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Psychological need satisfaction and well-being in first-person shooter clans: Investigating underlying factors

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ABSTRACT

Even though clan membership plays an important role in the context of playing first-person shooters, only little is known about the questions, what makes a clan membership attractive and what effects go hand in hand with a clan membership. The current study fills this gap by applying Self-Determination Theory to the context of playing in first-person shooter clans. 585 players of Counter-Strike clans were asked about their behaviors within their clans, the psychological needs clan-life potentially satisfies and the outcomes of playing in clans in terms of well-being. A path analysis shows that playing in a first-person shooter clan could help players to fulfill elementary psychological needs and at least in the short term induce well-being. These results give clear evidence that it is worth broadening the perspective of research on first-person shooters and not only to concentrate on the discussion about media violence and aggressiveness.

1. Introduction

First-person shooters are one of the commercially most successful genres of computer and video games (ESA, 2017). Due to the high amount of violence these games contain, research on them typically concentrated on investigating aggression effects (e.g. Barlett, Harris, & Baldassaro, 2007; Ferguson & Rueda, 2010; Frindte & Obwexer, 2003). An important aspect that has remained understudied so far is the social component of these games. First-person shooters are often not played in solitude, but against or together with others in the Internet or at LAN parties (Griffiths, Davies, & Chappell, 2003; Jansz & Martens, 2005; Jansz & Tanis, 2007). Accordingly, some studies showed that first-person shooters are much more social than one might think and that players of first-person shooters attach great importance to social aspects and motivations (Frostling-Henningsson, 2009; Ghuman & Griffiths, 2012; Jansz & Martens, 2005; Jansz & Tanis, 2007; Lehmann, Reiter, Schumann, & Wolling, 2008). Many first-person shooter players join persistent gaming communities called clans which provide an environment for playing together, but also for socializing and befriending fellow players (Jansz & Tanis, 2007; Reer & Krämer, 2014; Trepte, Reinecke, & Juechems, 2012). Jansz and Tanis (2007) surveyed a sample of 751 users of online first-person shooters and found that more than 80% of the participants were members of a clan.

Given the important role clans obviously take, we think that it is insufficient to only concentrate on the act of playing itself when investigating effects of first-person shooters. To increase the understanding of the outcomes connected with the usage of first-person shooters, a more holistic and comprehensive approach is needed that also considers the social groups surrounding these games. Further, to enable deeper insights into the question why players use first-person shooters and become members of a clan, it is necessary to examine psychological benefits connected to the engagement in such groups, instead of solely concentrating on possible negative effects of playing.

Aiming at widening the perspective on outcomes of playing first-person shooters, the current study applies self-determination theory (SDT) to the context of clans. Based on a sample of 585 clan players, it is examined how different types of behaviors within these groups are connected with the satisfaction of the basic psychological needs for competence, relatedness and autonomy. Further it is investigated, whether clan-based need satisfaction is positively connected to increases in players' well-being.

In the following paragraphs, SDT will briefly be introduced before explaining in detail why we think that this theory is useful in

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explaining engagement in clans and the psychological benefits connected to it.

1.1. Self-determination theory and games

In general, SDT is a "theory of motivation that systematically explicates the dynamics of human need, motivation, goal-oriented behaviors, and well-being" (Shen, Liu, & Wang, 2013, p. 185). SDT specifies three fundamental psychological needs: autonomy, relatedness and competence (e.g. Ryan & Deci, 2000a; 2000b; Deci & Ryan, 2000; 2008). The main idea of SDT is that the wish to fulfill these three basic psychological needs is an important driver of human beings' behaviors: need satisfaction is intrinsically motivating, makes activities enjoyable and is knit to positive psychological outcomes. Thus, successful need fulfilment has been shown to facilitate mental health and to contribute to enjoyment and well-being in a wide spectrum of activities and life-domains like the workplace (e.g. Deci et al., 2001; Moreau & Mageau, 2012; Van Den Broeck, Vansteenkiste, DeWitte, & Lens, 2008), sports and exercises (e.g. Adie, Duda, & Ntoumanis, 2012; Carpentier & Mageau, 2013; Quested et al., 2013; Wang & Liu, 2007; Wilson, Longley, Muon, Rodgers, & Murray, 2006) or health care (e.g. Custers, Westerhof, Kuin, & Riksen-Walraven, 2010; Ng, Ntoumanis, Thøgersen-Ntoumani, Stott, & Hindle, 2013).

Recent studies have used SDT as a framework to analyze the motivations for using interactive media like the Internet (e.g. Shen et al., 2013; Zhao, Lu, Wang, & Huang, 2011), Facebook (e.g. Masur, Reinecke, Ziegele, & Quiring, 2014; Reinecke, Vorderer, & Knop, 2014), or computer and video games (e.g. Przybylski, Weinstein, Ryan, & Rigby, 2009b; Przybylski, Ryan, & Rigby, 2009a, 2010; Reinecke et al., 2012; Rieger, Wulf, Kneer, Frischlich, & Bente, 2014; Tamborini, Bowman, Eden, Grizzard, & Organ, 2010; Tamborini et al., 2011) and to investigate the outcomes of using them in terms of psychological health, well-being and enjoyment. For example, Ryan, Rigby, and Przybylski (2006) conducted 3 laboratory experiments and an additional survey study and showed that playing computer and video games can satisfy the needs for competence, relatedness and autonomy and that game-based need satisfaction is positively related to enjoyment and pre-to post-play changes in different indicators of well-being like vitality, mood/affect or state self-esteem. Our study is the first attempt to apply SDT to the context of online gaming communities and to investigate the role of psychological need satisfaction for the outcomes of playing in first-person shooter clans.

