 0.94$. The difference with the baseline model ($\Delta\chi^2$) was 143.47, df = 1, that corresponds to a p-value of 0.0044. Thus, we could claim that desire and we-intentions were different constructs (Figure 8).

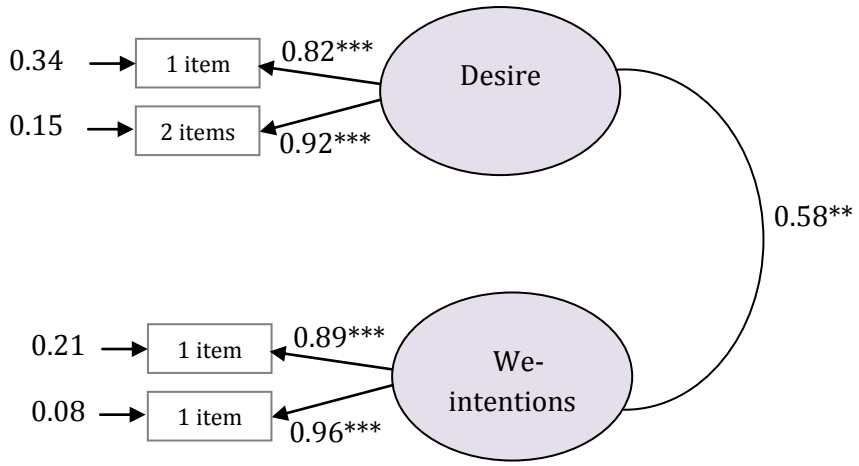

Figure 8 - Discriminant analysis for desire and we-intentions.
Note: N=250 ; *p < .05;**p < .01;***p < .001

Confirmatory factor analysis was also used to investigate convergent and discriminant validity of all the variables included in the hypothesized model. We considered thirteen latent variables. Two indicators were used to operationalize each latent construct, except for the

contribution behavior that had only one observed variable (see Table 2). Similar to the methodology used by other authors (see Bagozzi, 2011), we recoded the number of posted messages into five categories, representing individual contribution: never (0), from one to ten messages (1), ten to fifty (2), and more than fifty comments or messages on the forum (3).

The model fit the data well: χ^2 (165) = 279.04, $p \approx .00$; Even if the χ^2 test was significant, all the other goodness of fit indexes were satisfactory: RMSEA = .055; SRMR = .044; CFI = .98; factor loadings were all high and consistent. Convergent validity was achieved because measures load only on the respective factor. Table 2 reports factor loadings of each latent construct and Table 3 reports the correlation matrix of parceled items used for the structural models. Table 4 shows the correlation matrix of latent variables.

Table 2 - Completely standardized solution: Factor loadings for confirmatory factor analysis

Factor	**Measures for aggregate**	**Loading**
Attitudes	1 item	.93
	2 items	.69
Positive anticipated emotions	2 items	.98
	3 items	.92
Subjective norms	1 item	.69
	1 item	.77
Perceived behavioral control	1 item	.66
	1 item	.81
Past behavior	1 item	.75
	1 item	.95
Group norms	2 items	.65
	2 items	.84
Social identity	4 items	.92
	4 items	.98
Desire	2 items	.87
	1 item	.86
We intentions	1 item	.89
	1 item	.96
Contribution behavior *	1 item	1.00
Anonimity	2 items	.82
	3 items	.93
Greed	2 items	.85
	3 items	.93

Note: Significance for all factor loading was p<.001.
*observed variable

Table 3 - Correlation matrix of parceled items

Attitude1	1.000																						
Attitude2	.638**	1.000																					
Positive emo1	.230**	.314**	1.000																				
Positive emo2	.272**	.332**	.901**	1.000																			
Subjective norm1	.048	-.024	.112	.069	1.000																		
Subjective norm2	.055	.094	.166**	.127*	.530**	1.000																	
Group norm1	.271**	.253**	.273**	.347**	.215**	.206**	1.000																
Group norm2	.165**	.281**	.480**	.461**	.241**	.271**	.540**	1.000															
PBC1	-.062	.115	.328**	.301**	.091	.096	.067	.306**	1.000														
PBC2	-.019	.125*	.349**	.363**	.121	.143*	.214**	.402**	.531**	1.000													
Past behavior1	.038	.066	.190**	.203**	.065	.056	.119	.276**	.292**	.314**	1.000												
Past behavior2	-.077	-.011	.192**	.167**	.102	.043	-.016	.238**	.333**	.355**	.740**	1.000											
Desire1	.105	.296**	.490**	.486**	.169**	.201**	.352**	.516**	.426**	.519**	.297**	.338**	1.000										
Desire2	.255**	.449**	.459**	.477**	.136*	.195**	.349**	.492**	.314**	.416**	.234**	.245**	.750**	1.000									
We intentions1	.289**	.342**	.430**	.490**	.071	.110	.458**	.427**	.163**	.414**	.208**	.125*	.417**	.469**	1.000								
We intentions2	.225**	.314**	.444**	.509**	.071	.160*	.413**	.495**	.241**	.468**	.261**	.213**	.449**	.507**	.850**	1.000							
Social identity1	.135*	.295**	.554**	.533**	.065	.186**	.378**	.552**	.299**	.461**	.292**	.265**	.573**	.573**	.461**	.508**	1.000						
Social identity2	.241**	.341**	.544**	.562**	.131*	.257**	.443**	.528**	.253**	.432**	.168**	.165**	.527**	.537**	.468**	.518**	.755**	1.000					
Anonymity1	.089	.066	.143*	.146*	.065	-.005	.066	.155*	.190**	.113	-.006	.011	.075	.058	.104	.045	.145*	.240**	1.000				
Anonymity2	.042	-.020	.106	.142*	.025	-.072	.043	.088	.134*	.099	.008	.010	-.037	-.047	.048	.021	.119	.176**	.760**	1.000			
Greed1	-.137*	-.003	.136*	.058	.070	-.007	-.027	.187**	.320**	.249**	.037	.137*	.135*	.052	.046	.067	.256**	.186**	.282**	.271**	1.000		
Greed2	-.121	-.040	.062	.010	.097	.012	-.069	.142*	.265**	.225**	.140*	.184**	.129*	.044	.055	.050	.249**	.154*	.218**	.210**	.784**	1.000	
Contribution	,064	,047	,056	,110	,000	,033	,059	,052	,043	,178**	,113	,061	,236**	,138*	,165**	,165**	,119	,132*	-,017	-,017	-,097	-,076	1.000

Note. N=250 listwise exlusion. *$p < .05$; **$p < .01$; ***$p < .001$

Table 4 - Correlation matrix of latent variables

	Desire	**We-int**	**Behavior**	**Attitude**	**Pos-emo**	**S-norm**	**PBC**	**Past**	**G-norm**	**Social-id**	**Greed**	**Anonym**
Desire	1.00											
We-intentions	0.58***	1.00										
Behavior	0.21**	0.18**	1.00									
Attitude	0.44***	0.38***	0.06	1.00								
Positive emotions	0.58***	0.54***	0.10	0.38***	1.00							
Subjective norms	0.28***	0.16*	0.02	0.07	0.16*	1.00						
PBC	0.67***	0.52***	0.17*	0.13	0.48	0.22*	1.00					
Past behavior	0.36***	0.23***	0.11	-0.01	0.20***	0.10	0.50***	1.00				
Group norms	0.68***	0.62***	0.07	0.38***	0.57***	0.42***	0.53***	0.25***	1.00			
Social identity	0.74***	0.61***	0.14*	0.38***	0.66***	0.26***	0.59***	0.28***	0.73***	1.00		
Greed	0.12	0.07	-0.10	-0.06	0.06	0.06	0.39***	0.18**	0.15*	0.28***	1.00	
Anonimity	0.00	0.05	-0.02	0.03	0.16*	-0.01	0.19*	0.01	0.14	0.21**	0.31***	1.00

Note: N=250 ; *$p < .05$;**$p < .01$;***$p < .001$

3.7 Structural Models

We first tested the classic MGB model considering the contribution behavior in a virtual community as the goal behavior. In a second stage, greed and anonymity were included in the model, testing an augmented version of the MGB. Both models (basic and augmented) are expressed also through a theoretical diagram using the structural equation models notation (see Figure 9 and 10 for the basic model and Figure 12 and 13 for the augmented model).

3.7.1 Testing the basic MGB

In this section the structural model findings for the basic model of goal directed behavior are presented (see Figure 9 and 10); the fit statistics were satisfactory: $\chi^2[119] = 225.08$, $p \approx .00$, RMSEA = .062, SRMR = .046, and CFI = .98.

We found a positive and significant effect of attitudes on desire ($\gamma = .20$, $p < .01$). PBC positively influenced the desire to contribute ($\gamma = .34$, $p < .001$). In this model, social identity emerge as significant predictor of desires ($\gamma = .29$, $p < .01$) and intentions ($\gamma = .27$, $p < .01$). Group norms predicted only we-intentions to act ($\gamma = .30$, $p < .01$) but not desire.

The effects of subjective norms on desire were not significant. The path from anticipated positive emotions to desires and the effects of past behavior were not significant;

Desire predicted we-intentions ($\beta = .21$, $p < .05$) but intentions did not predict behavior.

Attitudes, social identity and perceived behavioral control, accounted for the 68% of variance in desires. In the basic model, we-intentions did not mediate the effects of the considered variables on behavior, accounting only for the 4% of variance in contribution behavior.

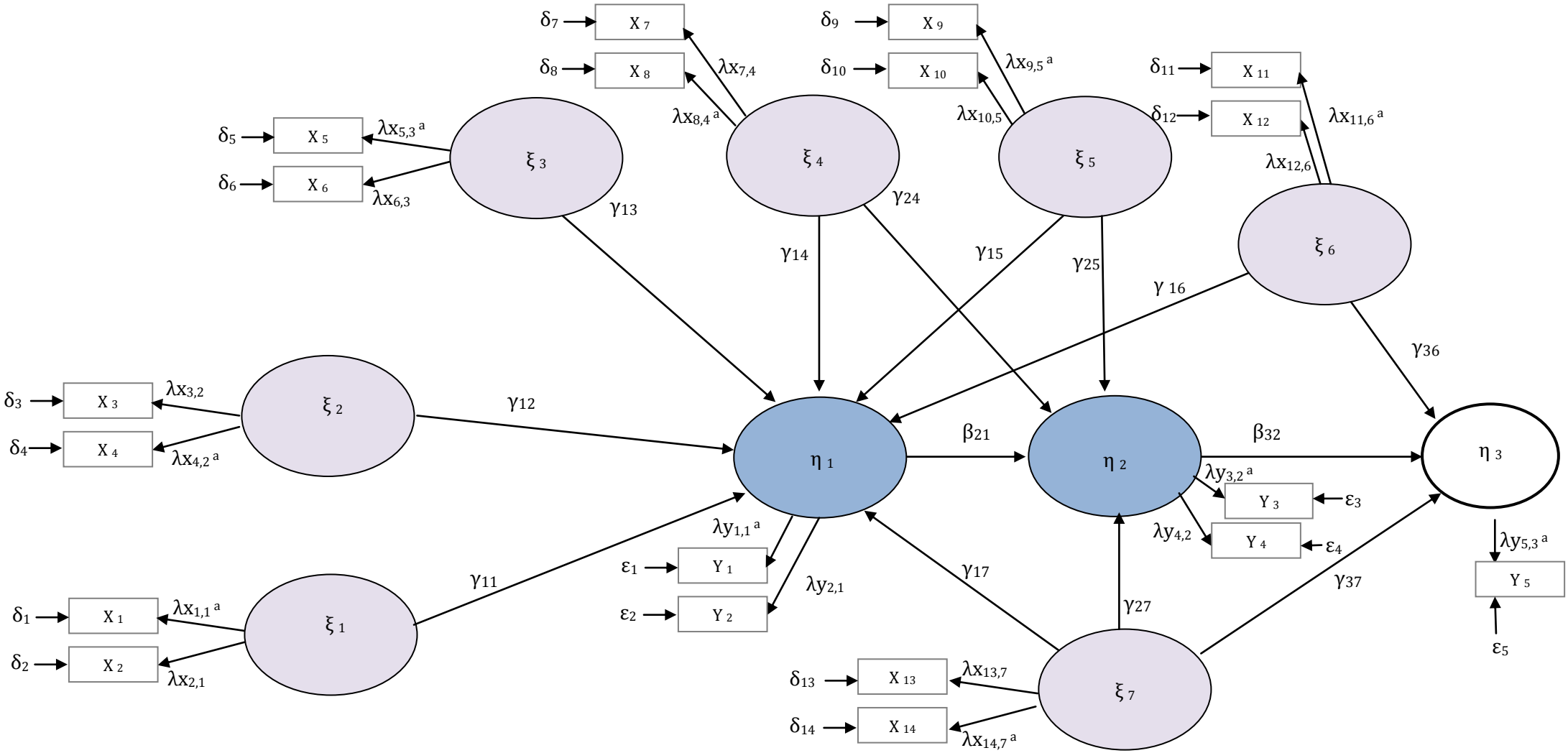

Figure 9. MGB theoretical mode. Note. a = fixed parameter.

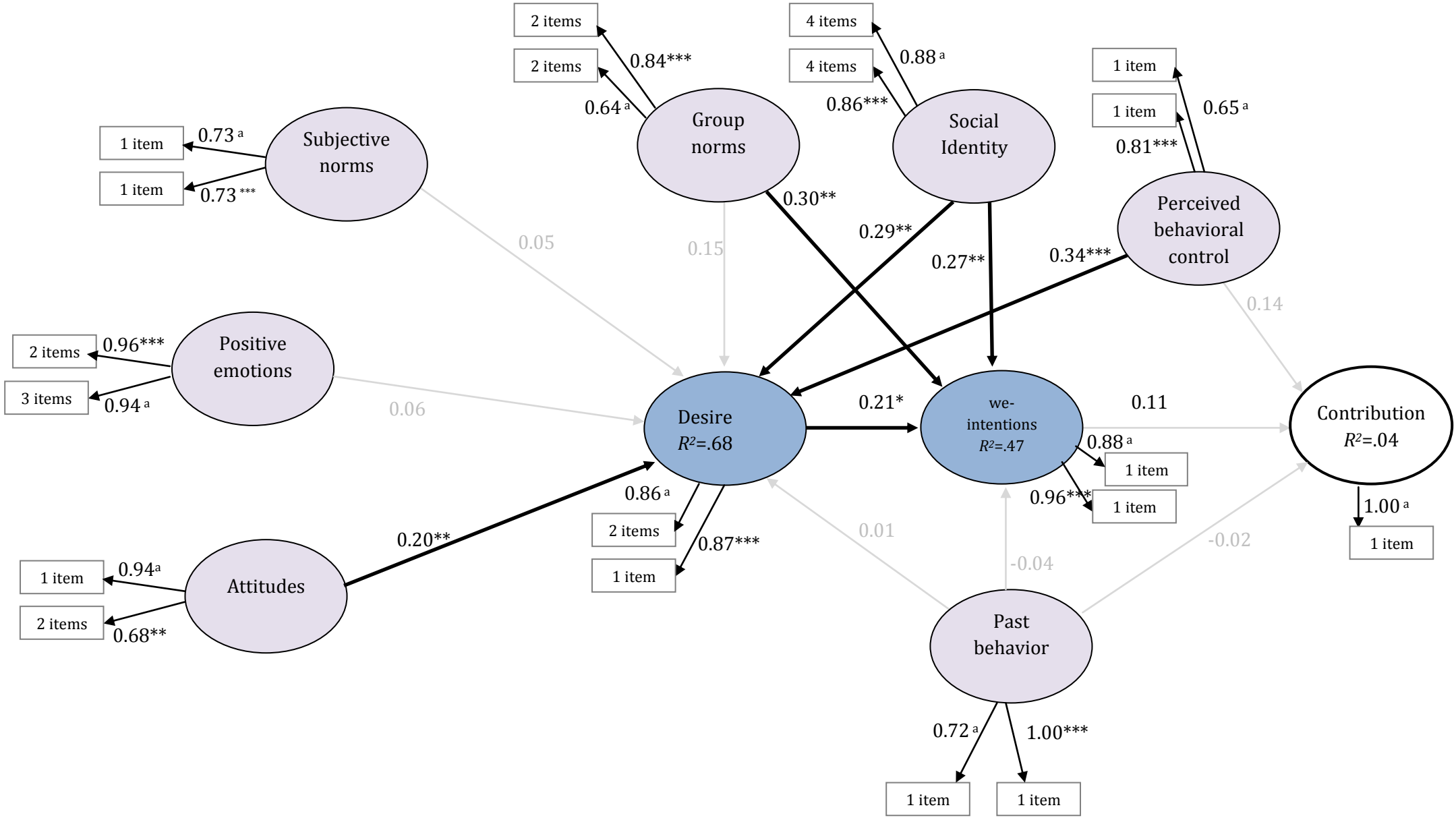

Figure 10. Findings for basic MGB model, completely standardized parameter (N = 250). Errors and correlations are omitted for the sake of simplicity.
Note. *$p < .05$; **$p < .01$; ***$p < .001$; a = fixed parameter.

3.7.2 Tests of mediation and rival hypotheses for the basic model

We performed formal tests of mediation for all possible direct paths not specified in the hypothesized model (see Bagozzi & Dholakia, 2002, 2006a; Dholakia et al., 2004). A difference in the chi-square values of the two models, with one degree of freedom, indicates the significance of the added path. If the difference is not significant, we may conclude that this direct path is not significant.

We list in Table 5, the eleven tests of rival hypotheses for the direct effects. We found a significant path from positive anticipated emotions to we-intentions ($\gamma = .16$, $p < .01$) and from PBC to we-intentions ($\gamma = -.19$, $p < .01$). Although, we did not assist to a relevant increase in the explained variance for, we-intentions (2%) with the introduction of these paths in the model (Figure 11).

Table 5 – MGB mediation tests

	Model	**Goodness-of-Fit**	**Tests of Hypotheses**
M_1	baseline model	$\chi^2[119] = 225.08$, $p \approx .00$, RMSEA = .062, SRMR = .046, and CFI = .98	
M_2	desire → contribution	χ^2 (118) = 223.66, p = 0.0	M_1–M_2: χ^2_d (1) =1.42, p = 0.233
M_3	attitude → we-intentions	χ^2 (118) = 223.34, p = 0.0	M_1–M_3: χ^2_d (1) =1.74, p = 0.187
M_4	**anticipated positive emotions → we-intentions**	**χ^2 (118) =220.57, p = 0.0**	**M_1–M_4: χ^2_d (1) = 4.51, p = 0.03**
M_5	subjective norm → we-intentions	χ^2 (118) =221.75, p = 0.0	M_1–M_5: χ^2_d (1) = 3.33, p = 0.068
M_6	**PBC → we-intentions**	**χ^2 (118)= 220.85, p = 0.0**	**M_1–M_6: χ^2_d (1) =4.23, p = 0.039**
M_7	attitudes → contribution	χ^2 (118)= 225.07 p = 0.0	M_1–M_7: χ^2_d (1) =0.01, p = 0.923
M_8	positive anticipated emotion → contribution	χ^2 (118)= 224.80 p = 0.0	M_1–M_8: χ^2_d (1) =0.28, p = 0.596
M_9	subjective norm → contribution	χ^2 (118) = 224.92 p = 0.0	M_1–M_9: χ^2_d (1) =0.16, p = 0.689
M_{10}	group norm → contribution	χ^2 (118) = 223.97 p = 0.0	M_1–M_{10}: χ^2_d (1) =1.11, p = 0.292
M_{11}	social Identity → contribution	χ^2 (118) = 225.07 p = 0.0	M_1–M_{11}: χ^2_d (1) =0.01, p = 0.923

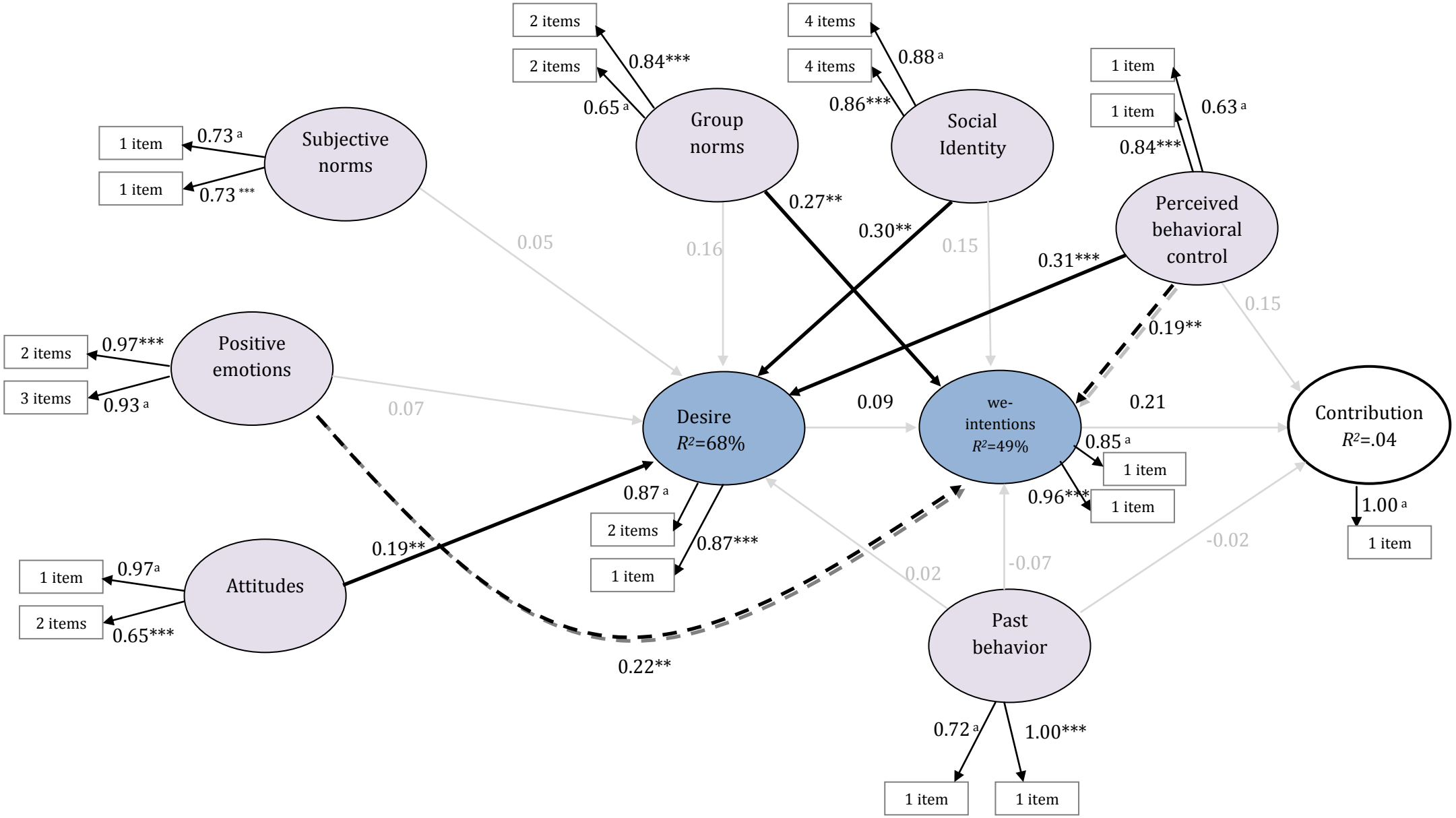

Figure 11 – Findings for MGB plus direct paths, completely standardized parameter (N = 250). Errors and correlations are omitted for the sake of simplicity.
Note: *p < .05; **p < .01; ***p < .001; a = fixed parameter.

