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Friending and Goal Attainment: An Empirical Study in Virtual World

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Abstract

Encouraging individual goal pursuit through social influence is a growing trend. While friendships can be both an asset but also a burden, the impact friends have on goal attainment is not well established in the literature. We explore the influence that friend quantity and quality have on individual task-oriented goal-directed behavior using a unique set of online gaming data with a sample of about 33,000 individuals. Our results indicate a nonlinear relationship that suggests the number as well as the intimacy level of friendships positively impact individual goal achievement, but too much social friending becomes detrimental to individual goal pursuit. Females benefit slightly more from friendship amount and intimacy level, but also suffer more from too many exchanges with friends. Similarly, novice individuals not only benefit more from social influence than more experienced individuals in terms of goal pursuit, but also hurt more from friending behaviors. Our follow-up surveys with actual gamers provide additional evidence that friends indeed proffer information and emotional support that can promote goal attainment. However, too much friending can hurt goal completion due to information overload and time demands. These findings have important implications for consumers and managers regarding how social others influence individual goal attainment.

Keywords: *social influence, goals, online gaming, friendship, new technology, e-commerce*

1. INTRODUCTION

Goal attainment has received extensive research attention. Prior studies have mainly focused on individual factors that facilitate goal achievement. These *personal* factors include expectations (Battle 1965), self-efficacy (Bandura and Locke 2003), commitment (Klinger 1980), rewards (Deci and Ryan 2000), and perceived progress (Huang et al. 2012).

Recently, to help individuals achieve their goals, firms have adopted an *interpersonal* approach. For example, Cross Fit exercises and Facebook games rely on social others to help individuals achieve goals. The intuition is that social interactions, especially those with friends, reduce the likelihood that individuals quit before accomplishing their goals. Indeed, today's highly connected world implicates a critical role of friends on individual goal achievement.

Interestingly, friendship may be a double-edged sword for individual endeavors. On one hand, friends can encourage and motivate individuals by providing useful information and emotional support (Van Dierendonck 1998). On the other hand, friends can generate information overload and demand emotional commitment (Bandura and Locke 2003; Freeman et al. 1987). As such, friends can be both an asset and a liability to a person's goal attainment.

To our knowledge, little attention has been paid to the role of friends in goal attainment. The aim of our research is to investigate this relationship. Specifically, can friendship help an individual achieve the goal at hand? What are the benefits and tradeoffs of this social influence for individual goal attainment?

Whether friendship is beneficial or detrimental to goal achievement may be of particular interest to consumers and managers. Prior research has examined the role of friendship in commercial settings (Price and Arnould 1999). It is also noted that friendship can both positively and negatively impact business relationships (Grayson 2007). While these studies explore the general influence of friendship on business, they do not specifically address its role in goal attainment. The answer to these questions could better inform managers of how to encourage goal achievement by carefully leveraging social influence.

The contributions of this research are threefold. First, we advance the goal literature by a) extending the focus from individual factors to social factors and b) investigating both the costs and benefits of friendship simultaneously on individual goal pursuit. Second, we quantify goal advancement and friendship with large-scale, real-world data, rather than small-scale, self-reported data. Our data is unique in that it quantifies the goals of individual gamers with over 33,000 participants. Third, we test the boundary conditions of gender and experience to further reveal the nuanced influence of social others on individual goal achievement.

2. GOAL ATTAINMENT

A goal is an established objective that an individual strives to achieve (Locke and Latham 1990). Much of the research on goal pursuit and attainment has focused on individual-level factors (e.g., Bagchi and Li 2011). These include self-efficacy (Bandura and Locke 2003), rewards (Deci et al. 1999), implementation plans (Gollwitzer and Brandstatter 1997) and goal progress (Zhang and Huang 2010). Indeed, individuals rely on different means to further their goal progress (Shah and Kruglanski 2003). For instance, when goal progress is high, means with less variety will boost an individual's motivation to pursue the goal (Etkin and Ratner 2012).