1.2. Clans and need satisfaction

There are many good reasons to believe that a membership in an online gaming community like a clan could help players to satisfy their needs for autonomy, relatedness and competence. Some of the most important arguments for such an assumption will be explicated in the following.

According to SDT, the need for relatedness refers to human beings' innate wish to feel socially embedded and to "[…] love and care and to be loved and cared for" (Deci & Ryan, 2000, p. 231). It can be argued that online gaming communities like clans and guilds constitute a persistent social environment that exists beyond the game and enables social encounters and interactions among players. Accordingly, several authors pointed out that many first-person shooter clans do not only aim at professionalizing gaming and making competitions easier, but also fulfill social functions (e.g. Geisler, 2009; Jansz & Martens, 2005; Jansz & Tanis, 2007). Thus, clans often consist of befriended players that know each other in real life and many clans regularly meet outside the Internet and for example visit LAN parties together (Geisler, 2009; Griffiths et al., 2003; Jansz & Martens, 2005). Quantitative survey studies by Trepte et al. (2012) as well as by Reer and Krämer (2014) showed that a clan membership in general fosters positive social outcomes of playing and that the participation in joint clan activities like for example training for matches with clan mates or taking part in offline meetings of the group is positively related to social capital acquisition and the development of friendships. These are clear indications that a membership in a first-person shooter clan bears a high social potential, enhances the social embeddedness of players and thus should most likely be helpful in fulfilling relatedness needs.

The second need described in SDT, the need for competence, refers to the natural wish to feel effective and skilled and to achieve valuable goals (Deci & Ryan, 2000). A membership in a clan ought to be helpful for players in fulfilling their competence needs in several ways. In the first instance, clans constitute a forum where players could share their knowledge about the game. For example, an interview study by Rambusch, Jakobsson, and Pargman (2007) found that when Counter-Strike players join a clan "new levels of communication and strategic thinking skills become necessary and 'available' only through sustained interaction within and between teams" (p. 160). Clan members are typically both - teachers and learners - and better their playing skills through mutual exchanges with the other members of their clan (Rambusch et al., 2007).

Game-related conversations between clan members could be considered useful in terms of fulfilling competence needs for experienced as well as for inexperienced players: Firstly, inexperienced players could improve their playing skills by obtaining information from more experienced players of their clan and, as a consequence, should increase their chances to experience success and competence when playing. And secondly, veteran players could profit from sharing their knowledge with less skilled players through the recognition and respect they experience in their clans. Since clans constitute a persistent group of players that regularly plays together, a clan membership also enhances the possibilities for coordinated team play and the adoption of more strategic playing approaches (e.g. Duell, 2014; Rambusch et al., 2007). Another aspect of clan-life that certainly bears a high potential for the satisfaction of the need for competence is the possibility to engage in managing and leading the group. Players that take the prestigious role of a clan leader or server administrator are normally treated with respect and enjoy a high status within the group (e.g. Geisler, 2009).

Autonomy (the third need described in SDT) refers to the wish to develop freely, "to self-organize experience and behavior and to have activity be concordant with one's integrated sense of self" (Deci & Ryan, 2000, p. 231). Since players normally do not receive any monetary rewards for playing in clans (apart from a very small group of professional players), the engagement in clan activities is a typical example of an intrinsically motivated behavior. Such intrinsically motivated behaviors "[…] represent the prototype of self-determined activities: They are activities that people do naturally and spontaneously when they feel free to follow their inner interests" (Deci & Ryan, 2000, p. 234). Since intrinsic motivation and the satisfaction of autonomy needs are closely linked to each other (e.g. Deci & Ryan, 2000) one can conclude that a clan membership, due to its voluntary nature and the fact that joining a clan in general is the result of a free decision, could per se be interpreted as an expression of a self-regulated behavior that satisfies the need for autonomy.

Further, like other leisure time activities, spending time with clan-life offers the possibility to temporarily escape from everyday life and its restrictions. Escapism has often been identified as an important motivation for playing games (e.g. Yee, 2006a, 2006b). Joining a clan should even enhance the escapism-potential of

gaming, since clan-life does not only mean playing together, but additionally offers a wide spectrum of other activities that one could engage in to step out of one's daily routines. This high escapism potential has relevance for the satisfaction of autonomy needs since it offers an opportunity to leave behind the feeling of being controlled and pressured many people suffer from in their everyday working (or school) life.

Taken together, the above considerations suggest that a membership in a clan bears a high potential for the satisfaction of the basic needs described in SDT. The general idea of the following analysis is to further investigate need satisfaction in clans by empirically examining its underlying factors as well as its outcomes in terms of well-being. Thus, a path model (see Fig. 1) was created that includes five different behaviors within clans and their assumed connections with need satisfaction in clan-life. The second level of the model tests whether need satisfaction in clan-life is (in line with SDT) positively related to increases in short-term well-being after spending time with clan-life. A detailed explanation of the hypotheses will be provided in the following section.