3.7.3 Testing the augmented MGB model

We predicted in our hypothesis that greed and anonymity constructs could represent a form of contribution inhibition. Thus, we added them to the basic MGB model as predictors of desire and contribution (Figure 12). The introduction of these two variables confirmed the effects found in the baseline model previously tested while fit indexes between the basic model (Figure 9) and the augmented model (Figure 12) improved significantly. The model fit the data well: $\chi^2(177) = 298.93$, $p \cong .00$, RMSEA = .054; CFI = .98, SRMR = .046.

We found a positive and significant effect of attitudes on desire ($\gamma = .19$, $p < .01$). PBC positively influenced the desire to contribute ($\gamma = .41$, $p < .001$). In the augmented model, social identity emerged as significant predictor of desires ($\gamma = .34$, $p < .01$) and we-intentions ($\gamma = .24$, $p < .01$). Group norms predicted only we-intentions to act ($\gamma = .31$, $p < .01$) but not desire.

In agreement with previous research the effects of subjective norms on desire were not significant. The path from anticipated positive emotions to desires and the effects of past behavior were not significant; Results showed the positive effects of desires on we-intentions ($\beta = .23$, $p < .05$). Attitudes, social identity, perceived behavioral control and past behavior accounted for 73% of the variance in desires and 47% of the variance in we-intentions to contribute (Figure 13).

Theoretically, we assumed that anonymity and greed would negatively affected desire and contribution behavior,. Results showed, as predicted, that the anonymity influenced negatively only the desire to contribute ($\gamma = -.15$, $p < .01$) but not contribution behavior. Greed directly affected negatively both the actual behavior ($\gamma = -.21$, $p < 0.01$) and desire ($\gamma = -.13$, $p < 0.01$). The variance accounted for the observed behavior, considering the effects of these new variables, was equal to 7%.

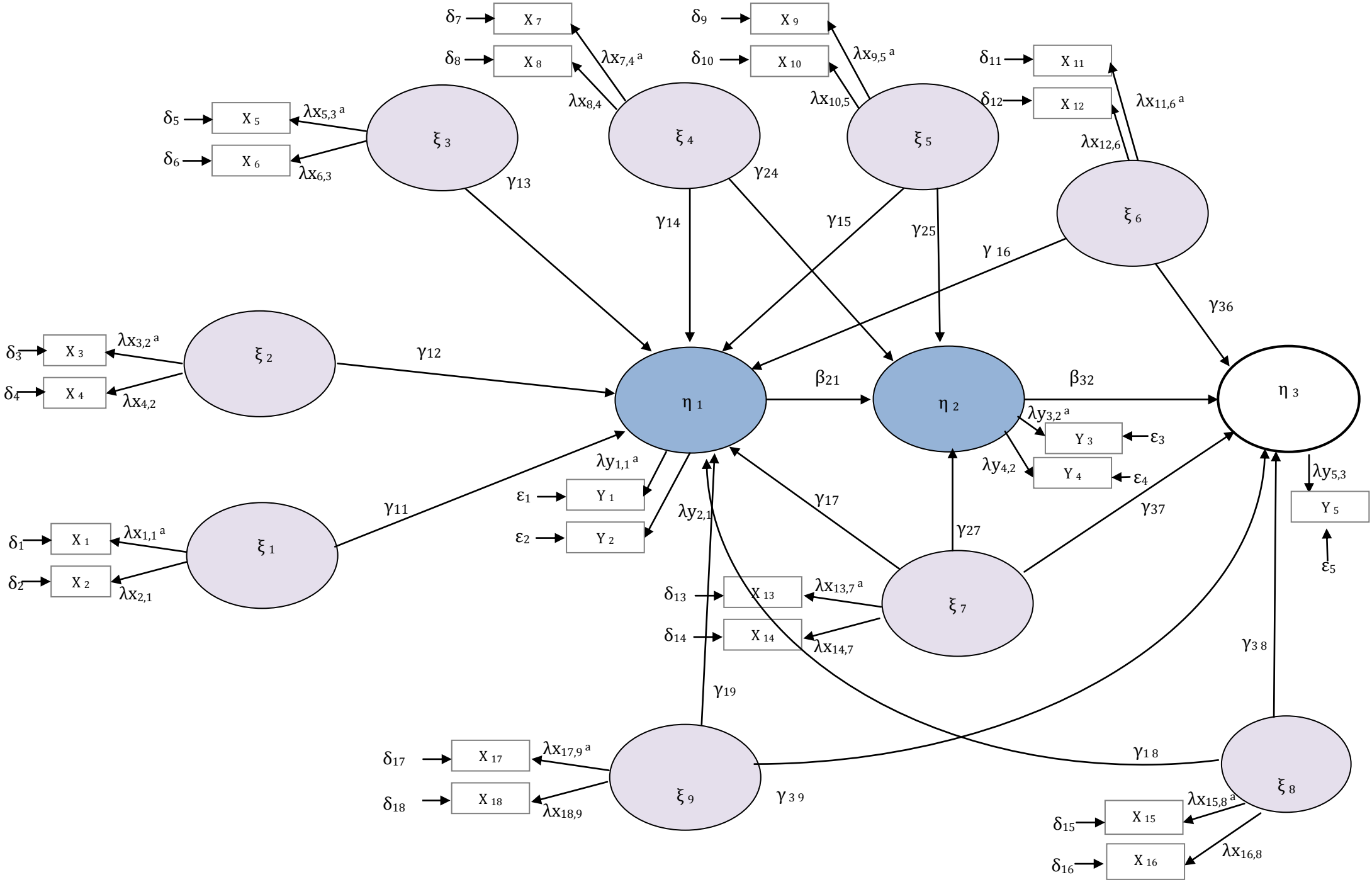

Figure 12 – Theoretical model of augmented MGB. **Note:** a = fixed parameter.

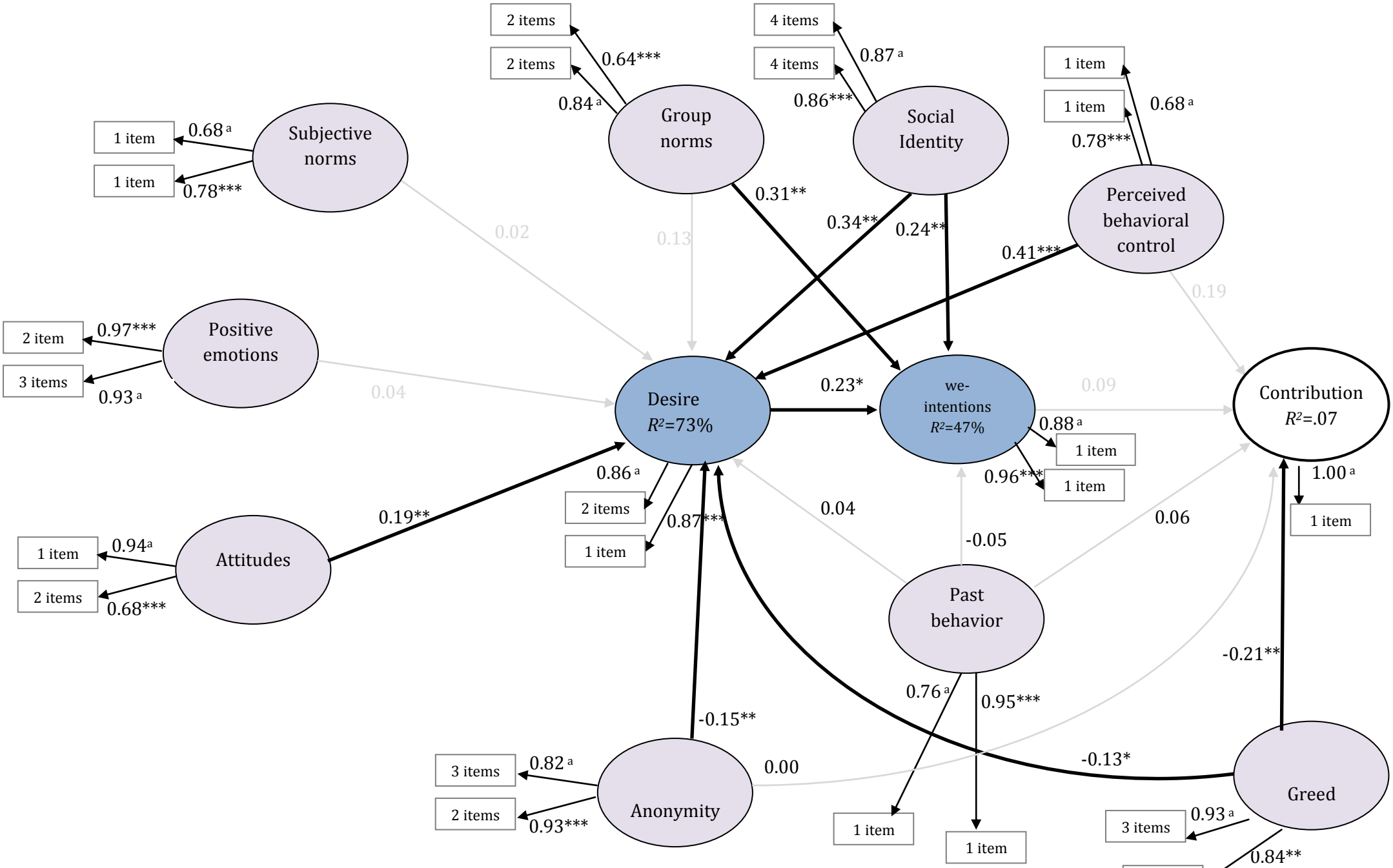

Figure 13 – Findings for MGB augmented model, completely standardized parameter (N = 250). Errors and correlations are omitted for the sake of simplicity. **Note:** *p < .05; **p < .01; ***p < .001; a = fixed parameter

3.7.4 Tests of Mediation and Rival Hypotheses for the augmented model

We performed formal tests of mediation for all possible paths to endorse whether additional direct paths, not specified in the hypothesized model, had significant direct effects (Bagozzi, 2011). As we show in Table 6, of the thirteen tests of rival hypotheses for the direct effects, only one indicates that we cannot reject the rival hypotheses. The goodness-of-fit statistics for a model that includes anticipated positive emotions additional path to we-intentions reach the following values: $\chi^2(176) = 293.53$, $p \approx .00$, RMSEA = .054, SRMR = .046 and CFI = .98. The direct path from positive emotion to intentions (γ_{32} =0.18, p<0.05) contributed only with a small amounts of variance in we-intentions (R^2=.48). This significant effect implies that we-intentions are directly influenced by the positive emotions toward the contribution behavioral goal (see Figure 14).

Table 6 – Augmented MGB mediation tests

	Model	Goodness-of-Fit	Tests of Hypotheses
M_1	baseline model	χ^2 (177) = 298.93, $p \cong .00$, RMSEA = .054 CFI = .98, SRMR = .047	
M_2	desire → contribution	χ^2 (176) = 298.34, p = 0.0	M_1–M_2: χ^2_d (1) =0.59, p = 0.44
M_3	attitude → intentions	χ^2 (176) = 297.17, p = 0.0	M_1–M_3: χ^2_d (1) =1.76 , p = 0.18
M_4	**anticipated positive emotions → intentions**	**χ^2 (176) =293.53, p = 0.0**	**M_1–M_4: χ^2_d (1) = 5.40, p = 0.020**
M_5	subjective norms → intentions	χ^2 (176) =295.52, p = 0.0	M_1–M_5: χ^2_d (1) = 3.41, p = 0.064
M_6	greed → intentions	χ^2 (176) =297.61, p = 0.0	M_1–M_6: χ^2_d (1)= 1.32, p = 0.25
M_7	anonimity → intentions	χ^2 (176) =298.52, p = 0.0	M_1–M_7: χ^2_d (1) = 0.41, p = 0.52
M_8	PBC → intentions	χ^2 (176) =296.14, p = 0.0	M_1–M_8: χ^2_d (1) =2.79, p = 0.09
M_9	attitudes → contribution	χ^2 (176) =298.85, p = 0.0	M_1–M_9: χ^2_d (1) =0.08, p = 0.777
M_{10}	positive anticipated emotion → contribution	χ^2 (176) =298,39, p = 0.0	M_1–M_{10}: χ^2_d (1) =0.54, p = 0.462
M_{11}	subjective norm → contribution	χ^2 (176) =298.75, p = 0.0	M_1–M_{11}: χ^2_d (1) =0.18, p = 0.671
M_{12}	group norm → contribution	χ^2 (176) =297.78, p = 0.0	M_1–M_{12}: χ^2_d (1) =1.49, p = 0.222
M_{13}	social Identity → contribution	χ^2 (176) =298.92, p = 0.0	M_1–M_{13}: χ^2_d (1) =0.01, p = 0.92

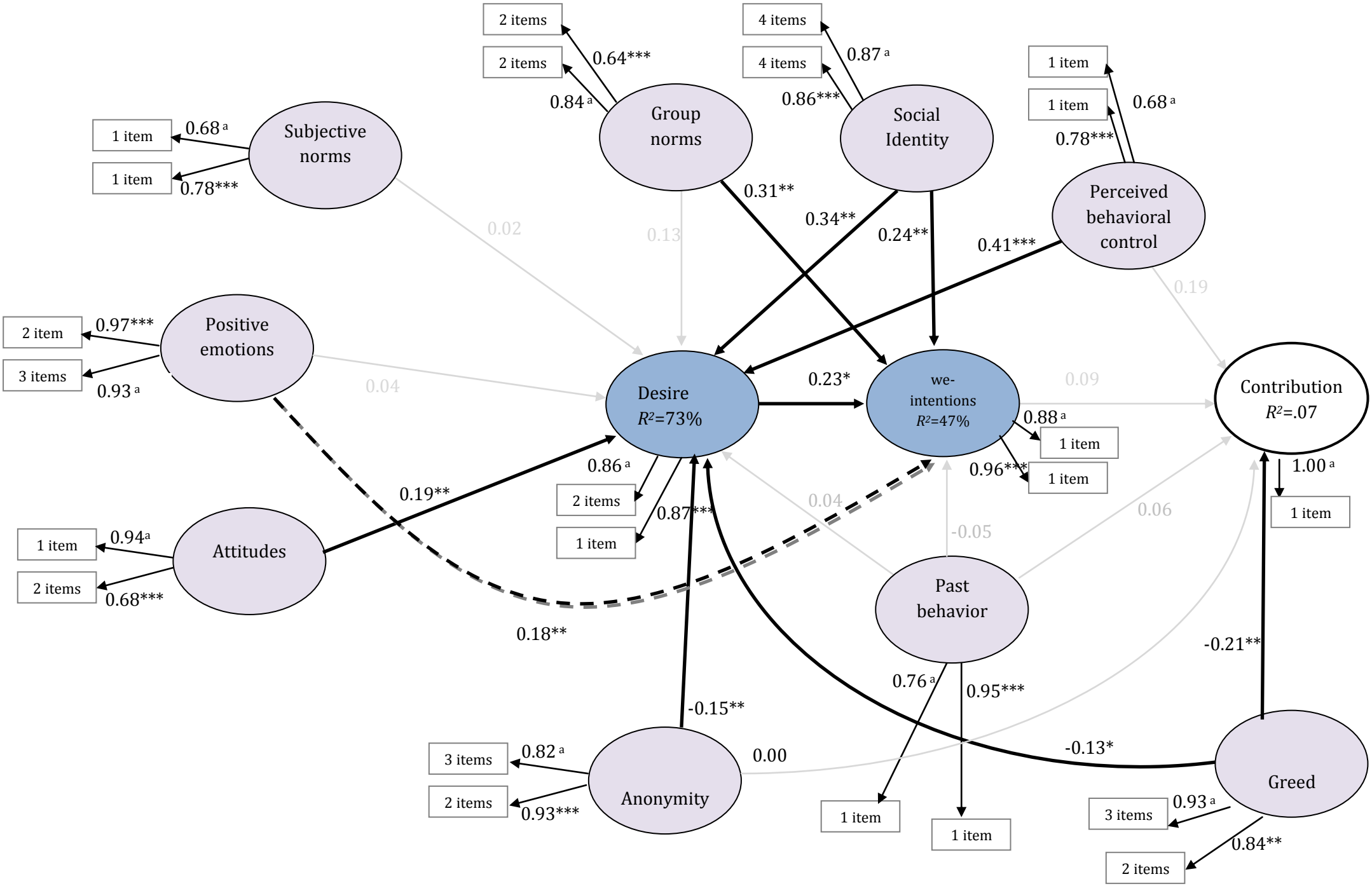

Figure 14 – Findings for augmented MGB model plus direct path from positive anticipated emotions to we-intentions, completely standardized parameter (N=250). Errors and correlations are omitted for the sake of simplicity. **Note:** *p < .05; **p < .01; *** p <.001; a = fixed parameter

3.8 Discussion

The most important good of a virtual community of practice is the shared knowledge, of which the community itself becomes the custodian. The principal aim of this study was to investigate the behavioral goal to contribute to a web community. For this research we used the theoretical framework of the model of goal directed behavior (Perugini & Bagozzi, 2001) plus social influence variables. We also borrowed the concept of we-intentions from Toumela's (1995) work. Additionally, in a augmented version of the MGB, we tried to understand what are the factors that may inhibit the performance of such a behavior (greed and anonymity).

A web survey was administered to the members of a community of practice, namely htcblog.com, and the behavioral goal was represented by the contribution assessed counting posts and comments written by the users. From the descriptive analyses we found that there was not a real behavior of contribution. Indeed, only 3% of htcblog.com users contributed to the community during a one-month period, and only 1,6% of the respondents showed to do it consistently. As mentioned in chapter 1, Nielsen (2006) explored empirically multi-user virtual communities, whose growth and development is entrusted by user's contributions, and proposed the so-called "1-9-90 rule" for the contents production in virtual environments. We found a similar distribution in our results. Recent community behavior research expressed the point that the long-term life of virtual communities depends critically on the proactive contributions of their members and that the individualistic motivations of members cannot fully explain their contribution behavior effectively (Bock et al. 2005). We believe that in order to design communities that have strong social interactions it is necessary to identify both the processes that encourage and inhibit the contents contribution process and participation. For the same reasons, some authors (Bagozzi, 2011; Bagozzi & Dholakia, 2002, 2006b; Bagozzi, Dholakia, & Mookerjee, 2006) investigated the nature of interdependence among virtual community members as we-intentions, group norms and social

identification with the group to better understand the factors that lead to participation in a web-community.

According to previous research (e.g., Bagozzi, 2011; Bagozzi & Dholakia, 2002, 2006a, 2006b; Bagozzi, Dholakia, & Pearo, 2006) using the MGB theoretical framework we found that attitudes, group norm, perceived behavioral control and social identity positively influenced the desire to contribute.

In the basic model (Figure 11) we also found direct effects of PBC and positive anticipated emotions on we-intentions. These significant effects imply that we-intentions mediate the effect of PBC and positive emotions on the contribution. In the Theory of Planned Behavior the construct of PBC affects intentions. As expressed by Perugini and Bagozzi (2001) the MGB subsumes the TPB, so it is plausible to hypothesize the effects of PBC not only on the desire to act, but also on the intentions. Bagozzi and Dholakia (2006a) and Chen et al. (2009) found similar results for the effects of PBC on intentions.

In the augmented model, we tested the MGB plus the effects of greed and anonymity. The direct effect of positive emotions on we-intentions did not change in the augmented MGB model (Figure 14). Thus, our sample emotional influences play an important role in explaining the behavior of contribution; this direct effect on we-intentions leads us to conclude that htcblog.com members experienced positive emotions toward the goal of contribution.

In both the basic and augmented MGB, past behavior and subjective norms did not show significant effects. Although previous research indicates that subjective norms play key roles in human behavioral processes, Dholakia and Bagozzi (2002, 2006a, 2006b) and Bagozzi (2011) found that subjective norms did not predict virtual group participation. Authors posit that usually participation in virtual communities is anonymous, and members can leave without much effort. Therefore, members of virtual communities may feel little need to comply with relevant referents' expectations.