2. Questions and hypotheses

As described above, some behaviors within clans supposedly take a particularly important role for the satisfaction of the three needs described in SDT. Among these are conversations with clan mates about playing tactics, participation in clan offline meetings or the engagement in clan administration. In the following analysis, in total five of these potential underlying factors of need satisfaction in clans will be considered.

The first set of hypotheses addresses the connection between taking over administrative tasks of a clan and need satisfaction in clan-life. In the current analysis, we distinguish two different types of administrative engagement in clans: organizing and leading the group and taking over a technical function like administrating the game servers of a clan.

Organizing and leading the group is hypothesized to have a positive connection with the satisfaction of all three types of needs. As Geisler (2009) found in an interview study with members of first-person shooter clans, in most clans all important decisions are only made with consent of the leaders. For example, leaders decide about the frequency of trainings and the participation of the clan in competitions and leagues, or solve conflicts within the group and ensure that all members keep the rules of the clan (Geisler, 2009, p. 201). The great scope of influence leaders have within their clans should likely contribute to the satisfaction of autonomy needs:

H1a. Organizing and leading is positively related to the satisfaction of the need for autonomy.

The leaders are typically the most well-known members of a clan and serve as contact persons for the other members. Due to the central position clan leaders have within their clan, they should also profit in terms of satisfying their need for relatedness. As shown by Trepte et al. (2012) as well as by Reer and Krämer (2014), involvement in organizing a clan enhances the chances of friendship formation and social capital acquisition. Accordingly, it is hypothesized that organizing and leading is positively related to the satisfaction of the need for relatedness:

H1b. Organizing and leading is positively related to the satisfaction of the need for relatedness.

Clan leaders hold a position of power within their clan and have influence on nearly all aspects of clan-life (Geisler, 2009). Further, the role of the clan leader is a very prestigious position and leaders are normally treated with a lot of respect by the other members. Thus, it seems very plausible that taking over a leading position within a clan should also be relevant in terms of satisfying the need for competence:

H1c. Organizing and leading is positively related to the satisfaction of the need for competence.

Besides organizing and leading the group, another important facet of clan-life concerns the more technical aspects. Within a typical first-person shooter clan, a group of players takes care of the proper functioning of the infrastructure like the game servers or the web servers. Even though taking over one of these more technical administrative positions is less prestigious than being one of the leaders, server administrators or web administrators nevertheless have more influence and more possibilities to actively shape the course of the clan than common members and thus should experience more freedom, self-actualization and autonomy in their clan:

H2a. Sharing technical expertise is positively related to the satisfaction of the need for autonomy.

Since the responsibility of web administrators or game server administrators is limited to the technical functioning of the clan's infrastructure, these positions are less central than the ones of the more or less omnipresent clan leaders. Thus, sharing technical expertise should be less relevant in terms of fulfilling the need for relatedness. However, contributing one's technical expertise and solving technical issues of the clan should positively contribute to the satisfaction of the need for competence:

H2b. Sharing technical expertise is positively related to the satisfaction of the need for competence.

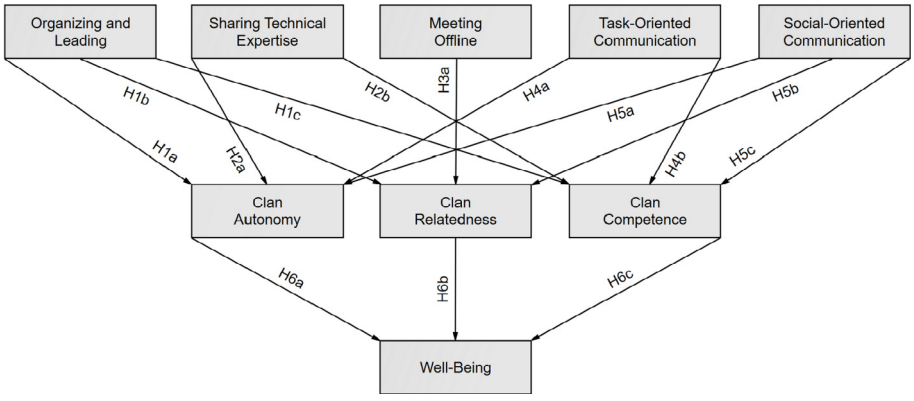

Fig. 1. Predicted path model with hypotheses.

Besides taking over an administrative position within a clan, another facet of clan-life that should be relevant in terms of satisfying psychological needs is the participation in offline meetings of the clan. Many clans regularly meet outside the Internet and for example participate in LAN-parties (e.g. Geisler, 2009; Jansz & Martens, 2005). Participating in such offline meetings has been shown to positively influence the deepening of the relationships of clan mates (Trepte et al., 2012; Reer & Krämer, 2014; Geisler, 2009, p. 229ff.) and thus is expected to contribute to the satisfaction of relatedness needs:

H3a. Participating in clan offline meetings is positively related to the satisfaction of the need for relatedness.

The remaining two underlying factors of need satisfaction in clans that will be considered in the analyses concern the communication that takes place between clan members. Based on existing literature (Geisler, 2009, p. 189; Peña & Hancock, 2006; Thon, 2006, 2007), two different types of clan-communication were distinguished in the path-model: task-oriented communication and social-oriented communication.

Task-oriented communication for example relates to talking about playing tactics or tips on how to improve playing skills. Talking with clan mates about playing tactics and participating in expert discussions about the game is expected to foster the satisfaction of competence needs, since it should help players to improve their playing skills. Further, using the clan as a forum to express one's own opinion about game-related topics should likely also satisfy autonomy needs.

H4a. Task-oriented communication is positively related to the satisfaction of the need for autonomy.

H4b. Task-oriented communication is positively related to the satisfaction of the need for competence.

Social-oriented communication for example relates to talking about real-life problems or other private topics. To feel no pressure to hide one's private life and to feel free to reveal personal information towards clan mates is indicative of an unconstrained and trustful atmosphere and should likely be positively related to the satisfaction of autonomy needs:

H5a. Social-oriented communication is positively related to the satisfaction of the need for autonomy.

The mutual disclosure of private information has often been proven to be an important factor of relationship formation (e.g. Altman & Taylor, 1973; in the context of gaming: e.g.; Reer & Krämer, 2014, 2017; Sung, Sigerson, & Cheng, 2017). Thus, talking about personal issues should foster a feeling of closeness between clan members and hence should contribute to the satisfaction of the need for relatedness:

H5b. Social-oriented communication is positively related to the satisfaction of the need for relatedness.

Being trusted by other clan mates and being considered qualified to discuss someone else's private issues and problems ought to give one the feeling of being socially competent and a person of integrity. Thus, social-oriented communication likely should also bear a potential for the satisfaction of the psychological need for competence:

H5c. Social-oriented communication is positively related to the satisfaction of the need for competence.

In line with the assumptions of SDT (e.g. Deci et al., 2001; Reis, Sheldon, Shelly, Roscoe, & Ryan, 2000; Wilson et al., 2006), the second level of the model assumes that satisfying the needs for autonomy, competence and relatedness in clan-life is positively related to short-term well-being after spending time with clan-life:

H6a. Satisfying autonomy needs in clan-life is positively related to short-term well-being after spending time with clan-life.

H6b. Satisfying relatedness needs in clan-life is positively related to short-term well-being after spending time with clan-life.

H6c. Satisfying competence needs in clan-life is positively related to short-term well-being after spending time with clan-life.

Lastly, it is hypothesized that the five investigated underlying factors of need satisfaction have a significant indirect effect on short-term well-being:

H7a. Organizing and leading indirectly influences short-term well-being via need satisfaction.

H7b. Sharing technical expertise indirectly influences short-term well-being via need satisfaction.

H7c. Meeting clan mates offline indirectly influences short-term well-being via need satisfaction.

H7d. Task-oriented communication indirectly influences short-term well-being via need satisfaction.

H7e. Social-oriented communication indirectly influences short-term well-being via need satisfaction.

3. Material and methods

The study was realized as an online survey. The game Counter-Strike was chosen as the object of investigation, since it is a very popular and prototypical online first-person shooter. To reach as many clan players as possible, two language versions of the questionnaire were implemented (English and German). Recruitment of the participants was done by posting links to the online survey on several game-relates websites, Facebook interest groups, forums and blogs. To make participation more attractive, coupons for a popular online-store were raffled among participants.

3.1. Sample

The final sample consisted of 585 Counter-Strike clan players. Nearly all of the participants were male (N = 572; 97.8%) and age ranged from 13 to 64 years with a mean of 21.99 years (SD = 5.38). Taking a closer look at the age distribution of the sample shows that 60.3% of the participants were 22 years and younger, 34.4% were between 23 and 30 years old, and only 5.3% of the participants were older than 30 years. However, since several existing studies have shown that first-person shooters are mostly played by young males (e.g. Jansz & Tanis, 2007; Lehmann et al., 2008; Nagygyörgy et al., 2013), the age and gender structure of our sample lies within the expectations and can be considered typical of the population of first-person shooter players.

3.2. Measurements

The questionnaire consisted of a combination of newly created items and items that were created based on existing scales. Since we had decided to provide a bilingual questionnaire, some English original scales had to be transferred into German. In a first step, these items were translated by the first author of the article. Then, to ensure the quality of the translation, a backtranslation and evaluation was performed by two external persons that have profound skills in both languages. Following the same procedure,

newly created German items were translated to English and then back-translated and evaluated.

3.2.1. Need satisfaction in clan-life

Need satisfaction in clan-life was measured with 12 items that were created based on two widely used SDT-based measurements of need satisfaction (La Guardia, Ryan, Couchman, & Deci, 2000; Ryan et al., 2006). All items were firstly edited to better fit the context of Counter-Strike clans and then were translated for the German version of the questionnaire. The participants were asked how they felt about their clan-life and had to rate the items on a seven-point scale ranging from 1 "not at all true" to 7 "very true". 3 negatively worded items were recoded before analysis. However, an investigation of Cronbach's Alpha showed that all 3 negative items were problematic and decreased the reliability of the corresponding subscales substantially. Therefore, these items were excluded from the analysis.