Testing the original formulation of the MGB plus the collective intentions to act, desire captures the reasons for acting and transforms them into we-intentions to realize action together with all the members of the community. Thus, the development of we-intentions requires the influence of social identity and one of the reasons is that people need to belong to a group which increases their self-esteem (Bagozzi & Lee, 2002).

In our sample, desire predicted we-intentions to act, but we-intentions plus social influences variables did not predict the behavioral goal of contribution; furthermore, the model accounted only for the 4% of variance in the contribution behavior. As previous research suggests, the predictive power of models for behavioral prediction is often low (see Sutton, 1998; Wright, Velicer, & Prochaska, 2009); we think that this is especially true in the case of virtual contribution, which is a complex behavior: in order to be able to contribute, people have to subscribe to the community and then login in.

In addition to such technological barriers, other variables may be important to explain the inhibition in the transition from intention to behavior. With the introduction of two additional variables, greed and anonymity, we found that the total amount of explained variance for the actual behavior raise up to 7%; anonymity affected the desire to contribute, while greed directly influenced desire to act and contribution (see Figure 13). Our proposed model accounted for the 74% of variance in desire and 46% of variance for we-intentions. These accounts are in line with previous findings. For example, Bagozzi and Dholakia (2002) used the same theoretical model for describing the we-intentions to participate in a virtual communities and their proposed model explained the 77% of variance for desire and 69% for we-intentions.

It is worthwhile noticing that a plus in this study is that we used a direct observed measure of an actual behavior than out results. Bagozzi (2011) used a similar measure of an observed behavior and found that the MGB model plus we-intentions accounted for the 61% of variance in desire, 57% in we-intentions and 15% in the number of contributions; this model accounted for a higher level of variance in contribution behavior. We speculate that this difference is due to the type

of community analyzed. Bagozzi (2011) analyzed a community in which members share information about travel, sports, or life experiences with all the other members. Htcblog.com is structured more as a community to search for information and solutions to smartphone issues, than a virtual forum for the exchange of information with the other members. Our results lead us to think that there might be some processes that act prior to the performance of the behavior and somehow they might inhibit the willingness to contribute. Our hypothesis is that in community like htcblog.com, aimed at solving practical problems of using certain products, there is indeed a shared intention to collectively pursue the growth of the community. Although, variables acting at the individual level may inhibit such an intention. We speculate that users in this kind of community are driven mainly by the satisfaction of individual needs, like searching for technical solutions, that once satisfied are unable to provide the motivational drive to contribute in turn.

This interpretation could also be appropriate for our proposed model (Figure 14) that included the direct effect of greed and anonymity on desire and we-intentions to perform contribution in a virtual community. We suppose that greed and anonymity might act in two different ways.

The perception of being able to browse anonymously community's resources, may be sufficient to not to trigger the chain of desire-intention-action so that the contribution behavior is not performed; However, the perception of not being identified is something that is a priori (Christopherson, 2007); it is something that happens when the user is connected to the network, without necessarily being members of the community, and for this reasons its effects may first affect desire, as our results showed.

Greed has, by its nature, different behavioral implications. Typically we define a behavior as "greedy", when there is a desire to maximize ones outcomes. Within virtual communities of practice, users typically pose questions to other experienced users in order to solve their problems; users can also look for solutions previously offered by others. According to Bagozzi and Lee (2002), social action may be classified on a continuum in which at one extreme there are fully

cooperative actions, whereas on the other side there are minimally cooperative actions. A fully cooperative action refers to action, which need necessarily the full cooperation of all the other members to occur. A minimally cooperative group action refers to situations in which the members of a group have the same goal, but do not share a joint action to behave or cooperate together. We speculate that in such a situation group members, if influenced by the willingness to maximize a personal outcome, may lack the personal motivation, that is part of the original postulation of we-intentions (Tuomela, 1995), to carry out their own part of action, leaving to do their part in the process of knowledge contribution.

We note some limitations of this study. First, the supporting theoretical arguments and our longitudinal design support the likelihood that the relationships in the model are causal though only a replication of our findings experimental designs studies is able to establish a direction of causality absolutely. This is particularly important for the effects showed by the constructs of greed and anonimity on the observed behavior. Second, our study does not fully explain what are the motivations that drive users to contribute. Greed adversely affected the contribution behavior, but our general model explains only the intentions to contribute and not contribution itself. The gap between intentions and contribution behavior in a web community remains unresolved. Future research should focus on what are the psychological processes that inhibit the intentions to contribute and to identify variables that may explain the inhibition of this behavior.

4 CHAPTER 4 – Virtual participation

4.1 Introduction

Some studies showed that Web 2.0 itself does not always result in satisfactory outcomes and successful web communities (Shen, Lee, Cheung, & Chen, 2009). A study addressing an unsuccessful implementation of wiki-based collaboration suggested that the failure of a web community may not be due to the implemented technology but is instead due to a lack of collective participation (Davies, 2004). Recent empirical studies on web communities, however, still focused on the individual intention (Chiu, Wang, & Fang, 2009; Fang & Chiu, 2010; M. Hsu et al., 2007; Kang et al., 2007; Li & Lai, 2006; C. C. Wang & Cheng, 2006; Yu et al., 2010) neglecting the nature of interdependence among all participants, typical of a community. Other authors (Bagozzi, 2011; Bagozzi & Dholakia, 2002, 2006b; Baytiyeh & Pfaffman, 2010; Shen et al., 2009) showed that participation in a virtual community is to be regarded as a social phenomenon, driven by a collective intention to contribute, and to participate in the development of the community. The collective perceptions and factors influencing the intention formation process in the online participation processes deserve more attention in current research. For instance, Lampe and colleagues (2010) suggested that community members might continue to participate in a web community for different reasons than those that led them to the site. The authors found evidence that feelings of belonging to a site are important for both anonymous and registered users across different types of uses. Social and cognitive factors seem to be more important than issues of usability in predicting contribution to the site (Lampe et al., 2010).

4.2 Virtual community activities: Posting and reading contents

Understanding virtual community development provides a foundation for facilitating collaboration and learning among individuals separated by physical distance (Koh et al., 2007). For example, considering the development of technologies for organizations, the migration of offline communities into online virtual communities has the potential to greatly improve their efficiency

and ability to support the sharing of critical information and knowledge. Achieving this goal depends on the ability to develop and maintain communities in which individuals have both the opportunity and the motivation to participate and contribute (Koh et al., 2007). A virtual community can be seen as a group in which individuals come together around a shared purpose, interest, or goal (Rothaermel & Sugiyama, 2001).

Typical computer-mediated community interaction includes news and information sharing, problem solving, and routine communication. While members may also participate in chat conversations and face-to-face meetings, such interaction is not the major portion of virtual community activity. Most activity takes the form of posting or reading opinions, questions, information, and knowledge sharing within the community's message boards. Consequently, we can consider both active contribution and the use of community contents by reading as the fundamental elements in the ongoing life of any virtual community.

Lots of prior studies on knowledge contribution in virtual communities addressed the relationship between intention and contribution behavior. Previous research also suggested that virtual community participation constitutes a form of intentional social action; thus, the community member acts intentionally. The concept of we-intentions was brought into the theoretical frame of behavioral prediction, explaining the impetus provided by the intention of the action group. In literature, the construct of we-intentions is composed of two different statements (Bagozzi & Dholakia, 2002; Bagozzi, Dholakia, & Pearo, 2006; Bagozzi & Lee, 2002). On one hand we can consider the we-intentions to perform an action as an individual intention to perform a group activity with a group of people. The group activity is here viewed in an atomistic perspective and members of the group act individually to contribute to the group performance. On the other hand an individual views the group action holistically and it is the group that acts as a unit or, similarly, a person that acts as an agent of the group.

Bagozzi and colleagues (Bagozzi & Dholakia, 2002, 2006a, 2006b; Bagozzi, Dholakia, & Mookerjee, 2006; Bagozzi, Dholakia, & Pearo, 2006) suggested that the attraction of a virtual

community for a member derives from the collectivity, the positive experience of congregating and communicating in the mediated environment as a group (Postmes, Spears, & Lea, 2000). Consequently, virtual community members are likely to perceive themselves as members of the group, and form participation intentions in relation to this plural target. For instance, Bagozzi (2011) suggested also that the contribution behavior in a virtual community is influenced by the collective action to contribute by its members. Nevertheless, in a recent study, Shen and colleagues (2009) found that we-intention were positively related to knowledge contribution behavior in WikiProject, but I-intention negatively influenced knowledge contribution behavior.

We previously mentioned that most activity in a virtual community takes the form of posting or reading opinions, questions, information, and knowledge sharing. Thus, we considered the participation not only as contribution of content, but also as the activity to use the knowledge shared by others through reading community contents. In the literature on online participation, there is often an overlap between the role of readers and *free-riders* (Antin & Cheshire, 2010). The free-rider phenomenon occurs when, within a group of individuals, a member avoids giving its contribution to the common good because he/she believes that the group could live equally despite his abstention. This phenomenon takes its name from the people who use the public transport services without buying a ticket.

From a philosophical point of view, Tuomela (1992) defined the free-riding phenomenon. The author suggested that a member of a collectiveness intends to *free-ride* in relation to a public good produced by a joint action if and only if:

(1) The member intends to defect not contributing or doing his/her part of the collective action.

(2) The member has a belief that a sufficient number of members for the provision of the public good produced by the performance of the collective action will do their parts.

(3) The member believes that he/she ought to participate in the collective action

(4) A believes that he will gain more from defection than from contribution if at least a sufficient numeber of agents cotribute to the collective actions.

(5) A believes that the outcome resulting from all the agents contribution, is better than the outcome when all defect.

(6) A believes that his defection involves a cost (possibly nil) to the contributing members of the group.

Nevertheless, in a virtual community, a member may feel to participate just by reading contents, without necessarily contribute. For this assumption, it is necessary to differentiate between *reader-free-riders* and *reader-participants* (Antin & Cheshire, 2010). As expressed by Tuomela (1992) free-riders in the traditional sense, make informed decisions to take advantage of the efforts of others instead of giving their contribution. For instance, consider a scenario in which an individual reads a forum entry and notices errors, but he/she does not correct them because he/she does not know how the forum input system works. We can not consider a user who, for example, tries to correct a mistake in a forum entry as a free-rider because the traditional notion implicitly assumes an informed choice (Tuomela, 1992; Antin & Cheshire, 2010). Indeed, this user actually participates in the community, without necessarily contributing through the post of new contents.

The fact that a user takes information from the community may be sufficient to make him/her feel participating. This suggests that participation in a web community does not mean only active contribution. For this reason we assumed that the use of community contents by reading could be driven by different types of intentional forces. In this sense, reader-*participants* should express a stronger shared intention to read the contents of the community thinking about this action as something collective; reader-*free-riders* might express a greater individual willingness to use the contents of the community.

Starting from these assumptions, this second study investigated the different roles of I-intention and we-intention, and further to identify the possible antecedents and consequences of the two kinds of intention. We initially focused on the processes of contents contribution and then on the individual processes of using community's resources by reading contents. In the last part of the study we analyzed the participation in a web community. Thus, we considered participation as a

behavioral goal composed by both the instrumental behavior of active contribution and the use community's resources by reading contents. In the following paragraphs we will use the words "use community's resources by reading contents", "use of community contents by reading" and "use of community contents" as synonyms.

4.3 The hypothesized models

4.3.1 MGB : Active contribution and the use community contents

In Figure 15 we present our hypothesized model for the active contribution behavior and for the use community contents by reading behaviors. Following the MGB framework (Bagozzi & Dholakia, 2002; Bagozzi, Dholakia, & Mookerjee, 2006; Bagozzi & Lee, 2002; Perugini & Bagozzi, 2001) we assumed that both these target behavior would be directly mediated by both I-intentions and we-intention to act.

We expected desire to perform a behavior to be a proximal determinant of both I-intentions and we-intentions. We hypothesized that also attitudes, subjective norms, PBC, past behavior, group norms and social identity would have significantly influenced desire. As suggested by Dholakia and Bagozzi (2002, 2006a, 2006b, 2011), social identity and group norms should affect the desire to act and the we-intentions whereas it should not influence I-intentions to perform the target behavior. We hypothesized the behavioral goals, I-intentions and we-intentions to be influenced also by the effects of past behavior and perceived behavioral control variables. We did not include the emotional influences variables in these models (see Figure 15).

4.3.2 Model for participation behavior

We hypothesized that online participation might be expression of two different behaviors: content contribution and the use of community contents by reading. As expressed by Antin and Chesire (2010) and by Shen et al. (2009), readers can be divided into *reader-free-riders* and *participant readers*; Shen and colleagues found that I-intention negatively influenced contribution behavior if measured together with we-intentions. We hypothesize that this negative relationship

between I-intentions and contribution behavior might be due to *free-riders*. Therefore we assumed that there might be different behavioral goals that lead a user to access a web community, but not all of them lead to participation (see Figure 16).

According to what suggested by Antin & Cheshire (2010), we can identify two different modes for community access. We can hypothesize that users join a web community either for posting new comments and contents but also to access and read contents entered by other users. Both these behavioral goals should determine a most general sense of participation in the community life.

We assumed that in a discussion forum, the use of contents is driven mainly by the I-intention to access contents, taking advantage of the contribution made by others. A shared intention to use community resources by reading contents would express instead a form of participation, for example in the process of contents revision.

For these reasons, we hypothesized that the desire to contribute would predict I-intentions and we-intentions for contribution; the latter would predict we-intentions to participate, and contribution behavior.

We speculate that a similar process could explain the behavioral goal of using community contents: desire will predict individual and shared intention to use community contents. We-intentions to read contents should predict we-intentions to participate, whereas only I-intentions to read contents should predict the individual reading contents behavior.

Finally, we hypothesized that participation process might be affected by we-intention to participate. The participation goal should be positively predicted by the we-intentions to contribute and negatively influenced by the individual use community resources by reading behavior (see Figure 16). Positive and negative anticipated emotions (emotional influences) would predict the goal of participation.

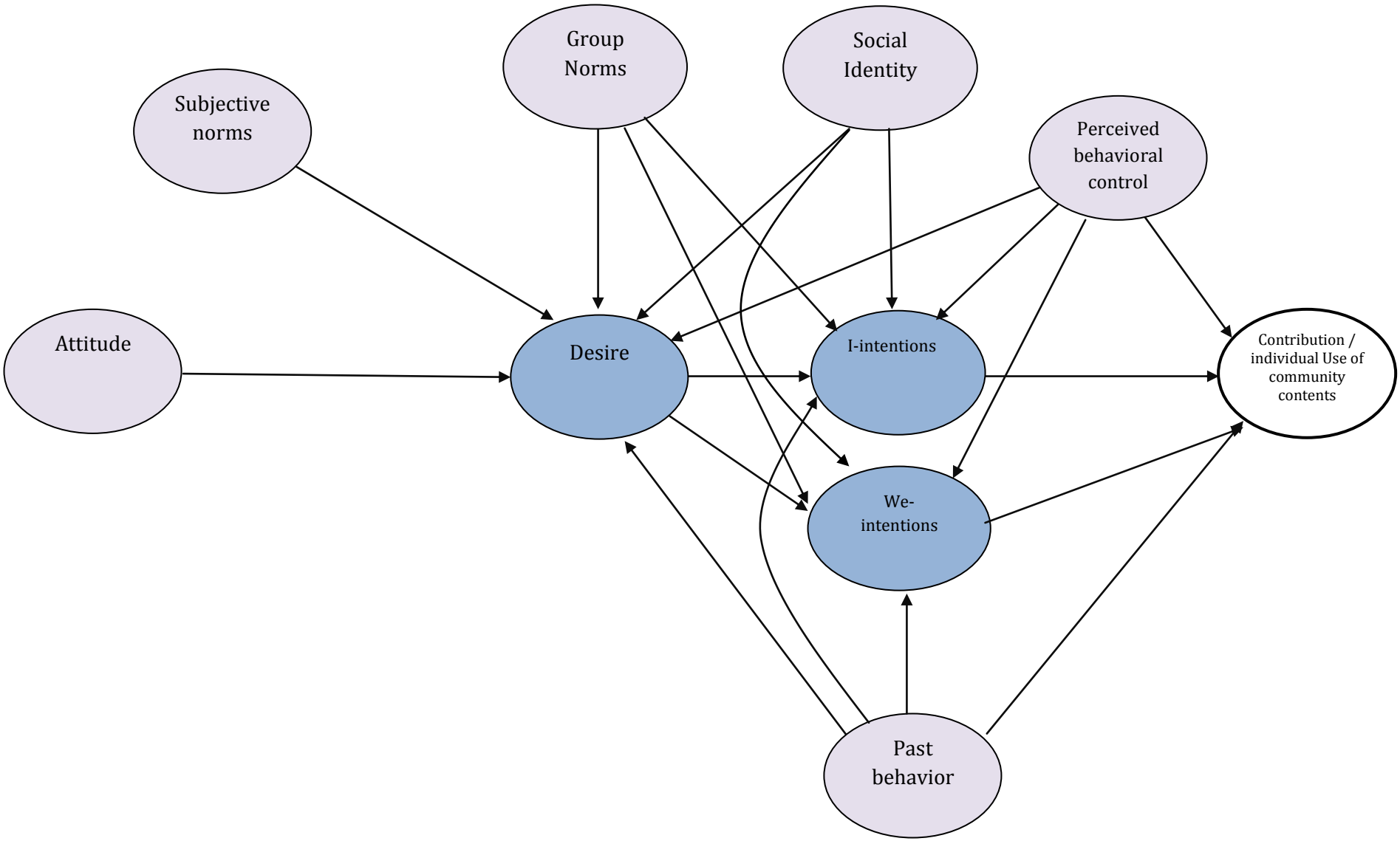

Figure 15. Hypothized MGB for contribution and for the use of community contents by reading

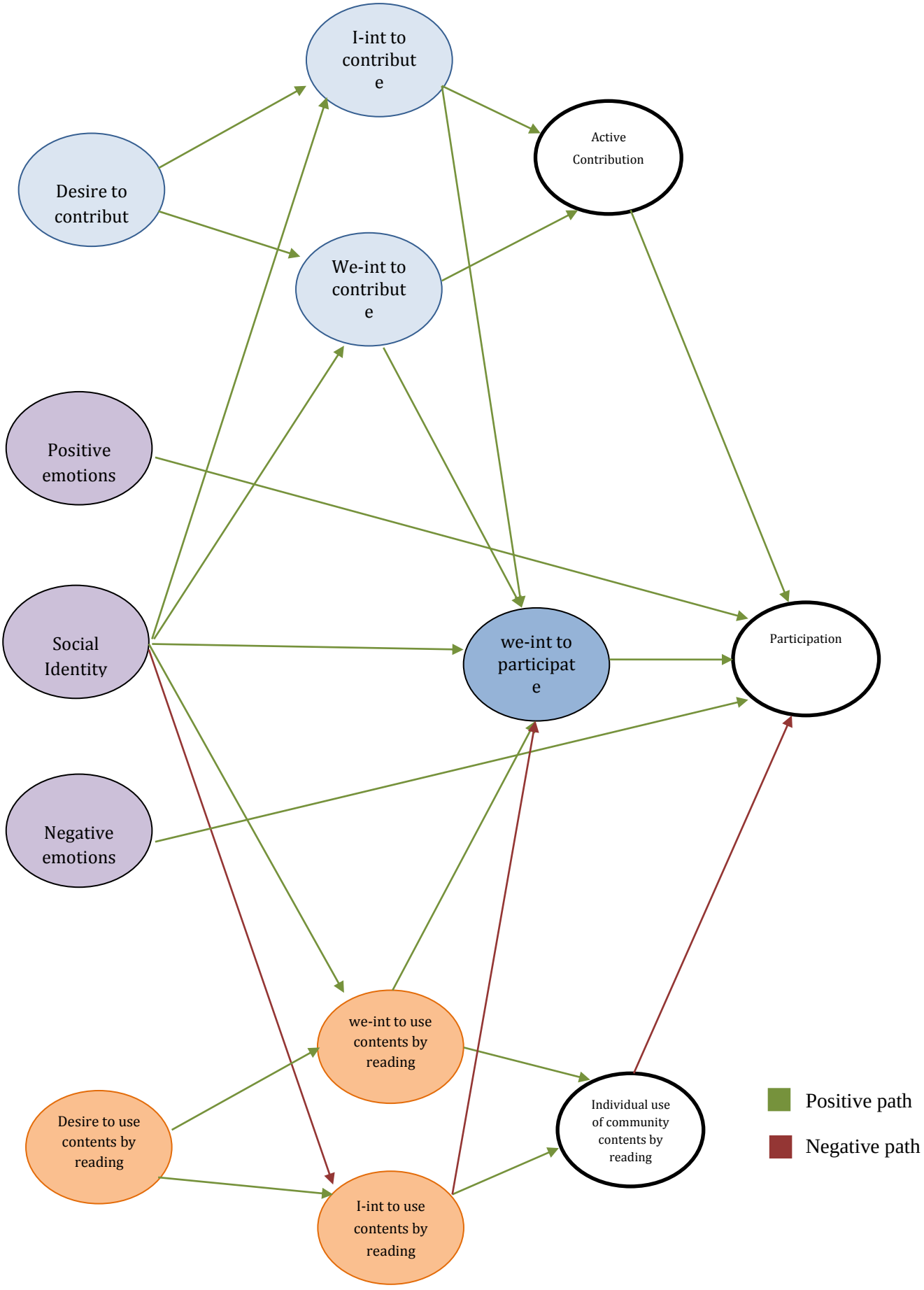

Figure 16. Hypothized model for participation behavioral goal

4.3.3 The role of greed

In chapter 3 we suggested that the construct of greed might inhibit the process of active contribution within a web-community. In this second study we hypothesized that the construct of greed might affect the willingness to participate; in particular we assumed that greed could positively predict an individual use of community resources by reading while it might adversely affect the active contribution process (see Figure 17). As already described in Chapter 3, we defined the construct of greed as the desire to maximize the outcomes for the individual that we can define as a sort of internet free-riding (see Tuomela, 1992 for a theoretical reflection on the free-riding dynamics).