Of the remaining 9 items, 4 items addressed the satisfaction of the need for autonomy in clan-life (e.g. "In my clan, I have a say in what happens, and I can voice my opinion."), 3 items focused on the satisfaction of the need for relatedness (e.g. "I find the relationships I formed in my clan fulfilling.") and 2 items measured the satisfaction of competence needs ("In my clan, I feel like a competent person."). Since the Cronbach's Alpha for all subscales was within acceptable range, the scores of the corresponding items were summed up and averaged for further steps (autonomy: $M = 5.68$, $SD = 1.06$, $\alpha = 0.728$; relatedness: $M = 5.34$, $SD = 1.24$, $\alpha = 0.801$; competence: $M = 5.68$, $SD = 1.15$, $\alpha = 0.720$).

3.2.2. Well-being

Two different indicators of well-being were considered in the current analyses: positive affect and state self-esteem.

Positive affect was measured with 5 items on how one feels (e.g. "proud", "happy") taken from Diener and Emmons (1984) scale of affect and a modified version used by Shen et al. (2013). Using a five-point scale ranging from 1 "never" to 5 "always" participants were asked to indicate how often they felt that way when they had spent time with their clans. With Cronbach's $\alpha = 0.827$ positive affect showed a good internal reliability ($M = 4.07$; $SD = 0.68$). Mean scores were calculated and saved for further steps.

As a second indicator of well-being state self-esteem was measured with 11 items taken from the sub-dimensions *performance* and *social* of the state self-esteem scale by Heatherton and Polivy (1991). The items were presented with a five-point scale ranging from 1 "never" to 5 "always" and participants were asked to indicate how often they felt that way when spending time with their clan (e.g. "When spending time with my clan, I feel as smart as others", "When spending time with my clan, I am worried about whether I am regarded as a success or failure" *reverse*). After recoding negative items, item scores were summed up, averaged and saved for further steps ($M = 4.07$, $SD = 0.66$, $\alpha = 0.826$).

3.2.3. Underlying factors of need satisfaction

A battery of 20 items was used to measure the five potential underlying factors of need satisfaction that were considered in the model. All of these items were presented with a five-point scale ranging from 1 = "strongly disagree" to 5 "strongly agree". The subscales consisted of 3–6 items per construct and addressed the involvement in organizing and leading the clan (e.g. "The clan provides me with the opportunity to contribute my organizational skills.", "I serve as a contact person in my clan when there are problems within the group."; Cronbach's $\alpha = 0.862$; $M = 3.05$; $SD = 1.00$), sharing technical expertise (e.g. "I like to take care of the technical aspects of clan-life (e.g. administrating the servers, administrating the website)."; Cronbach's $\alpha = 0.729$; $M = 3.34$; $SD = 1.07$), task-oriented communication (e.g. "I often talk with clan members about playing tactics."; Cronbach's $\alpha = 0.752$; $M = 3.48$; $SD = 1.01$), social-oriented communication (e.g. "I often talk about personal things with clan members."; Cronbach's $\alpha = 0.814$; $M = 3.62$; $SD = 1.05$) and participating in offline events (e.g. "I frequently participate in offline meetings of my clan."; Cronbach's $\alpha = 0.851$; $M = 2.79$; $SD = 1.14$). Item scores were summed up and averaged for further steps.

4. Results

As a first step, zero-order correlations among all variables were calculated (see Table 1). To test the hypothesized relationships between the different constructs, path analysis with maximum likelihood estimation was performed using SPSS Amos software package. Two different variants of the model were estimated: one with positive affect and one with state self-esteem as the central outcome variable. Since the five underlying factors of need satisfaction showed significant correlations (see Table 1), they were allowed to co-vary in both reported models. For the same reason, the error terms of clan autonomy, clan relatedness and clan competence were allowed to co-vary.

Univariate and multivariate normality were checked based on the cut-off criteria recommended by Kline (2011) and Byrne (2010). For all variables, the absolute values for skewness and kurtosis lay below 3.0 (skewness) and 8.00 (kurtosis), thus no substantial deviations from univariate normality were detected. However, within both models, Mardia's normalized coefficient of multivariate kurtosis lay above the recommended cut-off value of 5.0. As recommended by Byrne (2010) for non-normal distributed data, the significance of all reported path weights was thus additionally tested by using Amos' bootstrapping function (2000 bootstrap samples). Bootstrapping estimation confirmed the significance/non-significance of all reported path weights ($p < .05$ level).

4.1. Model 1: positive affect

The result of the maximum likelihood estimation of model 1 is shown in Fig. 2. The model explains 28% of the variance in clan autonomy ($R^2 = 0.28$), 36% of the variance in clan relatedness ($R^2 = 0.36$), 22% of the variance in clan competence ($R^2 = 0.22$) and 35% of the variance in positive affect ($R^2 = 0.35$).

Model fit was evaluated based on established cut-offs for RMSEA (<0.06; Hu & Bentler, 1999), CFI (>0.95; Hu & Bentler, 1999) and CMIN/df (<2.00; Byrne, 1989). With RMSEA = 0.040 (90% confidence interval from 0.006 to 0.068), CFI = 0.996 and CMIN/df = 1.91 model 1 shows a good fit.

4.1.1. Direct effects

Hypotheses H1a/1b/1c predicted positive connections between organizing and leading and all three types of need satisfaction. These assumptions were affirmed with $\beta = 0.19$ ($p < .001$) for clan autonomy, $\beta = 0.17$ ($p < .001$) for clan relatedness and $\beta = 0.12$ ($p < .05$) for clan competence. Conforming H2a/2b, sharing technical expertise was positively connected to clan autonomy ($\beta = 0.11$, $p < .01$) as well as to clan competence ($\beta = 0.12$, $p < .01$). As predicted by H3a, meeting offline shows a positive connection with clan relatedness ($\beta = 0.16$, $p < .001$). Hypotheses H4a/4b were also affirmed with task-oriented communication having a significant positive effect on clan autonomy ($\beta = 0.09$, $p < .01$) and clan competence ($\beta = 0.19$, $p < .001$). Approving H5a/5b/5c, social-oriented communication was a significant predictor of clan autonomy ($\beta = 0.29$, $p < .001$), clan relatedness ($\beta = 0.42$, $p < .001$) and clan competence ($\beta = 0.19$, $p < .001$). Positive affect as the central outcome variable of model 1 was found to be predicted by

Table 1
Means, standard deviations and Pearson-correlations.

	M	SD	1	2	3	4	5	6	7	8	9	10
1. Organizing and leading	3.05	1.00	–									
2. Sharing technical expertise	3.34	1.07	.612**	–								
3. Meeting offline	2.79	1.14	.265**	.214**	–							
4. Task-oriented communication	3.48	1.01	.428**	.447**	.258**	–						
5. Social-oriented communication	3.62	1.05	.438**	.341**	.454**	.318**	–					
6. Clan autonomy	5.68	1.06	.423**	.384**	.230**	.350**	.442**	–				
7. Clan relatedness	5.34	1.24	.392**	.303**	.397**	.299**	.564**	.705**	–			
8. Clan competence	5.68	1.15	.360**	.361**	.212**	.388**	.345**	.643**	.614**	–		
9. Positive affect	4.07	.68	.314**	.236**	.195**	.303**	.353**	.514**	.566**	.426**	–	
10. State self-esteem	4.07	.66	.058	.107**	.126**	.049	.117**	.269**	.181**	.268**	.120**	–

**p < .01.
*p < .05.

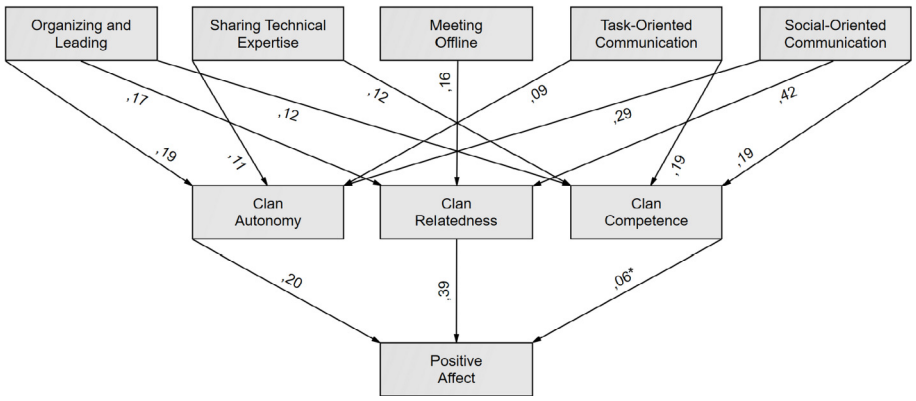

Fig. 2. Path model for positive affect. All reported standardized beta coefficients are significant at least with p < .05. * p = .216. Note: Error terms and covariances were faded out to increase clarity.

clan autonomy (β = 0.20, p < .001) and clan relatedness (β = 0.39, p < .001). However, there was no significant connection found between clan competence and positive affect (β = 0.06, p = .216). Therefore, H6a/6b were affirmed, while H6c has to be rejected.

4.1.2. Indirect effects

Hypotheses H7a/7b/7c/7d/7e addressed the assumption that the five investigated underlying factors of need satisfaction in clans indirectly influence positive affect via need satisfaction. To test these indirect effects, bootstrapping with 2000 bootstrap samples and a bias-corrected confidence level of 90% was performed. As predicted by H7a/7b/7c/7d/7e, all five underlying factors indirectly influenced positive affect via the satisfaction of the needs for autonomy, relatedness and competence: Leading and organizing (β = 0.11; p < .001; 90% bias-corrected confidence interval from 0.07 to 0.15), sharing technical expertise (β = 0.03; p < .001; 90% bias-corrected confidence interval from 0.01 to 0.05), meeting offline (β = 0.06; p < .001; 90% bias-corrected confidence interval from 0.04 to 0.09), task-oriented communication (β = 0.03; p < .01; 90% bias-corrected confidence interval from 0.01 to 0.06) and social-oriented communication (β = 0.23; p < .001; 90% bias-corrected confidence interval from 0.19 to 0.28) were all significantly connected to positive affect via need satisfaction.