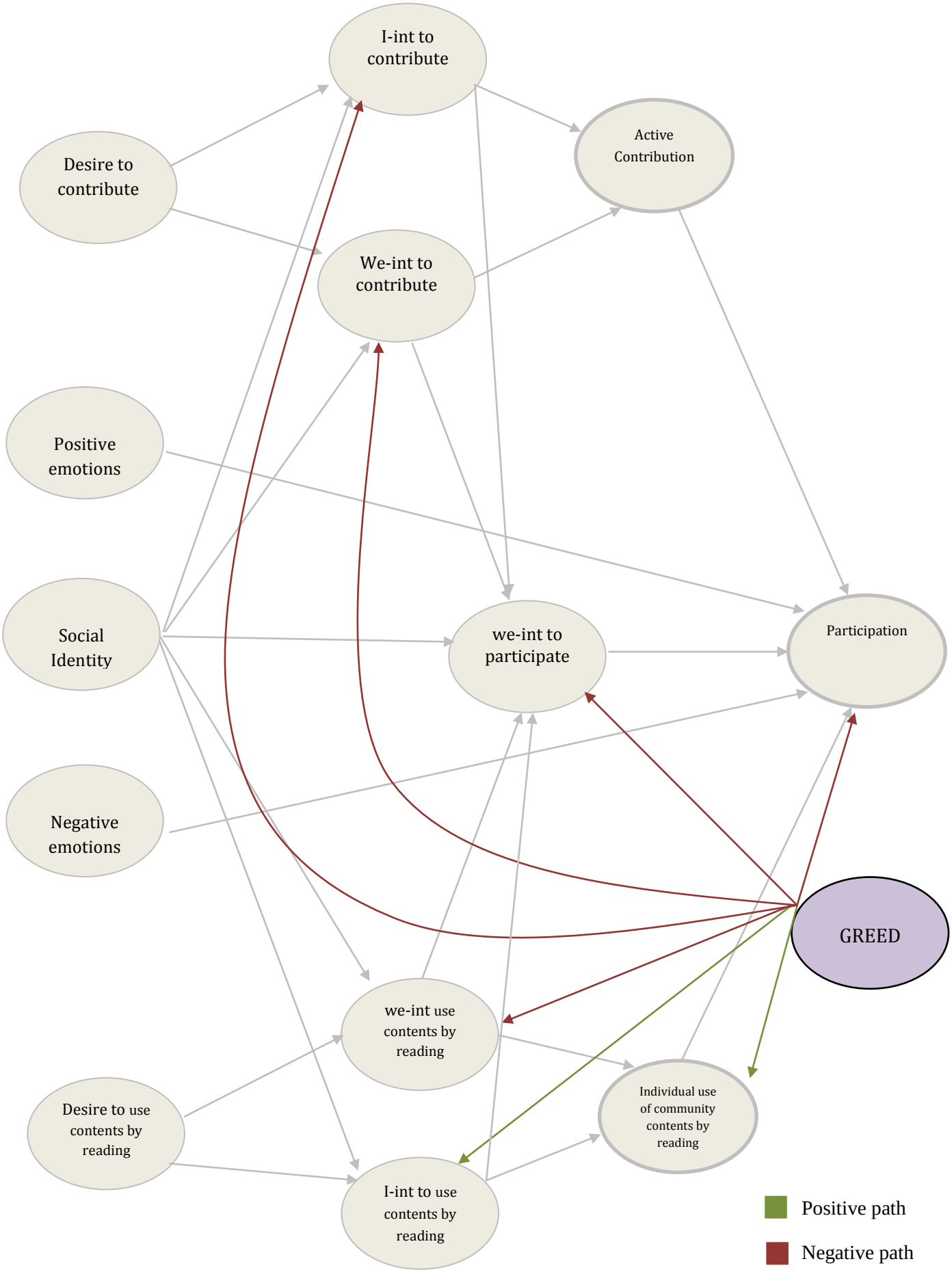

Figure 17. Hypothized model for participation behavioral goal plus greed effects

4.4 Method

4.4.1 Procedure

Data collection was performed on a single online community, named PIPAM – Pagina Italiana Pesca a Mosca (http://www.pipam.org). During the period of data collection (May 2011 – June 2011), PIPAM community was composed approximately by 7.000 registered members. The web community has been active since 1995 and it has become a reference point for all fly-fishers in Italy.

As in most other web communities, in order to become a member, users must register by choosing their own nickname. Community members share information on fishing techniques and about their experiences in fly-fishing. Users often share their thoughts spontaneously and pose open questions searching for a solution by other members. All the exchanged messages are visible to all other members and are accessible through the home page of the forum.

As in the previous study, we chose a longitudinal design. At Time 1, data collection was carried out with an ad-hoc web-survey (Gabbiadini, Mari & Volpato, 2010) programmed with the PHP Language; we used the support of a MySQL database in order to record the responses for each participant. We chose to use a similar graphic design to the one used by PIPAM website, in order to not to confuse the respondents in the transition from the web-pages of the community to the online survey, providing greater credibility. The survey was hosted on a private server separated from the community's server. We collected data with members' consent and coded them immediately after the survey collection. Before beginning, we obtained collaboration and all the necessary permissions from the community administrators. The community webmaster granted the privacy of the personal data treatment. The webmaster also inserted a banner (with a hyperlink to our web-survey) on the forum, at the top of the home page and in the sidebar of the community website to explain the purpose of the survey and to encourage participation, as well as to guarantee the confidentiality of all responses.

Participants logged into the survey by the nickname they used for the community, and to avoid double entries, we recorded each respondent's nickname and the time of survey completion. No other personal information were requested or registered. A message related to the processing of personal data and privacy protection was presented in the first page of the survey. To encourage community members to complete the questionnaires, we launched a competition with five prizes for a total value of 150€.

On the first page of the questionnaire we stated that the study aimed to investigate three different behaviors: (1) the use of the contents of PIPAM, for example by reading the pages of the forum; (2) the active contribution to the community, such as writing new content, new thread, or comments to other threads; (3) the participation in the life of PIPAM, by reading or writing contents. For this reason we arranged the scales for measuring the constructs of the two MGB on different pages of the questionnaire so that the respondent could understand that they were related to different behavioral goals. At the top of every section there was a message that indicated what was the investigated behavioral goal for that specific part of the survey.

Consequently, the questionnaire (T1) was structured into four parts; we used the first part of the measures to test the MGB for the contribution behavioral goal; in the second part we used items to measure both anticipated negative and positive emotions toward participation, social identity and the construct of greed. In the third part of the questionnaire we tested the MGB for the use of community contents by reading on PIPAM; in the last part of the questionnaire we included measures for the intentions and desire to participate in the life of the community and for the participation behavior. Furthermore, the web server automatically randomized the first and the third part of the questionnaire, in order to balance the presentation of the items for the two investigated behavioral goal of contribution and enjoyment of contents.

We were interested in understanding the factors that determine the participation in a web community, so also the responses of users who exclusively consult the pages of the forum were essential. For this motivation in the first page of the survey we explicated the following sentence:

“If you typically do not write on the forum, but you usually read its contents, please fill out the questionnaire, as also your opinion of "user" is very important to understand the sense of participation in a web community as PIPAM”.

In the follow-up phase (T2) about fifty days later the administration of the questionnaire, the community administrators gave us access to the website database that hosts the community. As in the previous study, we analyzed the actual contribution of every single user. For every respondent we counted the number of posts and interventions recorded on the forum. To do this, we double-crossed the date in which every user completed the questionnaire and his/her nickname. In this way it was possible to encode the actual behavior of every respondent for the month after he/she complete the questionnaire.

4.4.2 Sample characteristics

A total of 428 participants completed the survey (T1). 414 of the community members were male (96.7%), 3 were female (0.7%) and 11 missing data (2.6%). Their mean age was 42 years (M = 42.16, SD = 11.36).

The average access to the community, measured on a categorical scale with 4 intervals, shows that 74.5% of total users accessed the community one time per day, 17.1% more than one time per day but less than five time a week, 8.2% more than five times a week but less than 15 times per month and 0.2% join the community less than 15 times a month (M = 3.66, SD = 0.635).

In terms of membership duration, 6.6% had joined PIPAM less than three months before, 3.9% had joined the community between three and six months before, 8.7% had been a member for over six months and less than one year, 17.2% more than one year but less than two years and 63.6% had been a registered user for over 2 years (M = 4.27, SD = 1.18).

4.4.3 Measures

As mentioned above, our questionnaire was divided into four logical parts: (1) MGB measures for the contribution behavioral goal measures, (2) anticipated emotions, greed and social identity measures (3) MGB measures for the use of contents by reading measures, (4) measures of participation's desire, we-intentions and behavior. As a result, many scales, in particular those relating to the measures for the different MGB models, were repeated. Thus, in the following paragraphs similar measures will be presented once, with the indication of three different behavioral goals to which they referred.

Attitudes toward the contribution

We measured the construct of attitude for the behavioral goals for contribution and of using community contents by reading. Attitudes toward the behavioral goal were assessed using six 7-point semantic differential items: *Useless – Useful*, *Foolish – Wise*, *Unpleasant – Pleasant*, *Boring – Fun*, *Negative - Positive*, *Bad – Good*. Scales were anchored by 1 assigned to the negative pole and 7 to the positive one, with 4 indicating *neither agree / nor disagree.* The items were introduced by the sentence *"*Writing in PIPAM new content, new thread, or comments to the discussions of others / Use the contents of PIPAM, such reading the forum or other's comments, in the next month, would be….".

Positive and negative anticipated emotions toward participation

As suggest by Perugini and Bagozzi (2001) anticipated emotions are related to the behavioral goal (see also Leone, Perugini, & Ercolani, 2004). For this reason we considered anticipated emotions toward participation and not the emotional influences for contribution and for the use of contents by reading; emotions were measured with a 7-point scale ranging from *not at all* (1) to *very strongly* (7). Emotions were introduced with the following statement: "If I could participate in the life of PIPAM, for example writing or reading the content on the forum during the next month, I would feel…" and then we presented a list of four positive emotions (*happy, satisfied, proud, pleased*). A list of the four negative emotions was introduced by a similar sentence "If I

could not participate in the life of PIPAM, for example writing or reading the content on the forum during the next month, I would feel…"; The four negative emotions were expressed by the degree in which the respondent will feel *sad, angry, sorry or frustrated*.

Identification

In order to measure identification with the community group, we used eight items (Capozza, Brown, Aharpour and Falvo, 2006) followed by a 7 points scale, anchored with (1) *strongly disagree*, (7) *strongly agree*, and (4) that means *neither agree / nor disagree*. The items were expressed by the following sentences: "I evaluate positively being a member of PIPAM" ; "Being a member of PIPAM provide me with prestige"; "I feel tied the other members of PIPAM"; "I feel attached to the other members of PIPAM"; "Being one of PIPAM members is something I often think about"; "I often think of being a member of PIPAM during the day "; "I do not usually behave as a typical member of PIPAM"(reversed score); "I would feel uncomfortable if the media (TV, newspapers, websites) criticized the members of PIPAM".

Group norms

Group norms related to contribution goals were measured on a 7-point scale (Bagozzi & Dholakia, 2006b, 2006a; Bagozzi et al., 2007) in which the degrees represented (1) *not at all*, (7) *very strongly*, and (4) represented *quite enough*. We measured group norms for the instrumental behavior of active contribution and for the individual use of community contents by reading. Items were introduced by the following sentence: "Write new contents, new threads or comments on the discussions of others in PIPAM / Use contents, new threads or comments by reading in PIPAM, with other people who have similar interests can be considered as an instrumental behavior. For the listed community members, please estimate the strength with which everyone pursues this behavior". We then measure group norms toward contribution / use of contents by reading on three different levels, which represented the different roles that one member could have in the community asking (a) the strength of one self's goal, (b) the strength of an active member's goal, (c) the strength of a reader member's goal and (d) the strength of administrators of the community's goal.

Subjective norms

To measure subjective norms for contribution and for the use of community contents by reading, the following 7-point items (Bagozzi & Dholakia, 2006a, 2006b; Perugini & Bagozzi, 2001) were employed: "Most people who are important in my life think that *I should* / *should not* write in PIPAM new content, new thread, or comments to the discussions of others / use the contents of PIPAM, such as by reading its pages or the forum, during the next months". The second item "Most people who are important to me would *approve* / *disapprove* of me writing in PIPAM new content, new thread, or comments to the discussions of others / use the contents of PIPAM, such as by reading its pages or the forum, during the next months".

Perceived behavioral control

Two items were employed (M. Perugini & R. P Bagozzi, 2001) for measuring PBC for contribution and for the use of community contents by reading. The first one was "How much control do you think you have over inserting one or more comments or new topics in PIPAM / using the contents of PIPAM, such as reading its pages or the forum, during the next months?". A 7-point scale ranging from (1) *no control*, to (7) *total control*, and the midpoint (4) *moderate control*, followed. The second item was expressed in the form "How much easy or difficult do you think it is for you, entering one or more comments or thread on PIPAM / using the contents of PIPAM, such as reading its pages or the forum, during the next month?" measured with a 7 points scale ranging from (1) *very difficult* to (7) *very easy.*

Past behavior

To access the frequency of past contribution behavior and past use of community contents by reading, the following item was used "How often in the past, did you contribute writing in PIPAM new content, new thread, or comments to the discussions of others / did you use PIPAM contents by reading ?" measured on a 5-point scale : (1) *Daily*, (2) *Sometimes a week*, (3) *A few times a month*, (4) *About once a month*; (5) *Less than once a month*. Recency of past behavior was measured with the item "How often during the last month, did you contribute by writing in PIPAM

new content, new thread, or comments to the discussions of others / did you use PIPAM contents by reading?" followed by the same 5-point scale.

Desire

Three items, measured on a 7-point scale, were used to measure the desire to perform a specific behavior (see e.g. Bagozzi & Perugini 2001). We measured the construct of desire for the behavioral goals of contribution and for the use of community contents by reading. The first item was "I desire to contribute to the contents of PIPAM and add comments to the discussions of the community / to use the contents of PIPAM by reading, during the next month", where 1 indicates *strongly disagree*, 7 *strongly agree* and 4 indicates *neither disagree / nor agree*. The second item was expressed with the sentence "My desire for contributing to the contents of PIPAM and add comments to the discussions of the community / to use the contents of PIPAM by reading, during the next month can be described as…." for which participants selected one of 7 different options: (1) *no desire*; (2) *very weak desire*; (3) *moderate desire*; (4) *quite strong desire*; (6) *strong desire*; (7) *very strong desire*. The third item was the following statement: "I would like to contribute with others by entering one or more comments in htcblog.com / to use the contents of PIPAM by reading, during the next month. This assertion: *do not describe me at all* (1) – *describe me at all* (7). The midpoint (4) indicated "*It describes me moderately*".

We-intentions

We used two items adapted from Bagozzi and Lee (2002) to measure we-intentions to perform a behavior: "I intend that our group, me and the other members of PIPAM as a collectivity, contribute to the contents of the community and add comments to the discussions on the forum / use the contents of the community by reading / intend to participate in the life of the web-community, writing or reading the content on the forum, during the next month." The second item was "We, that is me and the other members of PIPAM as a collectivity, intend to contribute to the contents of the community and add comments to the discussions on the forum / use the contents of the community by reading / intend to participate in the life of the web-community, writing or reading the content on

the forum, during the next month". Both items were followed by a 7-point scale in which 1 indicated *strongly disagree* and 7 indicated *strongly agree* (4 = *neither agree / nor disagree*).

I-intentions

We used two items adapted from Perugini and Bagozzi (2001) to measure I-intentions to reach a goal. We measured the I-intentions to contribute and the I-intentions to use community contents by reading "How likely is your intention as an individual in the next month to contribute to the contents of PIPAM, for example by adding new comments or new discussion on the forum / to use the contents of PIPAM, for example by reading its pages or reading the forum, in the next month?" and "As an individual I would like to contribute to the contents of PIPAM, for example by adding new comments or new discussion on the forum/ to use the contents of PIPAM, for example by reading the pages or the forum, during the next month". Both items were followed by a 7-point scale in which 1 indicated *strongly disagree* and 7 indicated *strongly agree* (4 = *neither agree / nor disagree*).

Greed

As in study 1 for measuring greed we used a reduced version (five items) of the scale proposed by Markòczy (2007), on a 7-point scale ranging from (1) *strongly disagree*, to (7) *strongly agree*, and the midpoint (4) *neither agree nor disagree*. The items of the scale were "By not contributing with comments on PIPAM, I won't end up worse off than anyone else"; "If everyone else contribute a lot with comments on PIPAM, then I get the best of both situations if I don't"; "If others put a large effort into contribution on PIPAM and I don't, that is my gain and their loss"; "Let the *suckers* put a lot of effort into contribution on PIPAM"; "By not contributing with comments on PIPAM, I'll come out better off than those who conserve a lot".

Behaviors

The main dependent variable in this study was the *participation behavior*, which represented the way members feel to participate in the life of the community with other members.

To measure this behavior we extended the items proposed by Shen et al. (2009). Six items were used: "I usually spend time to participate in the life of PIPAM, reading or writing contents on the forum"; "I participate in the web-community, reading other's comments or threads and replying them offering my knowledge"; "I make myself involved with discussions and with the exchange of knowledge on the forum: I think that doing so we are participating in what is meant by participate in a web-community" and "I participate in the life of PIPAM, reading the various ideas written by others expressed on the forum". Finally, "I participate in the life of the community, putting my ideas or my solutions on the forum, knowing that others will read them"; "I participate in the life of PIPAM, whether I write on the forum or I read contents posted by other users" (Shen et al., 2009)

To measure the individual use of contents by reading, we created five different items: "I usually spend some time reading the contents and messages on PIPAM forum"; "I just read the opinions of other members, rather than putting my thoughts on the forum", "I use the contents of PIPAM and its forum by reading, rather than writing on it"; "I don't like to get involved in disputes over PIPAM, I just use its contents by reading"; "I usually read the comments of other users on PIPAM forum". All the items were measured by a 7-point scale in which 1 indicated *strongly disagree* and 7 indicated *strongly agree* (4 = *neither agree / nor disagree*).

Finally, to measure the contribution behavior we considered the number of messages posted on the forum of PIPAM. For every participant we considered his/her contribution in the month following the date in which he/she completed the questionnaire.

4.4.4 Data analyses

Confirmatory Factor Analysis (CFA) was used to test the adequacy of the model measurement and to verify the discriminant validity of the constructs. Structural Equation Modeling (SEM) was used to test the proposed theoretical framework. In both cases (CFA and SEM) the LISREL 8.54 software was employed (Jöreskog & Sörbom, 1999). The goodness-of-fit of the estimated models was assessed with χ^2 test in which satisfactory fits were obtained when the test

was non-significant. Other indexes were examined as well: the root mean square error of approximation (RMSEA), standardized root mean square (SRMR), and the comparative fit index (CFI). Satisfactory model fits are indicated by RMSEA and SRMR values less than or equal to .08, CFI values greater than or equal to .90 (Bagozzi & Yi, 1988; Bearden et al., 1982; Hu & Bentler, 1999). Discussions of these indices may be found in Bentler and Bonett (Bentler, 1990; Bentler & Bonett, 1980), Browne and Cudeck (1993), and Marsh, Balla, and Hau (1996).

As in the previous study all analyses were performed on covariance matrices. In order to yield models with less parameters to estimate, for latent variables with more than two items, these were combined to produce two indicators (see Table 11), using a partial disaggregation model (Bagozzi & Heatherton, 1994). Item parcels were created by averaging multiple measures. Models were also compared for their predictive power by inspecting the R^2 within each model. In contrast, the chi square test difference was applied for nested models.

4.4.5 Results

We first verified that the data collected for each variable were normally distributed and all the variables showed a Gaussian distribution. We then checked the internal consistency for all the constructs. All the alpha values were satisfactory, except for the measure of social identity, group norms for contribution, behavior of use of content by reading and participation behavior. In these cases we excluded one item from each scale. In particularly we excluded Item 3 (reversed item) for the social identity scale (alpha improved from .78 to .88), item 3 for the contribution group norms scale (alpha improved from .60 to .75), item 1 for reading behavior (alpha improved from .79 to .87) and item 6 for participation behavior (alpha improved from .79 to .87).

After looking for an adequate internal consistency for each measure, we calculated composite scores for each scale. In addition, t-test was used to verify whether the mean scores were significantly different from the midpoint of the respective scale. Results indicate that all scores

resulted different from the midpoint. Table 7 summarizes alphas, means, standard deviations, t-values and significance for each scale.

Table 7 – Reliabilities, means and standard deviations for each construct

	α	***M***	***SD***	**t**	***p***
Attitudes toward contribution	.94	5.78	1.15	32.09	.000
Group norms for contribution	.75*	4.63	1.10	11.82	.000
Subjective norms for contribution	.81	4.93	1.28	15.15	.000
Past contribution behavior	.83	3.08	1.48	-12.74	.000
PBC for contribution	.78	4.28	1.38	4.29	.000
Desire to contribute	.86	4.17	1.28	25.04	.000
I-intentions to contribute	.90	4.26	1.60	3.37	.001
We-intentions to contribute	.92	5.31	1.18	22.93	.000
Attitudes toward individual use of contents	.93	6.00	1.05	39.13	.000
Subjective norms for using contents	.80	5.21	1.23	20.36	.000
Past behavior for the use of contents	.80	5.61	1.20	27.82	.000
PBC for the use of contents	.73	5.29	1.11	24.07	.000
Desire to use contents	.78	5.29	1.06	16.25	.000
We-intentions to use contents	.92	5.72	1.03	34.40	.000
We-intentions to participate	.93	5.31	1.26	21.45	.000
I-intentions to use ocontents	.85	6.03	1.01	41.23	.000
Positive anticipated emotions	.87	4.39	1.51	5.42	.000
Negative anticipated emotions	.94	2.93	1.46	-14.95	.000
Greed	.85	2.23	1.14	-31.75	.000
Social identity	.88*	4.33	1.29	5.35	.000
Individual use of contents by reading behavior	.87*	4.79	1.42	11.59	.000
Participation behavior	.87*	4.81	1.27	13.12	.000

Note: Cronbach's alphas, means and standard deviations for each scale. Degree of freedom for each t-test = 427 except for we-intentions to participate = 425.