4.2. Model 2: state self-esteem

Model 2 is displayed in Fig. 3. The model explains 9% of the variance in state self-esteem ($R^2 = 0.09$). Variance explanation in need satisfaction and the significance of H1-5 will not be reported again, since this part of the model is identical to model 1.

With CMIN/df = 1.87, CFI = 0.996 and RMSEA = 0.039 (90% confidence interval from 0.000 to 0.067) model 2 fits the data very well.

4.2.1. Direct effects

Hypotheses H6a/6b/6c assumed that the three different types of need satisfaction are positively connected to state self-esteem. With β = 0.20 (p < .001) for clan autonomy and β = 0.18 (p < .001) for clan competence, H6a and H6c were supported by the data. However, H6b had to be rejected: there was no significant link found between clan relatedness and state self-esteem (β = −0.08, p = .188).

4.2.2. Indirect effects

To test for the indirect effects the five underlying factors of need satisfaction had on state self-esteem via autonomy, competence and relatedness, bootstrapping was performed with 2000 bootstrapping samples and a bias-corrected confidence level of 90%. Hypotheses H7a/7b and H7d/7e were affirmed: state self-esteem was indirectly influenced by leading and organizing (β = 0.05; p < .001; 90% bias-corrected confidence interval from 0.02 to 0.08), sharing technical expertise (β = 0.05; p < .001; 90% bias-corrected confidence interval from 0.03 to 0.07), task-oriented communication (β = 0.05; p < .001; 90% bias-corrected confidence interval from 0.03 to 0.08) and social-oriented communication (β = 0.06; p < .01; 90% bias-corrected confidence interval from 0.03 to 0.10). In contrast to that, H7c was not supported by the data: meeting offline (β = -0.01; p < .174; 90% bias-corrected confidence interval from −0.03 to 0.00) did not have a significant indirect effect on state self-esteem.

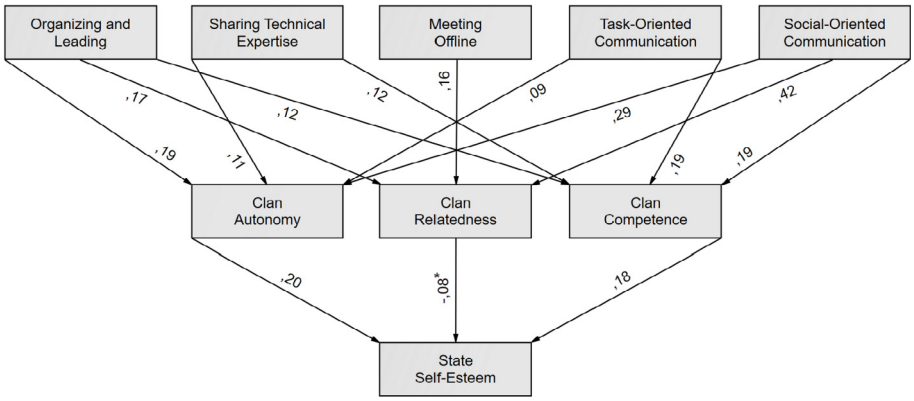

Fig. 3. Path model for state self-esteem. Untagged reported standardized beta coefficients are significant at least with $p < .05$. * $p = .188$. Note: Error terms and covariances were faded out to increase clarity.

5. Discussion

The central idea of the current analysis lay in investigating the psychological benefits a membership in a first-person shooter clan could have. To do so, SDT was applied to the context of Counter-Strike clans. In detail, five types of clan-related behaviors were considered as underlying factors of the satisfaction of the psychological needs for competence, relatedness and autonomy. Further, connections between need satisfaction in clan-life and two indicators of short-term well-being after spending time with clan-life (state self-esteem, positive affect) were examined.

The results of the path analysis revealed that all of the five underlying factors considered in the model were significantly connected to the satisfaction of the basic psychological needs described in SDT. Especially helping in leading and organizing the group and talking with clan mates about private issues and problems proved to be very valuable in terms of satisfying psychological needs within clans and were positively connected to all three types of need satisfaction. Task-oriented communication and contributing technical expertise foster the satisfaction of the needs for competence and autonomy, but seem to be less important in terms of satisfying the need for relatedness. However, fulfilment of the need for relatedness was found to be predicted by meeting clan mates offline.

Parts of these results confirm findings of previous studies on first-person shooter clans: meeting offline and engagement in clan administration have been shown to be important drivers of building up relationships in clans and gathering social capital (Reer & Krämer, 2014; Trepte et al., 2012). It therefore is not surprising that these behaviors are important for the satisfaction of the need for relatedness. Also, the positive effect of social-oriented communication on relatedness is in line with previous findings that communication in general and especially talking about private issues and disclosing private information foster positive social outcomes for gamers (Reer & Krämer, 2014, 2017; Sung et al., 2017).

The analysis furthermore shows that a membership in a clan is not only beneficial in terms of befriending fellow players, but that clans also provide a ground for the satisfaction of the needs for autonomy and competence. The wide spectrum of possibilities to participate actively in clan-life, like for example to contribute technical expertise, to talk about playing tactics or to engage in organizational issues, offers a fruitful way to fulfill fundamental psychological needs. These findings are in line with the hypotheses outlined in Section 2 and are very plausible on a theoretical level. For example, helping with leading and organizing a clan offers a sphere of influence that comprises nearly all aspects of clan-life (Geisler, 2009, p. 201) and bears the potential to experience power, self-efficacy and self-fulfillment. Expert conversations with clan mates about playing tactics (task-oriented communication) offer the possibility to express one's own opinion on game-related topics, are helpful for inexperienced players to better their skills, and increase the chances for collective as well as individual success in gaming (e.g. Duell, 2014; Rambusch et al., 2007). Also of note is the potential of social-oriented communication to satisfy autonomy and competence needs. Talking about personal issues and disclosing private information towards fellow players obviously does not only increase the feeling of closeness among clan members (and thus leads to the satisfaction of relatedness needs), but also gives one the feeling of being (socially) skilled and accepted (or in other words: *free to be who you really are*).

The expected influences of need satisfaction within clans on short-term well-being were also affirmed with relatedness and autonomy being connected to positive affect and competence and autonomy being connected to state self-esteem. These findings are in line with a huge number of existing SDT-based studies on other types of activities which have proved that successful need satisfaction fosters well-being (e.g. Ryan et al., 2006; van den Broeck et al., 2008; Adie et al., 2012; Wilson et al., 2006).

The revealed indirect effects of specific behaviors within clans via need satisfaction on well-being additionally underline the positive psychological benefits that clan-life could evoke and augment several SDT-based studies on playing computer games (e.g. Ryan et al., 2006; Tamborini et al., 2010) by providing a plausible explanation why the membership in a gaming community is attractive to so many players. Since previous work on other types of voluntary engagement have shown that need satisfaction plays an important role for the motivation of volunteers (e.g. Gagné, 2003; Haivas, Hofmans, & Pepermans, 2012; Haivas, Hofmans, & Pepermans, 2013), the possibility to satisfy psychological needs and to increase one's well-being could further be considered a reason why a lot of clan members do not only play together with clan mates, but additionally voluntarily engage in administrating the group.

Showing that engagement in clans is connected with the satisfaction of essential psychological needs and the induction of short-term well-being does not only deepen the general understanding of the psychology of playing multiplayer games, but in our opinion also has some important practical implications. On the one hand, game developers could profit from our findings by learning more about what makes gaming attractive and how they could support players in gaining an optimal experience. In concrete, our results suggest that the attractiveness of games (and in particular of first-

person shooters) can be increased by offering the players with opportunities to easily build social groups and structures surrounding the game. However, on the other hand, our findings might also be interesting for researchers and practitioners working in the field of media education (and in particular in the field of games addiction). Given the possibilities clans offer in terms of need satisfaction, it might be possible that players with problems in satisfying their psychological needs for competence, relatedness and autonomy in their offline lives could try to compensate for these deficits online and might therefore form a particular at-risk group for the development of an unhealthy, overdosed clan engagement. In this context, it would be an interesting task for future analyses to investigate how offline characteristics of players are connected to clan engagement and need satisfaction in clans.

5.1. Limitations

The study is subject to some general limitations. Firstly, a cross-sectional design was chosen. This approach is able to offer an impression of the relationships between the different elements of the model, but does not allow making causal attributions. Thus, long-term investigations on need satisfaction in clans are necessary to confirm the results. Further, the participants were recruited by spreading links in the Internet. This self-recruitment is not suitable to generate a representative sample. Another limitation lies in the usage of self-reports to measure players' behaviors within clans and the psychological outcomes they experienced. Self-reports always carry the risk to produce misinformation and should ideally be supplemented with behavioral data.

More specific limitations of the current study concern the scales and the sample we used. For example, only two indicators of well-being were considered in the analyses. Another task for future studies could lie in including other facets and measurements of well-being, like for example vitality or life satisfaction. Further, only five different types of behaviors within clans were considered as underlying factors of need satisfaction. Other types of clan-related behaviors like participating in professional leagues or tournaments also bear a high potential for the satisfaction of psychological needs and may be added to augment the model. And lastly, the study only concentrated on Counter-Strike as a prototypical and well-known multiplayer first-person shooter. However, before one can draw any general conclusions, the model should additionally be tested with player samples stemming from online gaming communities of other games and other genres. In this context, one should also keep in mind that some of the direct and indirect connections we identified in our analyses were significant, but rather small. This makes it even more important to confirm our findings using other player samples.

5.2. Conclusions

Taken together, being the first attempt to apply SDT to the context of online gaming communities, the analysis gives clear evidence that playing in a first-person shooter clan could have positive psychological effects and could help players to increase their well-being by satisfying elementary psychological needs in clan-life. These findings, of course, should not be misinterpreted in the sense that it is no longer necessary to discuss and investigate negative effects playing games (and playing first-person shooters in particular) may have. However, the results clearly indicate that it is important to broaden the perspective in order to provide a more adequate understanding of the players, their reasons for playing, and their fascination with first-person shooters. Given the increasing popularity of online games and multiplayer modes, future studies on effects of digital games should in general more often consider behaviors and interactions taking place within social groups surrounding the games, instead of only concentrating on examining the act of playing itself.

Disclosure statement

The authors state that no competing financial interests exist.

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