*1 item exluded

For all measures mid-point=4.

Preliminary analysis considerations

Contribution behavior

Our analysis of comments posting frequency on the forum of PIPAM, indicated that 41.1% of the respondents never posted messages or comments during the considered period of our data collection. 35.1% posted fewer than 10 times, 19% contributed more than 10 times but less than fifty times, and only 4.8% contributed more than fifty messages or comments (M = 9.98 SD = 21.36). As we can see from the means and from the significance of the t-tests, respondents declared to consider contribution on PIPAM as useful and positive, showing a positive attitude toward contribution. The perceived social pressure is mildly considerable: referents are expected to approve this behavior. PIPAM users, declared to feel a moderate desire to contribute in the following month, during the period of our study; they also declared their will and intentions to contribute to the community contents.

Use of contents by reading behavior

PIPAM users who responded to our survey showed a strong attitude toward the use of community contents by reading; they declared to consider the use of contents by reading of PIPAM as useful, positive and pleasant, showing a positive attitude toward contribution. Also in this case, the subjective referents were expected to approve this behavior. Members declared to feel a strong desire to use by reading the contents of the community, during the one-month period of our study.

Social and emotional influences

Social identity mean is significantly higher than the midpoint of the scale, showing that respondent feel a moderate but significant identification with the other members of the community. Looking at the emotions, the anticipation of success for participating produces emotions of happiness, satisfaction, proud and pleasure. As expected, the anticipation of failure did not produce considerable negative feelings, as for example sadness or frustration. Finally, respondents showed a moderate level of greed.

I-intentions and We-intentions

PIPAM users showed strong collective intentions to participate in the life of the community. A *t*-test ($t(425) = 15.72$, $p < .001$) showed that there was a significant statistical difference, between I-intentions and we-intentions to contribute on PIPAM. We found a similar statistical result between I-intentions and we-intentions to use contents by reading ($t(425) = -7.38$, $p < .001$). Respondents showed more I-intentions and we-intention for using contents by reading than I-intentions ($t(425) = 23.65$, $p < .001$) and we-intentions ($t(425) = 8.034$, $p < .001$) for contributing. Respondents showed more I-intention to use community contents than we-intentions to participate ($t(425) = -13.02$, $p < .001$) and a higher value for we-intentions to read community contents than we-intentions for participation ($t(425) = 7.595$, $p < .001$).

A final *t*-test ($t(425) = 0.16$, $p = .873$) showed that there was no statistical difference between we-intention to contribute and we-intentions to participate.

4.4.6 Confirmatory analyses

We assumed that the behavioral goal of web-participation might be driven by two different behaviors. In order to deeper understand community participation, in the following paragraphs we will consider the behavioral goals of contribution and the use of community contents by reading as two separate instrumental behaviors. After this, we will proceed with the description of the model regarding participation.

4.4.7 Distinction between intentions and desire for participation, contribution and reading

The distinction between the desire and intentions for each behavior, and the distinction between each similar construct for the three goals in our study was crucial for our research. For this reason we decided to conduct a deeper analysis of the discrimination between seven constructs: (1) contribution desire (2) contribution I-intentions, (3) contribution we-intentions, (3) use of contents by reading desire (4) I-intentions and (5) we intentions for using contents by reading, (6) we-intentions to participate and (7) participation behavioral goal. The CFA, obtained a good fit: χ^2 (56)

= 93.05, p ≈ 0.0014; RMSEA = 0.041; SRMR = 0.023; CFI = 0.99. Factor loadings were all high and consistent (see Table 8 for the correlation matrix of parceled items and Table 9 for factor loadings). Convergent validity for the five constructs was achieved because the measures loaded only on the respective factor. Discriminant validity, instead, emerged from the fact that latent variables showed correlations lower than 1.0 (see Table 10). We obtained critical values of correlation between the following variables: using contents I-intentions and using contents desire (ϕ = .80, $p < .001$; SE =.03), using contents we-intentions and using contents desire (ϕ = .77, $p < .001$; SE = .03), using contents I-intentions and using contents we-intentions (ϕ = .75, $p < .001$; SE=.03), contribution I-intentions and contribution desire (ϕ = .83, $p < .001$; SE = .02), contribution we-intentions and contribution desire (ϕ = .69, $p < .001$; SE = .03). The confidence interval, obtained by considering two standard errors above and two standard errors below the estimate correlation, did not include the perfect correlation in any case out of twenty-eight.

Table 8 - Correlation matrix of parceled items – part A

C_attitude1	1,000																	
C_attitude2	,896**	1,000																
C_sobjective_norms1	,420**	,431**	1,000															
C_sobjective_norms2	,380**	,422**	,684**	1,000														
C_PBC1	,149**	,153**	,170**	,224**	1,000													
C_PBC2	,248**	,236**	,245**	,296**	,644**	1,000												
C_desire1	,564**	,582**	,453**	,395**	,294**	,302**	1,000											
C_desire2	,434**	,463**	,393**	,300**	,301**	,276**	,765**	1,000										
C_i_intentions1	,400**	,438**	,416**	,413**	,413**	,396**	,682**	,630**	1,000									
C_i_intentions2	,426**	,450**	,409**	,378**	,411**	,415**	,734**	,653**	,842**	1,000								
C_we_intentions1	,447**	,487**	,364**	,353**	,199**	,233**	,593**	,480**	,430**	,502**	1,000							
C_we_intentions2	,452**	,501**	,383**	,357**	,256**	,250**	,620**	,502**	,511**	,565**	,858**	1,000						
C_past_behavior1	,179**	,217**	,195**	,177**	,480**	,374**	,455**	,504**	,587**	,496**	,235**	,257**	1,000					
C_past_behavior2	,227**	,237**	,222**	,204**	,377**	,319**	,513**	,521**	,647**	,582**	,278**	,320**	,714**	1,000				
C_group_norms2	,230**	,273**	,244**	,237**	,113*	,143**	,224**	,147**	,176**	,163**	,348**	,378**	,119*	,107*	1,000			
C_group_norms3	,238**	,295**	,175**	,195**	,072	,104*	,208**	,163**	,137**	,143**	,282**	,295**	,069	,012	,610**	1,000		
contribution behavior	,097*	,131**	,058	,011	,235**	,193**	,331**	,341**	,408**	,360**	,135**	,196**	,516**	,571**	,050	,008	1,000	
U_attitude1	,653**	,611**	,370**	,332**	,041	,140**	,432**	,308**	,280**	,311**	,439**	,442**	-,004	,052	,269**	,302**	,008	1,000
U_attitude2	,636**	,613**	,380**	,354**	,053	,176**	,423**	,289**	,282**	,317**	,470**	,436**	,012	,050	,290**	,287**	-,014	,920**
U_sobjective_norm1	,403**	,408**	,627**	,450**	,086	,165**	,344**	,286**	,275**	,271**	,328**	,344**	,049	,063	,219**	,242**	-,092	,452**
U_sobjective_norm2	,406**	,427**	,493**	,616**	,136**	,179**	,323**	,270**	,311**	,311**	,348**	,366**	,102*	,113*	,210**	,209**	-,012	,452**
U_PBC1	,237**	,272**	,211**	,258**	,538**	,394**	,268**	,220**	,245**	,268**	,261**	,302**	,257**	,113*	,227**	,263**	,074	,286**
U_PBC2	,349**	,379**	,324**	,370**	,350**	,309**	,295**	,209**	,280**	,300**	,299**	,339**	,180**	,131**	,275**	,298**	,059	,305**
U_desire1	,413**	,467**	,320**	,322**	,134**	,192**	,402**	,361**	,313**	,341**	,488**	,482**	,134**	,137**	,273**	,291**	,038	,598**
U_desire2	,406**	,448**	,255**	,273**	,193**	,183**	,421**	,380**	,355**	,376**	,401**	,436**	,230**	,189**	,250**	,278**	,113*	,527**
U_i_intentions1	,411**	,475**	,327**	,400**	,229**	,323**	,355**	,271**	,327**	,373**	,441**	,429**	,139**	,109*	,285**	,298**	,076	,453**
U_i_intentions2	,426**	,478**	,244**	,332**	,213**	,226**	,335**	,236**	,296**	,317**	,440**	,468**	,106*	,097	,279**	,307**	,053	,477**
U_we_intentions1	,418**	,457**	,278**	,326**	,164**	,215**	,351**	,222**	,297**	,316**	,499**	,515**	,102*	,104*	,346**	,328**	,000	,501**
U_we_intentions2	,434**	,464**	,310**	,341**	,126*	,205**	,339**	,246**	,260**	,299**	,504**	,494**	,080	,055	,314**	,317**	-,026	,542**
U_past_behavior1	,291**	,353**	,221**	,279**	,112*	,145**	,249**	,231**	,189**	,194**	,295**	,276**	,174**	,057	,247**	,330**	,053	,304**
U_past_behavior2	,323**	,377**	,230**	,301**	,097*	,161**	,317**	,264**	,259**	,303**	,346**	,331**	,074	,165**	,208**	,242**	,085	,390**
U_group_norms1	,417**	,447**	,311**	,311**	,080	,139**	,393**	,319**	,258**	,309**	,447**	,445**	,077	,058	,349**	,465**	-,014	,543**
U_group_norms2	,237**	,276**	,189**	,223**	,064	,105*	,219**	,185**	,138**	,158**	,345**	,345**	,010	-,031	,468**	,426**	-,041	,368**
Use of contents 1	-,040	-,071	-,067	-,031	-,227**	-,151**	-,368**	-,387**	-,503**	-,436**	-,101*	-,136**	-,563**	-,560**	,013	,025	-,434**	,095
Use of contents 2	,039	,036	-,018	,015	-,158**	-,096	-,260**	-,303**	-,409**	-,340**	-,040	-,066	-,491**	-,506**	,065	,047	-,372**	,158**
negative emotions1	,171**	,205**	,180**	,119*	,075	,073	,315**	,268**	,224**	,235**	,223**	,276**	,070	,122*	,126*	,100*	-,037	,243**
nehative emotions2	,107*	,097	,125*	,066	,064	,054	,242**	,208**	,175**	,164**	,167**	,182**	,030	,100*	,060	,029	,019	,199**
positive emotions1	,462**	,445**	,383**	,292**	,097*	,143**	,496**	,435**	,307**	,378**	,424**	,433**	,114*	,142**	,257**	,246**	,039	,478**
positive emotions2	,468**	,493**	,357**	,293**	,100*	,161**	,491**	,428**	,324**	,390**	,452**	,455**	,129**	,148**	,314**	,317**	,037	,497**
social identity1	,521**	,504**	,374**	,339**	,122*	,220**	,512**	,438**	,360**	,415**	,439**	,452**	,187**	,180**	,226**	,251**	,082	,483**
social identity2	,516**	,495**	,372**	,322**	,214**	,263**	,541**	,473**	,407**	,444**	,431**	,456**	,281**	,288**	,202**	,171**	,102*	,442**
greed 1	-,096	-,156**	-,092	-,085	-,069	-,075	-,117*	-,179**	-,170**	-,158**	-,131**	-,109*	-,238**	-,147**	-,110*	-,094	-,142**	,046
greed 2	-,088	-,151**	-,054	-,074	-,057	-,055	-,080	-,102*	-,152**	-,166**	-,129**	-,111*	-,167**	-,088	-,120*	-,161**	-,105*	,024
Participation 1	,478**	,492**	,344**	,329**	,283**	,317**	,579**	,519**	,547**	,551**	,479**	,520**	,459**	,389**	,242**	,209**	,316**	,398**
Participation 2	,474**	,498**	,327**	,273**	,325**	,349**	,599**	,561**	,590**	,604**	,470**	,509**	,473**	,456**	,240**	,224**	,333**	,399**

Note : *$p < .05$;**$p < .01$;***$p < .001$

Table 8 - Correlation matrix of parceled items – part B

U_attitude2	1,000								
U_sobjective_norm1	,454**	1,000							
U_sobjective_norm2	,438**	,665**	1,000						
U_PBC1	,290**	,265**	,274**	1,000					
U_PBC2	,312**	,288**	,325**	,570**	1,000				
U_desire1	,600**	,378**	,381**	,391**	,345**	1,000			
U_desire2	,515**	,308**	,347**	,423**	,378**	,677**	1,000		
U_i_intentions1	,485**	,351**	,409**	,443**	,562**	,569**	,529**	1,000	
U_i_intentions2	,499**	,362**	,409**	,416**	,470**	,646**	,563**	,751**	1,000
U_we_intentions1	,518**	,383**	,402**	,398**	,387**	,632**	,541**	,565**	,645**
U_we_intentions2	,564**	,434**	,451**	,360**	,387**	,653**	,524**	,574**	,656**
U_past_behavior1	,303**	,301**	,294**	,414**	,379**	,527**	,505**	,548**	,523**
U_past_behavior2	,370**	,276**	,322**	,326**	,334**	,559**	,550**	,618**	,609**
U_group_norms1	,560**	,390**	,375**	,379**	,327**	,636**	,583**	,545**	,551**
U_group_norms2	,414**	,265**	,273**	,273**	,281**	,461**	,391**	,448**	,449**
Use of contents 1	,098*	,049	,030	-,003	,031	,055	-,016	,113*	,120*
Use of contents 2	,163**	,076	,098*	,054	,084	,143**	,061	,156**	,206**
negative emotions1	,257**	,191**	,148**	,146**	,085	,269**	,308**	,167**	,175**
nehative emotions2	,213**	,149**	,089	,120*	,031	,190**	,211**	,068	,094
positive emotions1	,470**	,362**	,290**	,261**	,250**	,444**	,438**	,306**	,344**
positive emotions2	,493**	,366**	,327**	,260**	,304**	,495**	,489**	,384**	,392**
social identity1	,501**	,401**	,346**	,208**	,265**	,452**	,492**	,392**	,402**
social identity2	,453**	,395**	,341**	,231**	,273**	,412**	,446**	,377**	,371**
greed 1	,029	-,006	-,067	-,084	-,181**	-,066	-,085	-,194**	-,111*
greed 2	,017	,025	-,065	-,063	-,164**	-,104*	-,105*	-,210**	-,101*
Participation 1	,417**	,285**	,326**	,234**	,295**	,383**	,405**	,415**	,437**
Participation 2	,435**	,301**	,296**	,255**	,286**	,420**	,424**	,407**	,439**

Note : *$p < .05$;**$p < .01$;***$p < .001$

Table 8 - Correlation matrix of parceled items – part C

U_we_intentions1	1,000																			
U_we_intentions2	,861**	1,000																		
U_past_behavior1	,460**	,475**	1,000																	
U_past_behavior2	,495**	,497**	,679**	1,000																
U_group_norms1	,529**	,553**	,565**	,527**	1,000															
U_group_norms2	,426**	,488**	,454**	,373**	,742**	1,000														
Use of contents 1	,101*	,121*	,060	,059	,080	,101*	1,000													
Use of contents 2	,183**	,196**	,154**	,117*	,131**	,145**	,825**	1,000												
negative emotions1	,190**	,213**	,147**	,209**	,270**	,174**	-,005	,038	1,000											
nehative emotions2	,139**	,135**	,072	,145**	,189**	,104*	,027	,081	,727**	1,000										
positive emotions1	,314**	,360**	,305**	,351**	,490**	,298**	-,004	,064	,451**	,396**	1,000									
positive emotions2	,363**	,395**	,370**	,400**	,538**	,336**	-,017	,054	,451**	,300**	,864**	1,000								
social identity1	,397**	,418**	,360**	,348**	,504**	,337**	-,091	-,014	,393**	,289**	,551**	,543**	1,000							
social identity2	,338**	,367**	,309**	,324**	,453**	,272**	-,138**	-,089	,365**	,286**	,571**	,554**	,786**	1,000						
greed 1	-,079	-,086	-,183**	-,133**	-,014	-,016	,243**	,236**	,106*	,181**	,048	-,007	-,022	,001	1,000					
greed 2	-,109*	-,122*	-,211**	-,163**	-,057	-,011	,205**	,191**	,103*	,177**	,064	-,028	-,024	,030	,794**	1,000				
Participation 1	,344**	,371**	,328**	,375**	,406**	,325**	-,278**	-,149**	,234**	,180**	,443**	,461**	,501**	,525**	-,126*	-,129**	1,000			
Participation 2	,358**	,377**	,305**	,389**	,384**	,320**	-,343**	-,241**	,241**	,151**	,402**	,435**	,484**	,538**	-,132**	-,135**	,852**	1,000	,	

Note : *p < .05;**p < .01;***p < .001

Table 9 - Loadings for confirmatory factor analysis: Distinction between desirse and intentions

Factor	Number of items for aggregate	Loading
Contribution desire	2 items	.93
	1 item	.83
Contribution I-intentions	1 item	.88
	1 item	.95
Contribution we-intentions	1 item	.91
	1 item	.94
Individual use of contents by reading desire	2 items	.87
	1 item	.76
Individual use of contents by reading I-intentions	1 item	.83
	1 item	.90
Individual use of contents by reading we-intentions	1 item	.92
	1 item	.93
Participation we-intentions	1 item	.94
	1 item	.93

Table 10 - Correlations between latent variables – distinction between desires and intentions

	Participation we-intentions	Contributio desire	Contribution we-intentions	Contribution I-intentions	Use of contents by reading desire	Use of contents by reading we-intentions	Use of contents by reading I-intentions
Participation we-intentions	1.00						
Contributio desire	0.50***	1.00					
Contribution we-intentions	0.55***	0.69***	1.00				
Contribution I-intentions	0.50***	0.83***	0.60***	1.00			
Use of contents by reading desire	0.54***	0.52***	0.59***	0.44***	1.00		
Use of contents by reading we-intentions	0.53***	0.37***	0.58***	0.34**	0.77***	1.00	
Use of contents by reading I-intentions	0.56***	0.40***	0.54***	0.40***	0.80***	0.75***	1.00

Note: N = 428; *p < .05;**p < .01;***p < .001

However, the distinction between intentions and desire was decisive for our models, thus we used a more restrictive criterion for the distinction between constructs, testing the significance of the χ^2 indexes difference between nested models (Bollen, 1989; Kline, 1998). In one general model (baseline) we freely estimated the correlations for all the constructs; in a secondo model the correlation between two constructs was constrained to be equal to 1. The two models were then compared. The significance of the difference in the values of chi-square was then checked: if the latter would be significant, the two models differ from each other. Consequently the constructs under analysis were to be considered as distinct. We considered only those constructs whose difference was critical for our models. We listed the result of each difference test in Table 11 and all pairs of constructs that were compared are distinct we could claim that the two constructs in question differed.

Table 11 – Discrimination analysis

Modello Base $\chi^2[56]=93.05$ p=0.0014 RMSEA= 0.041 CFI=0.99 SRMR=0.023			
	$\chi^2[57]$	$\Delta\chi^2[1]$	p-value
C_desire = U_desire =1	268.47	175.42	$p < .001$
C_we_intentions = U_we_intentions = 1	498.50	405.45	$p < .001$
C_we_intentions = P_we_intentions = 1	563.72	470.67	$p < .001$
P_we_intentions = U_we_intentions = 1	528.78	435.73	$p < .001$
C_I_intentions = U_I_intentions = 1	375.93	282.88	$p < .001$
C_we_intentions = C_I_intentions = 1	484.25	391.20	$p < .001$
U_we_intentions = U_I_intentions = 1	239.70	146.65	$p < .001$
C_I_intentions = C_desire = 1	195.03	101.98	$p < .001$
U_I_intentions = U_desire = 1	158.90	65.85	$p < .001$
C_we_intentions = C_desire = 1	254.73	161.68	$p < .001$
U_we_intentions = U_desire = 1	186.50	93.45	$p < .001$

Note: C=Contribution P=participation U=Individual use of contents by reading

4.4.8 CFA for contribution behavioral model

We used confirmatory factor analysis to investigate convergent and discriminant validity. For the active contribution MGB we considered thirty-four observed variables for a total of eleven latent variables. The CFA obtained a good fit: χ^2 (135) = 258.73, $p \approx 0.00$; all the other goodness of fit were satisfactory: RMSEA = .048; SRMR = .028; CFI = .99; factor loadings were all high and consistent. Convergent validity was achieved because measures load only on the respective factor. Table 12 reports each latent variable with the respective factor loadings, while Table 13 reports the correlation between latent variables.

Table 12 - Loadings for confirmatory factor analysis - contribution behavioral model

Factor	Items for aggregate	Loading
Attitudes	3 items	.93
	3 items	.97
Group norms	1 item	.85
	1 item	.72
Subjective norms	1 item	.85
	1 item	.81
Past behavior	1 item	1.00
	1 item	.86
Perceived behavioral control	1 item	.83
	1 item	.77
Desire	2 items	.93
	1 item	.82
I Intentions	1 item	.92
	1 item	.92
We intentions	1 item	.90
	1 item	.95
Social identity	3 items	.87
	4 items	.90
Greed	3 items	.88
	2 items	.90
Contribution behavior *	1 item	1.00

Note: Completely standardized solution. Significance for all factors was $p < .001$; *observed variable

Table 13 - Correlations between latent variables – contribution behavioral model

	Attitude	Group norms	Subjective norms	Past behavior	PBC	Desire	I-int	We-int	Greed	Social identity	Contribution
Attitude	1										
Group norms	.34***	1									
Subjective norms	.53***	.33***	1								
Past behavior	.28***	.14*	.29***	1							
PBC	.23***	.17**	.33***	.57***	1						
Desire	.63***	.28***	.54***	.65***	.40***	1					
I-intentions	.50***	.21***	.53***	.75***	.55***	.83***	1				
We-intentions	.54***	.45***	.47***	.36***	.31***	.69***	.60***	1			
Greed	-.15**	-.18**	-.10	-.20***	-.08	-.13**	-.20***	-.14**	1		
Social identity	.59***	.29***	.48***	.33***	.27***	.63***	.50***	.54***	.01	1	
Contributions	.12*	.04	.06	.66***	.28***	.38***	.43***	.19***	-.13*	.10	1

Note: N = 428; *$p < .05$;**$p < .01$;***$p < .001$

4.4.9 CFA for the use of contents by reading

Confirmatory factor analysis was used in order to investigate convergent and discriminant validity. In this second model for the instrumental behavior of reading contents we considered thirty-eight observed variables and eleven latent variables. The CFA obtained a good fit: $\chi 2\ (155) = 272.30$, $p \approx 0.00$; Even if the χ^2 test was significant, all the other goodness of fit were satisfactory: RMSEA = .042; SRMR = .029; CFI = .99; factor loadings were all high and consistent. Convergent validity was achieved because measures load only on the respective factor. Table 14 reports each latent variable with the respective factor loadings and Table 15 reports the correlation between latent variables.

Table 14 - Loadings for confirmatory factor analysis - use of contents by reading model

Factor	Number of items for aggregate	Loading
Attitudes	3 items	.95
	3 items	.97
Subjective norms	1 item	.82
	1 item	.81
Group norms	1 item	.73
	2 items	1.00
Past behavior	1 item	.81
	1 item	.83
Perceived behavioral control	1 item	.70
	1 item	.80
Desire	2 items	.86
	1 item	.78
I-intentions	1 item	.86
	1 item	.86
We-intentions	1 item	.91
	1 item	.94
Social identity	3 items	.90
	4 items	.87
Greed	3 items	.92
	2 items	.86
Individual use of contents by reading	2 items	.88
	2 items	.94

Note: Completely standardized solution; Significance for all factors was $p < .001$.

*observed variable

Table 15 - Correlations between latent variables - use of contents by reading behavioral model

	Attitude	Subjective norms	Group Norms	Past behavior	PBC	Desire	I-int	We-intentions	Social identity	Greed	Use of contents by reading
Attitude	1										
Subjective norms	.56***	1									
Group norms	.56***	.46***	1								
Past behavior	.43***	.44***	.65***	1							
PBC	.39***	.46***	.43***	.57***	1						
Desire	.71***	.52***	.73***	.78***	.58***	1					
I-intentions	.57***	.54***	.62***	.80***	.73***	.80***	1				
We-intentions	.59***	.55***	.56***	.61***	.52***	.77***	.74***	1			
Greed	.03	-.04	-.03	-.23***	-.20***	-.12*	-.20***	-.12*	1		
Social identity	.56***	.51***	.54***	.45***	.36***	.60***	.50***	.46***	.00	1	
Use of contents by reading	.15**	.09	.11*	.13*	.07	.10	.19***	.18***	-.10	.27***	1

Note: N = 428; *$p < .05$;**$p < .01$;***$p < .001$

4.4.10 CFA for participation behavioral model

We used confirmatory factor analysis to investigate convergent and discriminant validity. In this model we considered forty-six observed variables and fifteen latent variables. The CFA obtained a good fit: χ^2 (234) = 372.61, $p \approx 0.00$; all the other goodness of fit were satisfactory: RMSEA = .039; SRMR = .028; CFI = .99; factor loadings were all high and consistent. Convergent validity was achieved because measures load only on the respective factor. Table 16 reports each latent variable with the respective factor, while Table 17 reports the correlation between latent variables.

Table 16 - Loadings for confirmatory factor analysis – participation behavioral model

Factor	Number of items for aggregate	Loading
Contribution desire	2 items	.92
	1 item	.83
Use of contents by reading desire	2 items	.87
	1 item	.78
Contribution I-intentions	1 item	.91
	1 item	.93
Contribution we-intentions	1 item	.91
	1 item	.94
Contribution behavior	1 item	1.00*
Individual use of contents by reading I-intentions	1 item	.84
	1 item	.89
Individual use of contents by reading we-intentions	1 item	.92
	1 item	.93
Individual use of contents by reading behavior	2 items	.95
	2 items	.87
Participation we-intentions	1 item	.92
	1 item	.96
Participation behavior	3 items	.90
	2 items	.94
Positive anticipated emotions toward participation	2 items	.93
	2 items	.93
Negative anticipated emotions toward participation	2 items	.96
	2 items	76
Social identity	3 items	.87
	4 items	.90
Greed	3 items	.89
	2 items	.89

Note: Completely standardized solution. Significance for all factor was $p < .001$.

*observed variable

Table 17 - Correlations between latent variables - participation behavioral model

	C_DES	U_DES	C_IINT	C_WEINT	CONTR	U_IINT	U_WEINT	UOCBR	P_WEINT	PART	NEMO	PEMO	ID	GREED
C_des	1.00													
U_des	0.53***	1.00												
C_Iint	0.84***	0.44***	1.00											
C_Weint	0.69***	0.59***	0.60***	1.00										
Contr	0.38***	0.09	0.42***	0.19***	1.00									
U_Iint	0.40***	0.80***	0.40***	0.55***	0.08	1.00								
U_Weint	0.37***	0.77***	0.34***	0.58***	0.00	0.75***	1.00							
Uocbr	-0.43***	0.05	-0.53***	-0.13**	-0.46***	0.15***	0.13**	1.00						
P_Weint	0.50***	0.54***	0.49***	0.55***	0.13**	0.56***	0.52***	-0.04	1.00					
Part	0.70***	0.52***	0.68***	0.58***	0.36***	0.52***	0.41***	-0.36***	0.62***	1.00				
Nemo	0.35***	0.35***	0.26***	0.28***	-0.01	0.20***	0.23***	0.01	0.35***	0.27***	1.00			
Pemo	0.35***	0.60***	0.41***	0.51***	0.05	0.44***	0.41***	0.00	0.50***	0.50***	0.50***	1.00		
Id	0.64***	0.59***	0.50***	0.54***	0.10***	0.49***	0.45***	-0.14**	0.50***	0.62***	0.45***	0.68***	1.00	
Greed	-0.14***	-0.12**	-0.20***	-0.15***	-0.13***	-0.19***	-0.12**	0.37***	-0.19***	-0.15***	0.13**	0.02	0.00	1.00

Note: C_des=contribution desire, U_des=use of contents by reading desire, C_Iint=contribution I-intentions, C_Weint=contribution we-intentions, Contr= contribution behavior, correlation between latent variables. U_Iint= use of contents by reading I-intentions, U_Weint= use of contents by reading we-intentions, Uocbr= use of contents by reading behavior, P_Weint= participation we-intentions, Part= participation behavior; Nemo= negative anticipated emotions, Pemo=positive anticipated emotions; Id=social identity;
N = 428 ; *p < .05;**p < .01;***p < .001

4.5 Structural models

We first tested a reduced version of the MGB model considering the instrumental behaviors: the contribution behavior and the use of contents by reading in a virtual community (Figure 18). In both cases we analyzed the antecedents for contribution and for the use of contents by reading goals. It is worthwhile noting that we did not consider the effects of positive and negative emotions toward contribution and use of community contents. In a second stage, we narrowed the focus on the participation process in a virtual community.

4.5.1 Testing the MGB for contribution behavior

In this section the structural model findings for the model of goal directed behavior for contribution are presented (see Figure 19 and 20); the fit statistics for the MGB model for contribution were satisfactory: $\chi^2[118] = 231.16$, $p \approx .00$, RMSEA = .048, SRMR = .030, and CFI = .99.

We found significant effects for attitude ($\gamma = .27$, $p < .001$) and for subjective norms ($\gamma = .18$, $p < .001$) on desire. Group norms predicted only we-intentions to act ($\gamma = .26$, $p < .001$) but not desire. In this model, social identity emerged as significant predictor only for desires ($\gamma = .26$, $p < .001$) but not for we-intentions. PBC showed positive significant effects only on I-intentions to contribute ($\gamma = .17$, $p < .001$). Past behavior showed strong and significant effects on desire ($\gamma = .49$, $p < .001$), I-intentions ($\gamma = .23$, $p < .001$), we-intentions to act ($\gamma = -.18$, $p<.01$) and contribution behavior ($\gamma = .82$, $p < .001$). Desire predicted we-intentions ($\beta = .67$, $p < .001$) and I-intentions ($\beta = .65$, $p < .001$), but neither I-intentions nor we-intentions predicted behavior.

The model accounted for the 74% of variance in desires, for the 59% of variance in we-intentions and for the 81% of variance in I-intentions. In the basic model, we-intentions and I-intentions did not mediate the effects of the considered variables on behavior and the model with the effects of past behavior accounted for the 46% of variance in contribution behavior (see Figure 20).

4.5.2 Tests of mediation and rival hypotheses for contribution behavior model

We performed formal tests of mediation with nested models for all possible paths to endorse whether additional direct paths on intentions and desire, not specified in the hypothesized model, were significant (see Bagozzi, 2011; Bagozzi & Dholakia, 2006a for a similar methodology). As we show in Table 18, of the six tests of rival hypotheses for the direct effects, two indicates that we cannot reject the rival hypotheses. The goodness-of-fit statistics for a model that includes the additional path from subjective norms to I-intentions ($\gamma = .17$, $p < 0.05$): $\chi^2(116) =$

223.75, $p \approx .00$, RMSEA = .047, SRMR = .029 and CFI = .99. This direct path did not contribute in variance for I-intentions ($R^2 = .80$) and contribution behavior ($R^2 = .46$).

The significant effect from subjective norm to I-intentions implies that desire partially mediated the effects of subjective norm, and that I-intentions were directly influenced by it (see Figure 22).

Table 18 – MGB for contribution mediation tests

	Model	Goodness-of-Fit	Tests of Hypotheses
M_1	baseline model	χ^2 (118) = 231.16, $p \cong .00$, RMSEA = .048 CFI = .99, SRMR = .030	
M_2	desire → behavior	C^2 (116) = 230.38, p=0.0	M_1–M_2: χ^2_d (1) =0.78 , p = 0.37
M_3	attitude → I-intentions	χ^2 (116) = 231.14, p=0.0	M_1–M_3: χ^2_d (1) =0.02 , p=0.887
M_4	attitude → we-intentions	χ^2 (116) =230.62, p=0.0	M_1–M_4: χ^2_d (1) = 0.54 , p = 0.462
M_5	attitude → use of contents behavior	χ^2 (116) =230.49, p=0.0	M_1–M_5: χ^2_d (1) = 0.67, p = 0.413
M_6	**Subjective norms → I-intentions**	**χ^2 (116) =223.75, p=0.0**	**M_1–M_6: χ^2_d (1)= 7.41 , p = 0.006**
M_7	Subjective norms → we-intentions	χ^2 (116) =231.16, p=0.0	M_1–M_7: χ^2_d (1) = 0.00 p = 0.998

We also tested an additional model considering the effects of greed. The goodness-of-fit statistics for a model that includes the effects of greed reach the following values: $\chi2(117) = 192.64$, $p \approx .00$, RMSEA = .041, SRMR = .030 and CFI = .99. Greed showed a significant and negative effect on the contribution I-intentions ($\gamma = -.11$, $p < .001$)

4.5.3 The effects of past contribution behavior

In the MGB for contribution behavior (Figure 19), past behavior showed very strong effects on the dependent variables; this indeed led us to think that past behavior guided the users contribution behavior. Thus, we tested a second model without considering the effects of past behavior (see Figure 20); the fit statistics were satisfactory: $\chi^2[94] = 157.62$, $p \approx .00$, RMSEA = .041, SRMR = .032, and CFI = .99. We found significant effects for attitude ($\gamma = .31$, $p < .001$) and for subjective norms ($\gamma = .18$, $p < .001$) on desire. Group norms predicted only we-intentions to act ($\gamma = .27$, $p < .001$) but not desire. In this model, social identity emerged as significant predictor for

desires ($\gamma = .26$, $p < .001$) and for we-intentions ($\gamma = .12$, $p < .01$) but not for I-intentions. PBC was a significant predictor for desire ($\gamma = .18$, $p < .001$) and for I-intentions to contribute ($\gamma = .26$, $p < .001$).

In the previous model the causal link between I-intentions and desire was captured by past behavior. The relevant aspect that emerged in this model is the significant path from intentions to the active contribution behavior. In this model the desire predicted we-intentions ($\beta = 0.54$, $p < .001$) and I-intentions ($\beta = 0.78$, $p < .001$). I-intentions predicted contribution behavior ($\beta = 0.46$, $p < .001$).

The model accounted for the 57% of variance in desires, for the 57% of variance in we-intentions and for the 76% of variance in I-intentions. In this model I-intentions, but not we-intentions, mediated the effects of the considered variables on behavior accounting for the 19% of variance in contribution behavior (see Figure 20).

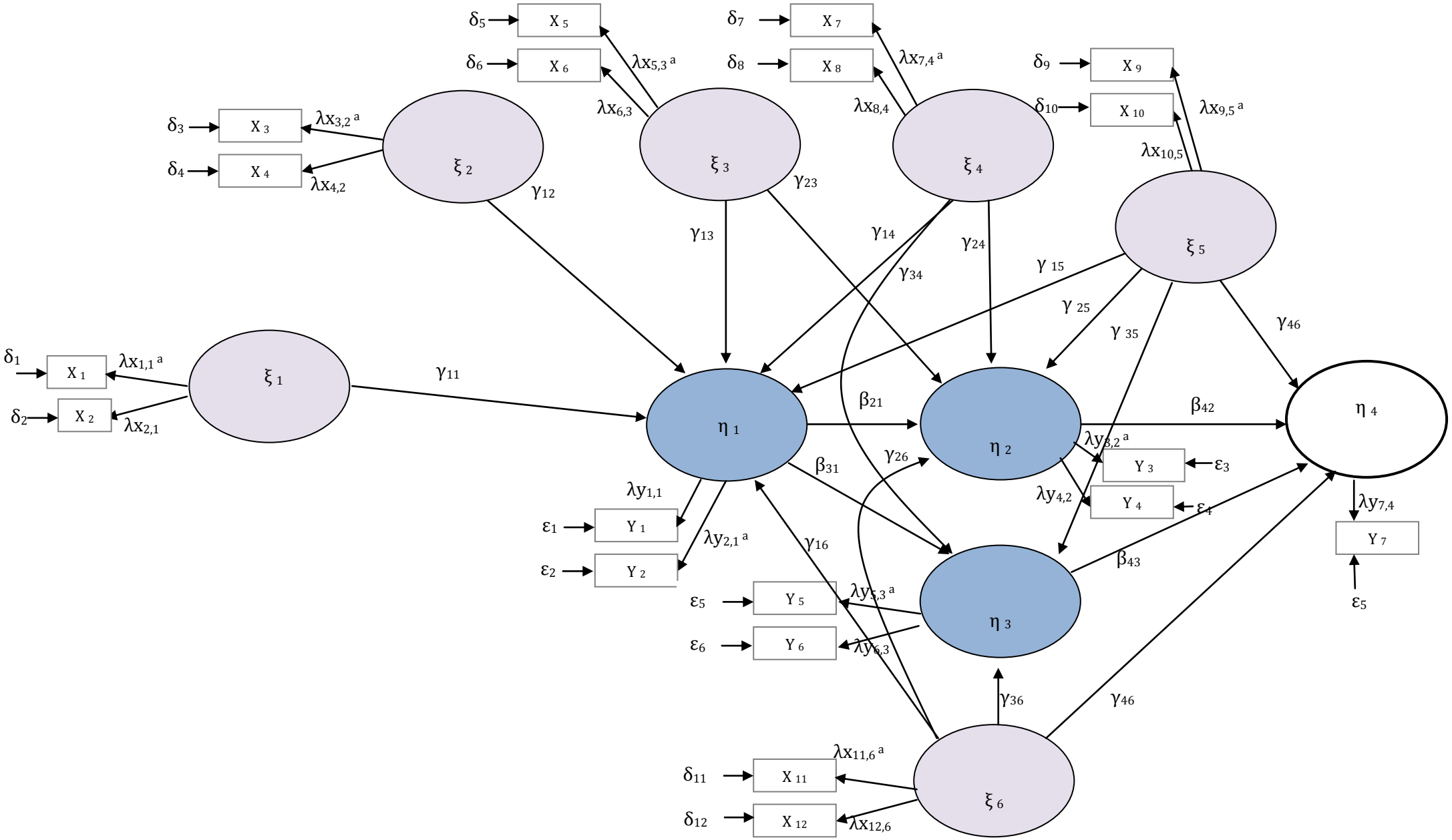

Figure 18 – MGB for active contribution / use of community contents behavior theoretical model. Note. a = fixed parameter.

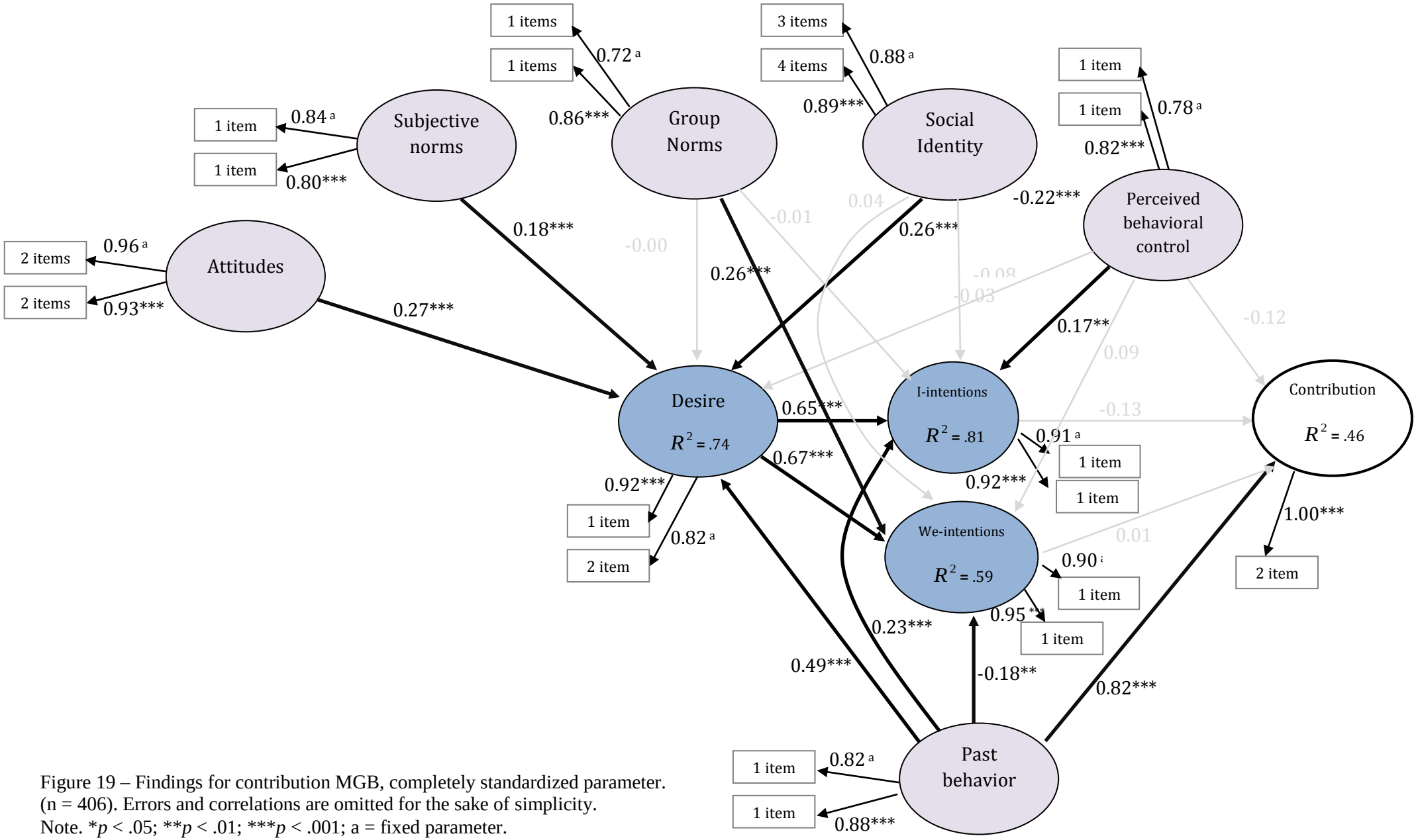

Figure 19 – Findings for contribution MGB, completely standardized parameter. (n = 406). Errors and correlations are omitted for the sake of simplicity.
Note. *p < .05; **p < .01; ***p < .001; a = fixed parameter.

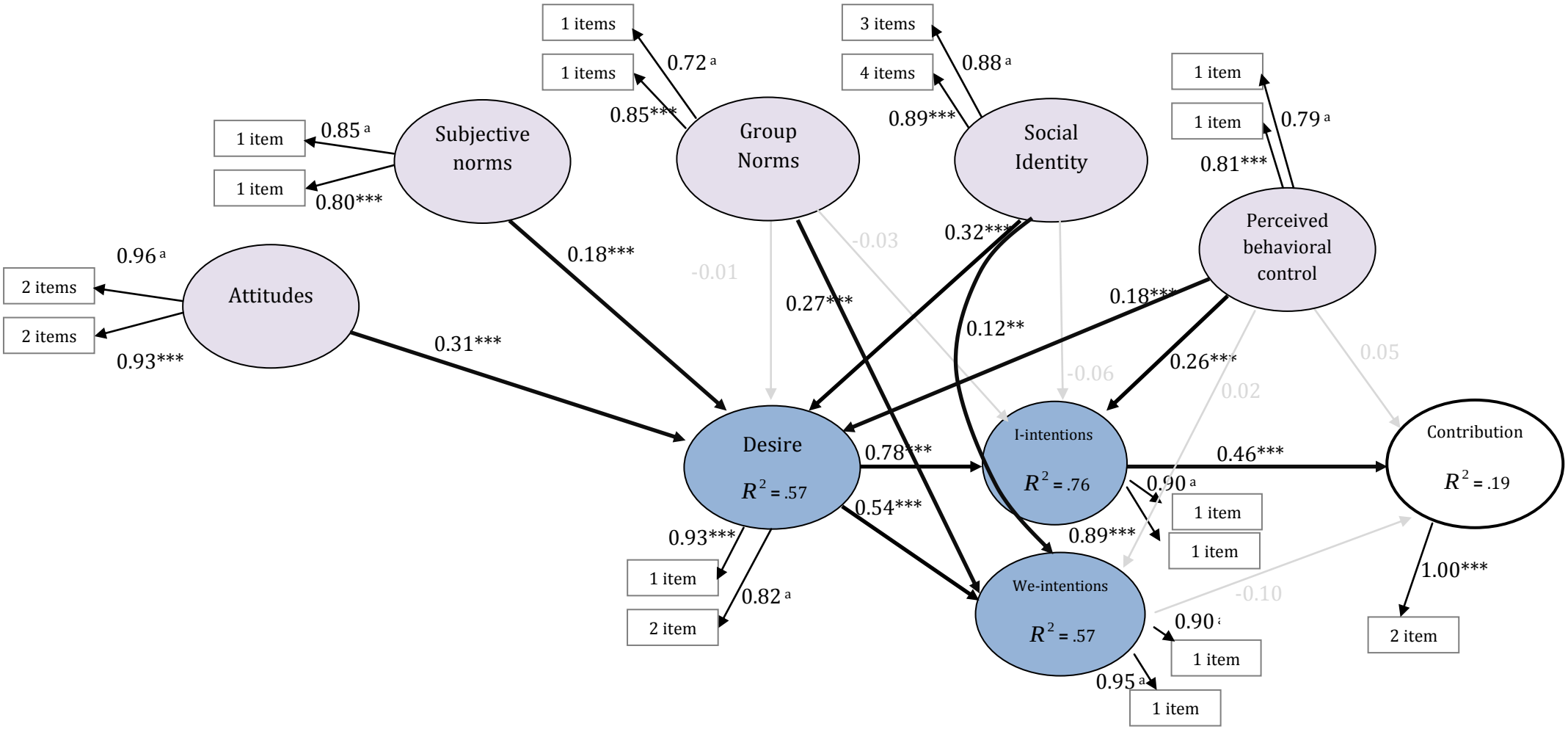

Figure 20 – Findings for contribution MGB with no past behavior effects, completely standardized parameter (N = 406). Errors and correlations are omitted for the sake of simplicity. Note. *p < .05; **p < .01; ***p < .001; a = fixed parameter.

4.5.4 Testing the MGB for the use of community contents by reading

In this section the structural model findings for the MGB for using community content by reading are presented (Figure 21); the fit statistics were satisfactory: $\chi 2[137] = 269.85$, $p \approx .00$, RMSEA = .050, SRMR = .040, and CFI = .99.

We found significant effects for attitude ($\gamma = .34$, $p < .001$) on desire. Group norms predicted only desire to act ($\gamma = .18$, $p < .001$) but not intentions. PBC had significant and positive effects on both I-intentions ($\gamma = .33$, $p < .001$) and we-intentions ($\gamma = .14$, $p < .01$) to use community contents by reading. Past behavior showed a significant effect on desire ($\gamma = .43$, $p < .001$) and I-intentions ($\gamma = .24$, $p < .001$). Desire predicted I-intentions ($\beta = 0.88$, $p < .001$) and we-intentions ($\beta = 0.53$, $p < .001$), but neither I-intentions nor we-intentions mediate the effects of the considered variables on behavior. Social identity did not emerge as significant predictor for desire and we-intentions. The model accounted for the 85% of variance in desires, for the 67% of variance in we-intentions and for the 83% of variance in I-intentions. The effects of the considered variables accounted only for the 5% of variance in using community content by reading behavior (see Figure 21).

4.5.5 Tests of mediation and rival hypotheses

Adopting the methodology used in the previous studies (see Bagozzi, 2011; Bagozzi & Dholakia, 2006a) we performed formal tests of mediation with nested models to endorse whether additional direct paths toward desire and intentions, not specified in the hypothesized model, were significant. Of the six tests of rival hypotheses for the direct effects (Table 19), only two indicates that we cannot reject the rival hypotheses. The goodness-of-fit statistics for a model that includes the path from subjective norm to we-intentions ($\gamma = .18$, $p < .001$) reach the following values: $\chi^2(135) = 260.95$, $p \approx .00$, RMSEA = .048, SRMR = .034 and CFI = .99. The direct path from subjective norm to we-intentions means that we-intentions mediate the effect of the subjective norm

on the dependent variables. Note that this effect did not contribute in variance for we-intentions (R^2 =.66).

Table 19 – Augmented MGB mediation tests

Model	Added Path	Goodness-of-Fit	Tests of Hypotheses
M_1	baseline model	χ^2 (137) = 269.85, $p \cong$ .00, RMSEA = .050 CFI = .99, SRMR = .040	
M_2	desire → behavior	C^2 (136) = 268.16, p=0.0	M_1–M_2: χ^2_d (1) = 1.69 , p = 0.162
M_3	attitude → I-intentions	χ^2 (136) = 269.59, p=0.0	M_1–M_3: χ^2_d (1) = 0.26, p=0.610
M_4	attitude → we-intentions	χ^2 (136) = 269.84, p=0.0	M_1–M_4: χ^2_d (1) = 0.01 , p = 0.920
M_5	attitude → use of contents behavior	χ^2 (136) = 269.45, p=0.0	M_1–M_5: χ^2_d (1) = 040, p = 0.520
M_6	Subjective norms → I-intentions	χ^2 (136) = 269.46, p=0.0	M_1–M_6: χ^2_d (1) = 041 , p = 0.521
M_7	**Subjective norms → we-intentions**	**χ^2 (136) = 260.95, p=0.0**	**M_1–M_7: χ^2_d (1) = 9.10 p = 0.002**

We also tested a model with the effects of greed. The goodness-of-fit statistics for a model that includes the effects of greed reach the following values: $\chi^2(167) = 302.32$, $p \approx .00$, RMSEA = .044, SRMR = .032 and CFI = .99. Greed showed a significant and positive effect on the behavior ($\gamma = .32$, $p < .001$)

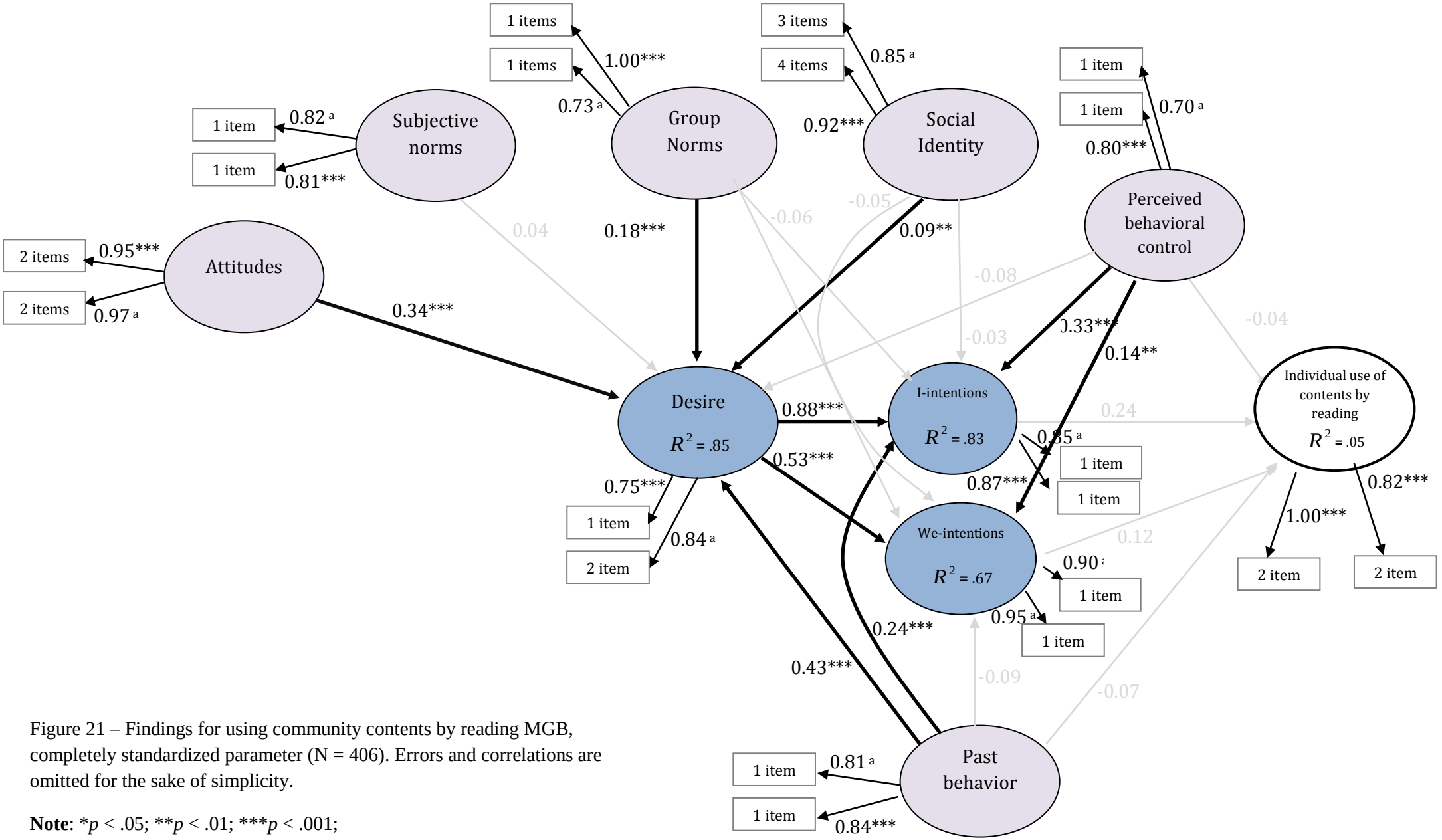

Figure 21 – Findings for using community contents by reading MGB, completely standardized parameter (N = 406). Errors and correlations are omitted for the sake of simplicity.

Note: *p < .05; **p < .01; ***p < .001;

a = fixed parameter.

4.5.6 Testing the model for participation behavior

The structural model findings for participation behavioral goal are presented in this section (see Figure 22 and Figure 23); the fit statistics of the tested model for contribution were satisfactory: $\chi^2[244] = 760.01$, $p \approx .00$, RMSEA = .073, SRMR = .076, and CFI = .98.

Focusing on the contribution behavioral goal part of the model, we found significant effects for desire to contribute on the respective I-intentions ($\gamma = .86$, $p < .001$) and we-intentions ($\gamma = .57$, $p < .001$). We-intentions to contribute ($\beta = .26$, $p < .001$) did not predict active contribution but predicted we-intentions to participate in the community.

Shifting the focus on the antecedents of the use of community resources by reading, we found significant effects for desire to use contents by reading on the respective I-intentions ($\gamma = .89$, $p < .001$) and we-intentions ($\gamma = .88$, $p < .001$). Furthermore, we-intentions to use community contents by reading ($\beta = .28$, $p < .001$) predicted we-intentions to participate in the community but not the individual use of community content by reading.

Social identity positively influenced we-intentions to contribute ($\beta = .20$, $p < .001$), we-intentions to participate ($\beta = .26$, $p < .001$) and participation behavior ($\beta = .39$, $p < .001$), whereas it negatively influenced the use of contents by reading behavior ($\beta = -.33$, $p < .001$)

Finally, contribution behavior was influenced by I-intentions to contribute ($\beta = .43$, $p < .001$) while the use of community contents by reading was predicted by I-intentions to use community contents ($\beta = .20$, $p < .001$). Participation behavior was predicted by we-intentions to participate ($\beta = .38$, $p < .001$), by contribution behavior ($\beta = .09$, $p < .01$), and negatively by the use of community contents by reading ($\beta = -.24$, $p < .001$).

Regarding the emotional influences toward participation, neither positive anticipated emotions nor negative anticipated emotions influenced the participation behavior.

This model accounted the 13% of variance in contribution behavior, 9% of variance in using community contents instrumental behavior and 62% of variance in participation behavior (see Figure 23).

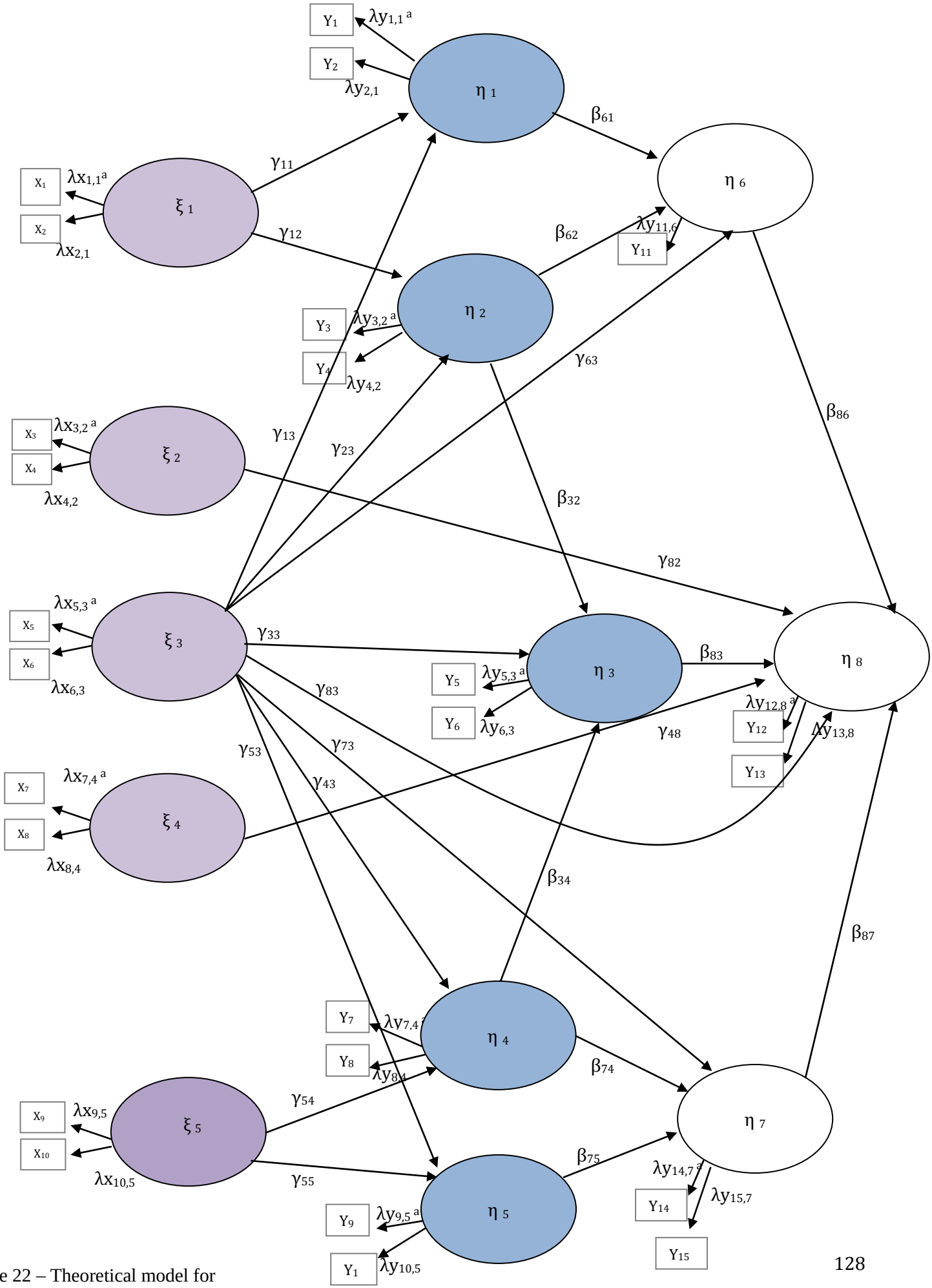

Figure 22 – Theoretical model for participation behavioral goal.
Note: a = fixed parameter.

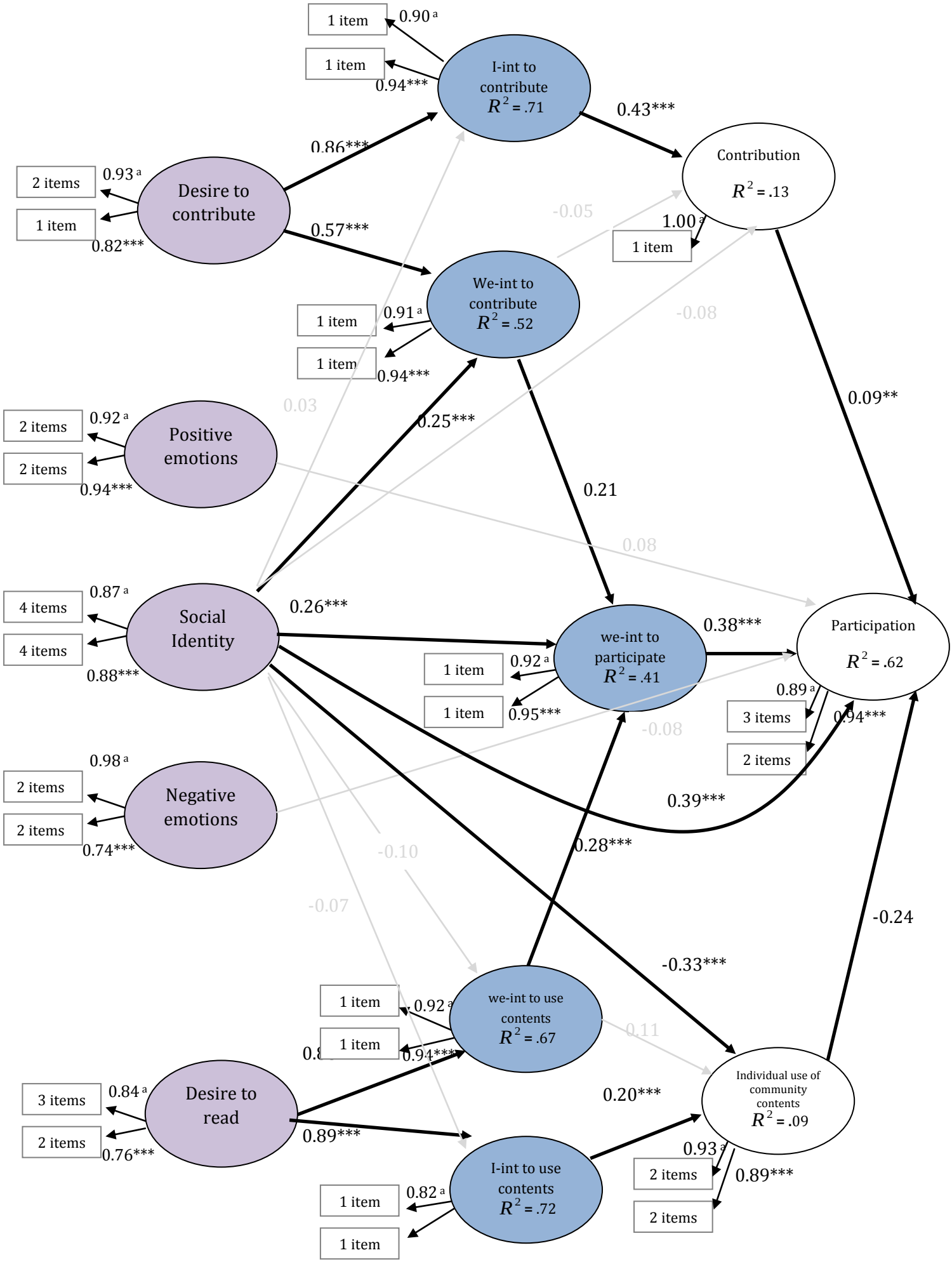

Figure 23 – Findings for participation behavior, completely standardized parameter (N = 406). Errors and correlations are omitted for the sake of simplicity. **Note:** *p < .05; ** p < .01; ***p < .001; a = fixed parameter.

4.5.7 Testing the effects of greed on participation

We hypothesized that greed could represent a form of contribution inhibition. In Study 1 we found that greed affected negatively the process of contents contribution. In this second study we added greed construct in the model for participation (Figure 24). We hypothesized that greed might negatively influence contribution but positively influence the use of contents behavior (Figure 28). The model fit the data well: χ^2 (279) = 736.77, $p \cong .00$, RMSEA = .063; CFI = .98, SRMR = .074.

The results of the basic model for participation were replicated; significant effects for desire to contribute on the respective I-intentions (γ = .82, p < .001) and we-intentions to contribute (γ = .53, p < .001) were found. We-intentions to contribute (β = .23, p < .001) predicted we-intentions to participate in the community. Regarding the antecedents of using community resources by reading behavior, we found that desire to use contents by reading determined the respective I-intentions (γ = .87, p < .001) and we-intentions (γ = .87, p < .001). This latter variable (β = .26, p < .001) predicted we-intentions to participate in the community.

Also the findings relative to social identity were replicated. It positively influenced we-intentions to contribute (β = .23, p < .001), we-intentions to participate (β = .29, p < .001) and participation behavior (β = .41, p < .001). Furthermore, it negatively influenced the individual use of contents by reading behavior (β = -.40, p < .01).

Narrowing the focus on the three behavioral goals in our study, we found that contribution behavior was influenced by the respective I-intentions (β = .42, p < .001) as well as the use of community contents by reading (β = .32, p < .001). Participation behavior was predicted by we-intentions to participate (β = .38, p < .001), by contribution behavior (β = .10, p < .01) and negatively predicted by the use of community contents by reading (β = -.23, p < .001).

Greed showed a negative and significant effect on I-intentions to contribute (γ = -.10, p < .01), on we-intentions to participate (γ = -.13, p < .001) and a direct but positive effect on the use of contents by reading behavior (γ = .37, p < .001).

We did not find significant effects neither for positive anticipated emotions nor negative anticipated emotions on participation behavior.

Considering the effect of greed, the presented model accounted for the 13% of variance in contribution behavior and for the 23% of variance in using community contents behavioral goal. The amount of variance for participation, instead, remained unchanged (62%, see Figure 24).

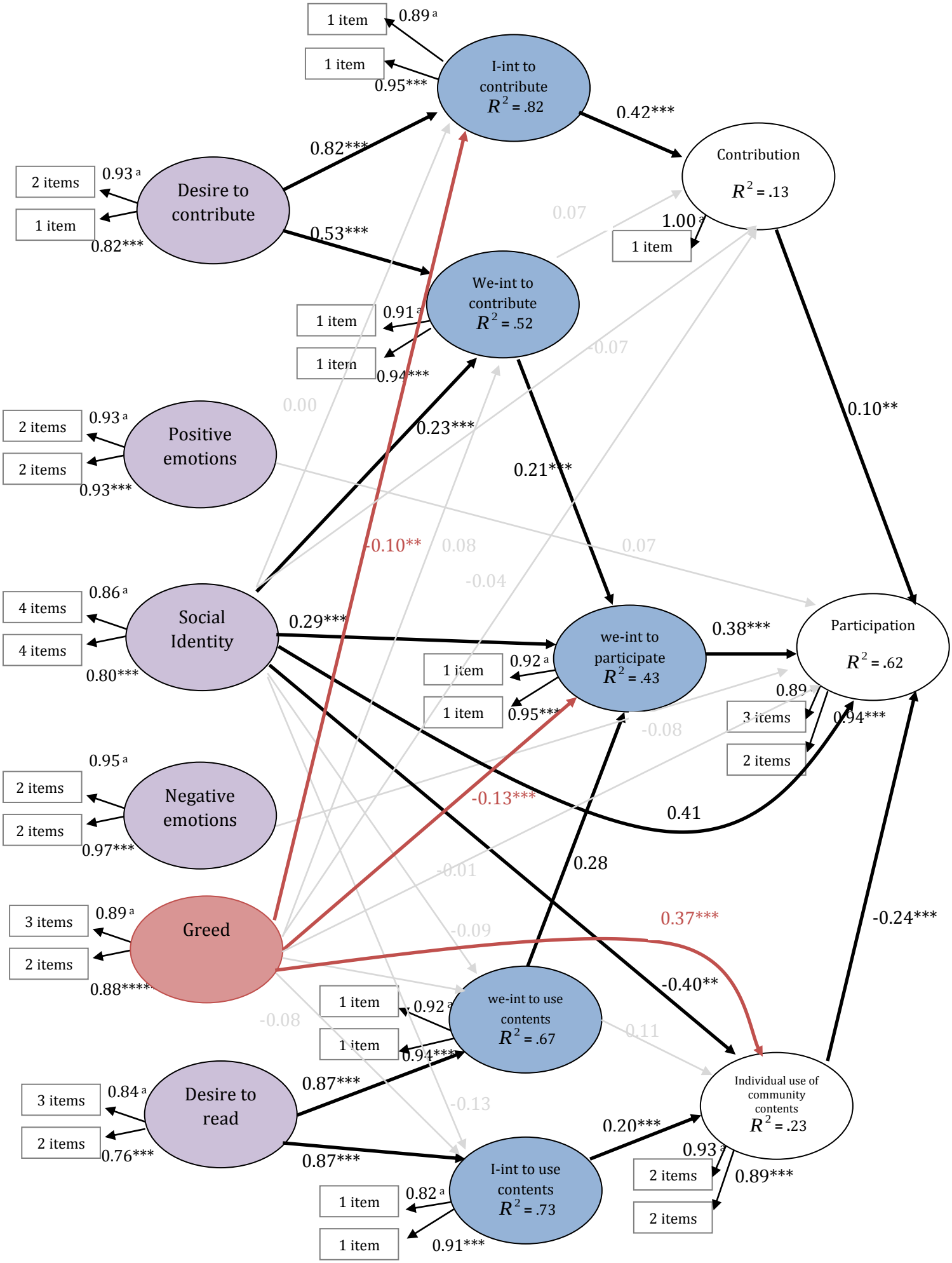

Figure 24 – Findings for participation behavior plus greed, completely standardized parameter (N = 406). Errors and correlations are omitted for the sake of simplicity. **Note**: *p < .05; **p < .01; ***p < .001; a = fixed parameter.

4.6 Discussion

The principal aim of this study was to investigate the behavioral goal of participation in a web community, defined as the combination of community content contribution and community content usage by users. Some authors argued that virtual communities coincide with the increasingly popular "consumer empowerment" movement, which encourages companies to treat their customers as active co-producers rather than as a passive audience (Vargo & Lusch, 2004). In this sense, participation defines the new Web 2.0 generation of users, often named *prosumers*; the term is formed from the composition of the word *producer* with the word *consumer*. Starting from this definition, we thought that the sense of participation in a virtual community was defined by two common activities on the web, the contents contribution (that defines the producer part of the word prosumer) and the use of community contents by reading (that defines the consumer part of the word prosumer).

Once we defined this distinction, our interest moved further, in order to understand the factors that may inhibit the participation in a web community. For this reason we considered two different assumptions. We hypothesized that the use of community resources by reading, as the only way to access the virtual community, may not lead to a real sense of participation. The general idea is that the mere use of content by reading does not lead to participation, identifying the typical behavior of free-riders.

The second hypothesis we wanted to test was related to the effects of greed. The desire to improve outcomes for oneself instead of maximizing the good for the group could lead to negative effects on the behavior of contribution and participation. In a complementary manner, greed might have positive effects on the use of community content.

Respondents were members of a discussion forum, namely PIPAM, and the three behavioral goals were represented by (1) the participation, assessed with six ad-hoc created items, (2) the use of content by reading behavior, assessed with five ad-hoc created items, and contribution, assessed

counting the number of comments and posts for every participants during the one-month period of our study.

We divided our study in three different parts. We first use the MGB rationale to investigate the antecedents of the contribution behavior, and then we investigated the antecedents for the use of community contents by reading behavior. Finally we tested the effects of these two behaviors on the general behavioral goal of participation.

In the first step of our study, according to previous research (e.g., Bagozzi, 2011; Bagozzi & Dholakia, 2002, 2006a, 2006b; Bagozzi, Dholakia, & Pearo, 2006) using the MGB theoretical framework plus we-intentions, we found that attitudes, subjective norm, group norm, perceived behavioral control and social identity positively influenced the desire to contribute. In our first model (see Figure 18 and 19), the basic MGB plus we-intentions and social influences variables accounted for the 46% of variance in the contribution behavior, but intentions did not predict the behavioral goal. In a second model (see Figure 20) that not included the effect of past behavior, antecedent variables accounted for the 19% of variance in the contribution behavior. Previous research suggested that measures of past behavioral frequency predict the occurrence of future behavior over and above a number of established antecedents of behavior such as attitudes and intentions (e.g., Ouellette & Wood, 1998). We speculate that the behavior of contribution in PIPAM was driven mainly by past behavior. In other words, a member of the community contributes if he/she has already done it in the past. It is important to note that PIPAM was founded as a discussion forum and very often discussions among users protracted for a long time, some topics are even discussed several times during specific period of the year. We think that for these reasons when a user joins a discussion with other members, he/she can be moved by the fact that he had previously participated in discussions with a similar topic during the past. Moreover, we found the community to be particularly active with a lot of interaction, so it is easy to assume that it is easier for a user to enter a new discussion, having found reciprocity from other members in previous discussions. By satisfactory repetition, a behavior might become automatic in the sense that a

specific response is spontaneously triggered by a specific cue: once behavior has been sufficiently repeated, it might be habit (Verplanken & Orbell, 2003).

When considering the second target behavior of this study, we found that attitudes, group norm, perceived behavioral control and social identity positively influenced the desire to use the community contents by reading. In our first model (see Figure 21), the basic MGB plus we-intentions and social influences variables accounted only for the 5% of variance in the use of contents behavior, and neither I-intentions nor we-intentions predicted the behavioral goal.

In the third step of our study, we investigated the effects of the two target behaviors on the goal of participation to the web community. Our hypotheses were confirmed, contribution behavior positively predicted participation, while the individual use of community resources by reading inhibited participation. In our model the anticipated positive and negative emotions towards participation showed no significant effects.

Similarly to what suggested by Bagozzi and Dholakia (2004, 2006a, 2006b) social identity showed positive and significant effects only on we-intentions to contribute, we-intentions to participate and on participation behavior. Moreover, social identity showed a significant and negative effect on the use of contents by reading behavior (figure 21). Apparently this can be interpreter as inconsistent. Note that we investigated the individual willingness to use community resources. We can easily interpret this effect thinking at the free-riders phenomenon. In psychology, a free-rider (or freeloader) is someone who consumes a resource without paying for it, or pays less than the full cost. Free riding is usually considered to be a problem only when it leads to the non-production or under-production of a public good or when it leads to the excessive use of a common property resource. Regarding the use of community contents, we hypothesize that the greater the identification with the group the lower the desire to just use community contents by reading. One of the reasons that lead people to take part in an action that is shared with other members is that people need to belong to a group, which increases their self esteem (Bagozzi & Dholakia, 2004). In other words, the more a user is identified with the web community, the more he feels part of it as a user

and therefore he/she will not limit to read the contents but he/she will express the desire to contribute and participate.

As well as in the MGB models for contribution and for the use of contents behaviors (see Figure 19, 20 and 21) even in the model concerning the participation emerged that contribution and the use of contents by reading goals were almost driven by individual intentions. Considering the model in Figure 23, the we-intentions to contribute and the we-intentions to use contents by reading leaded indeed to the we-intentions to participate. It is worthwhile noting that the I-intentions to use community contents was a proximal determinant of the related behavioral goal which in turn negatively affected the goal participation. This was not true for we-intentions to use community contents, which did not determine the related behavioral goal, but positively affected the we-intentions to participate in the community.

Bagozzi and Dholakia (2004) and Bagozzi and Lee (2002) showed the different antecedents of I-intentions and we-intentions in online communities, while Antin and Cheshire (2010) distinguished between different types of readers in a web community divided them into reader-free-riders and participant readers. We observed that the use of community contents by reading might be driven by different intentional forces. In this sense, reader-participants might express a stronger we-intention to read the contents of the community thinking about this action as something collective that lead to a sense of participation; On the other side the reader-free riders might express a stronger individual intention only to use and benefit from the resources offered by the community that did not lead to participation.

Considering the suggestion of Antin & Cheshire (2010) we can think of online participation as the composition of two distinct activities - active contribution and the use of community resources - aimed at the same goal of participation. Our interpretation is that participation goal is driven by the shared intentions between all members to participate in the community. This willingness is expressed through the we-intentions to contribute to the growth of the community, but also through a participatory reading activity to review the contents of the

community. A member will use community resources by reading, negatively influencing participation: he/she accesses the community resources only for personal interests or needs. This process was confirmed also when we included the construct of greed in the model (Figure 24). Greed is defined as the desire to maximize the outcomes for the individual instead of the outcomes for the group. We used a reduced version of the scale proposed by Markòczy (2007) to measure the construct of greed. Note that items perfectly shape the six conditions expressed by Tuomela (1992) in describing the phenomenon of free-riding. In our model greed showed significant and negative effects on the we-intentions to participate and on the I-intentions to contribute (the more the individual want to maximize the outcomes for himself/herself, the less he/she will focus on sharing his/her knowledge with others through contribution). Greed also showed a positive and significant effect on the contribution behavior confirming the relevance of our observations (the more a user want to maximize the outcomes for himself/herself, the more he/she will only spend time to use the contents offered by the community by reading).

In this study we investigated what are the paths that lead to online participation, and what might be the factors that inhibit it. We tried to combine the sense of participation, the contribution to the web community common good, and the willingness to maximize oneself outcomes in one general model.

We note some limitations of this study. First, future research is required for the distinction between the behavior of reading contents as a form of participation (for instance, by reviewing contents) and the use of contents and community resources by reading. For this reason it is necessary to develop a more effective measure of reading behavior and test what are the psychological processes that drive participation in virtual communities, in order to better understand the roles of *reader-free-riders* and *reader-participants*. It is necessary to focus more in details on the role that I-intentions and we-intentions have on the user's choice on how to use and to contribute in turn to the contents offered by the virtual community.

A further development is related to the understanding of the role of different intentional forces that drive the willingness to participate. In our study we considered the intentions toward the target goals as distinct between I-intentions and we-intentions. In addition, we-intentions to contribute and we-intentions to use community contents by reading directly influenced we-intentions to participate. It is plausible to imagine that this relationship could be actually better expressed through a second order factors model (see for a similar methodology Mari, 2006).

To conclude, it is important to deeper understand the distinction of these three behaviors and the role of intentions toward these behavioral goals, in order to better understand the factors that promote or inhibit online participation.

Finally, as in the previous study, in spite of the theoretical support and the choice of a longitudinal design, only a replication of our findings with an experimental design study would be able to establish and to confirm a causal direction for our effects. This is particularly important for the effects showed by the constructs of greed.

5 Conclusions

The Web 2.0 allows anyone with an Internet connection to join virtual communities. Users can create contents both alone and collaboratively, share their contents and comment on others' contents. There are various terms used to describe this phenomenon, including "social web" or "participatory web". Web 2.0 sites allow users to interact and collaborate with each other in a social media dialogue as contributors of user-generated content, in contrast to the previous websites generation where users were limited to the passive viewing of content that was created for them.

Nielsen (2006) analyzed the contribution process and described the inequality in the contribution as the tendency for most web community users to participate modestly, while only some community members represent the active part of content production. Nielsen found that user participation generally follows a ratio of 1% as active content producers, 9% as content modifiers and 90% of passive readers. Drawing from this issue, our research question was to better understand what are the factors that may inhibit a user from participating in a virtual community. Indeed, the comprehension of the reasons that may inhibit (or enhance) users participation is essential. Consider, for instance, virtual communities related to a commercial brand. Users participation become of primary importance, since the more users actively participate in the community, the easier for a company retaining its customers and sponsoring its products.

Previous research has shown that knowledge can be considered the main value exchanged in virtual communities. As described in Chapter 1, virtual communities offer a new way for knowledge exchange. Online communities can enhance the collective action of knowledge contribution, as suggested in several studies (Wiertz & de Ruyter, 2007).

In this work, the attention was focused mainly on the literature about the determinants of participation behavior, in particular the active contribution process and the individual use of resources by reading. We started from the research tradition on the attitude-behavior relation, analyzing the theory of planned behavior (Ajzen, 1991), which is one of the dominant models in the explanation of intentions in relation to behavioral goals. We then chose to adopt the model of goal-

directed behavior (Perugini & Bagozzi, 2001), which improved the theory of planned behavior focusing on the motivational processes that lead people to pursue a behavioral goal. Indeed, Perugini and Bagozzi (2001, 2004) maintained that TPB failed to explain how decisions to act become energized. Thus, they proposed that desire provides sufficient impetus to lead to intentions formations.

Since virtual communities by definition involve the action of a group as a collectivity, we considered, in addition to individual intentions, the construct of collective intentions (Tuomela, 1995). Bagozzi and colleagues (e.g., Bagozzi, 2011; Bagozzi & Dholakia, 2002; Bagozzi, Dholakia, & Pearo, 2006) used the same theoretical framework, showing that we-intentions predict active contribution behavior in virtual communities.

In this dissertation, composed by two empirical studies, we tried to deepen the understanding of the participation process in a virtual community, investigating the determinants that may inhibit or encourage this behavior goal.

The first study aimed at identifying the processes underlying the willingness to actively contribute to a virtual community. We considered a virtual community of practice, HTCBLOG.com that is a community for the disclosure and for the exchange of solutions of problems related to a specific smartphone brand; for this reason we talk of "topic oriented" community.

A first plus of the present study is that we used a measure of an actual behavior of contribution. However it is worthwhile noting that findings revealed a very low level of contribution behavior in this "topic-oriented" community. In fact, the active contribution was made only by a few users and by the administrators of the community, who lead the discussion topics.

We tested the model of goal directed behavior considering the we-intentions to contribute but the model did not predict the observed behavior. This may be due to the nature of the community, which is configured as a repository of information entered by a few users or experts and consulted by all other members.

The introduction of greed and anonymity to the MGB led to an increase in the explained variance accounted for the observed behavior (Figure 13). Thus greed and anonymity may have an important role in explaining the gap between intention and performance, especially in "topic-oriented" communities where the gap between the number of contributors and members is consistent.

In this study, as already shown by other authors (Bagozzi, 2011), we considered the active contribution goal as the only expression of the sense of participation in a virtual community. In the second study, following the suggestions offered by Antin & Cheshire (2010), we decided to deepen the meaning of participation concept. Participation in a virtual community is not necessarily identified by only active contribution. Indeed, an individual can feel as a part of the community, simply because, as a member, he/she may access and read community contents. Drawing from this assumption we hypothesized that participation might be divided in two distinctive behaviors: "active contribution" and "use of contents by reading".

Therefore, the second study aimed at identifying the processes underlying the participation process in virtual communities. We considered a discussion forum, PIPAM.org that is the Italian reference community for fly-fishing. In this community each user can start a discussion or new threads. Also for this study we used a measure of an actual behavior of contribution.

In a first step we tested the model of goal directed behavior for the active contribution goal. Differently from the previous study, we considered both the individual and collective intentions towards contribution in the same model. Findings reveal that only I-intentions predicted contribution (Figure 19). However, in this model, the predictive effects of individual intentions were absorbed by the past behavior of contribution. Note, that many discussions on PIPAM forum remain open for a long period of time or even are cyclical during a year. For this reason, many users participate in specific discussion, even for months, and not to others; for many PIPAM members it is customary to write on the forum asking information before a fishing trip. For these reasons we

hypothesize that the strong effect of past behavior for active contribution could be interpreted as function of habit (see Ouellette & Wood, 1998; Verplanken & Orbell, 2003).

The same theoretical model was then verified for the second target behavior: again, only I-intentions predicted the behavior (Figure 21).

To deeper investigate the role of different intentional processes, we tested a third model. We then focused our attention on the distinction of the three target processes: contribution, individual use of community contents by reading and participation, which our data clearly supported (Figure 23). We found that the we-intentions to participate were promoted by the we-intentions to contribute and by the we-intentions to use community contents by reading. Moreover, the participation behavior was predicted by we-intentions to participate as well as by the behaviors of contribution and community contents usage. The latter were influenced by the respective I-intentions and not by we-intentions. In this sense we assume that there was a collective intention to participate, which was expressed through the pursue of individual behavioral goals. Greed confirmed the negative significant effects on contribution process, whereas it showed a positive effect on the use of contents by reading process.

Nowadays it has become habit for web designers to follow the web usability guidelines, when designing a website. Usability is a qualitative attribute that assesses how easy user interfaces are to utilize (see ISO 9241-11, 1998) . The word "usability" also refers to practices and methods for improving ease-of-use during the design of a web-site or a software artifact in general, which are often associated with its functionalities. However, when joining a virtual community people are not just using a web interface, but they are entering into a social dimension and social identity processes become relevant (Tajfel, 1981).

Our results confirmed that, in line with previous literature (Bagozzi 2011; Bagozzi & Dholakia 2002; Bagozzi & Lee 2002), participation process is the result of a complex set of interacting variables and that social factors have a very strong influence. It is worthwhile noting that the constructs of I intentions and we-intentions in our models were mainly predicted by variables

concerning the social dimension of the web community, such as the social identity and the group norms. For instance,

We think that it is relevant to consider such psychosocial aspects during the design of a web artifact that is addressed not only to a single user, but to a group of users. Although strategies that consider group dynamics are already adopted in the everyday practice, a deep theoretical reflection on these issues is still lacking. Based on these assumptions we want to offer a preliminary definition of the idea of *social usability* (see Preece & Stanoevska-Slabeva, 2000; Turner, Loveb, & Howellc, 2008 for a similar concept).

We describe social usability as a set of methods and practices that stems from socio-psychological theories which allow to design not only human-computer interactions, but also human to human and human to group interactions, mediated by a technology or a virtual environment. Psychosocial aspects are predominant elements in this preliminary definition. We think that social usability could be an important point of view during the design of a virtual community, because it assumes social interactions as fundamental. Preece (2004) suggested the term *socialbility*, a sort of interest focuses on social interaction. Communities with good *socialbility* have good social policies that support the community's purposes (Preece & Stanoevska-Slabeva, 2000). In the design of software products that should be used by a group of people, designers must take a step further.

We suggest moving from the user centered design paradigm (UCD; see also Abras, Maloney-Krichmar, & Preece, 2004; Wunsch-Vincent & Vickery, 2007) to a social interaction centered design (SICD) and to take into great account psychosocial aspects, like social identity or group norms while designing a social technology, such as a virtual community. It is necessary to define a series of practices and methodologies that can foster social usability in the design of web communities more precisely. The UCD can therefore be seen as a first requirement for the SICD. First of all, a web interface have to be usable and cognitively simple for the individual but it must also provide the instruments to easily interact at a group level with other members. Knowing which

psychosocial dynamics influence users' participation processes it is possible to design a user interface that allows to control those aspects that would normally inhibit (or promote) participation and contribution. It is possible to conceive to a new design paradigm that considers people as embedded in a social and relational virtual environment, expressing their identity both on the individual and social level.

6 References

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