In the psychology literature, goal attainment and task persistence are driven by levels of expectancy and minimal goals. Expectancy refers to the likelihood of reaching an objective as a result of specific behaviors directed towards that objective. Accordingly, the higher the level of expectancy for success, the more an individual will persist towards the goal (Battle 1965). While goal perseverance may be influenced by self-interest and motivation, it may also be influenced by social others. For instance, an

individual may exert more effort towards a goal if she believes that doing so is socially acceptable (Bandura 1988). Furthermore, people may pursue their goals in order to attain social approval.

Despite the abundance of research on individual motivators, few studies have examined how social others influence individual goal-directed behavior. Social influence can impact a person's decision-making, choices, and actions. Thus, social others can play a critical role in an individual's goal pursuit. For example, cooperating with others can increase the likelihood of achieving goals (Johnson et al. 1979). Furthermore, the mere presence of others stimulates arousal and intensifies personal drive in goal pursuit (Guerin 1986; Zajonc 1965). Therefore, social others can have a positive, motivating influence on individual goal attainment.

Nevertheless, social others can also complicate one's goal attainment. For example, task performance was shown to decline when individuals were in the presence of others due to social distraction (Shalley 1995). In the marketing literature, Kirmani and Campbell (2004) suggest that social influence can be beneficial or detrimental depending on the situation. Indeed, goal adherence can be positively or negatively influenced by others depending on the contribution and level of involvement of those others.

2.1. Effects of Friends on Goal Attainment

Social others such as friends can be an important asset to individual goal achievement. Friends provide benefits through companionship as well as emotional and informational support (Hays 1985; Van Dierendonck 1998). Specifically, friends can offer camaraderie and can help an individual focus on her task. Relatedly, individuals tend to favor positive role models over negative ones during goal pursuit, because the former are reminders of the goals an individual desires to achieve (Lockwood et al. 2002). Indeed, studies have shown how friends can influence one's own behavior (Ajzen and Fishbein 1972; Berger 2013). For example, the presence of a friend spurs some consumers to engage in impression management that in turn drives their spending decisions (Kurt et al. 2011). People do not have to be physically present to impact an individual's goal motivations (Fitzsimmons and Bargh 2003). For instance, thinking of a close other who values one's goal has been shown to boost commitment, persistence, and performance towards the goal (Shah 2003). Friends may also influence an individual's expectancy level of success and a higher expectancy level may induce more persistence towards the goal.

Aside from the additional effort friends may inspire in an individual towards goal achievement, friends may also help prevent individuals from withdrawing effort. For example, the emotional support of friends can reduce the likelihood that individuals give up on a goal (Fitzsimmons and Bargh 2003; Shah 2003). In addition, achieving goals often requires completing intermediate tasks, which can be facilitated by others' tips and information (Berger 2013). Thus, the emotional support and useful information from friends should help an individual attain her goals.

Too many friends, however, can hinder an individual's goal achievement. This is because there are costs associated with friendships. Receiving too many tips from others can produce information overload for an individual (Bandura and Locke 2003; Freeman et al. 1987), which, in turn, can hamper goal progress. Indeed, too much information can instigate choice paralysis and lead individuals to become less decisive about their course of action (Thompson, Hamilton, and Rust 2005). As such, interacting with too many friends can become a liability and be detrimental to one's goal motivation.

Moreover, friends may demand their own emotional support and tips towards task accomplishment from an individual. Providing this support to too many others can be emotionally stressful and time consuming (Heller 1979; Weiss 1978), and thereby distract an individual from her own goal pursuit (Zhang et al. 2010). For instance, research suggests that as friendships mature, costs such as emotional aggravation and time demands increase (Hays 1985). In this sense, friendship can impede individual goal pursuit. Taken together, friends can facilitate an individual's goal achievement, but too much friending (in terms of the number of friends and level of intimacy) can hinder an individual's goal achievement. Thus:

H1: There is a nonlinear role of friending in goal achievement; positive in the linear term of friending but negative in the quadratic term of friending.

2.2. The Moderating Role of Gender

Because the benefits of friendship differ by gender, we consider the moderating role of sex. Female and male friendships vary in several respects such as closeness, intimacy, and emotional involvement. For example, females tend to prefer having more friends and more intimate relationships (Vaux 1985). It is suggested that women provide and receive more emotional support than men. As such, female friendships have been characterized as “affectively richer” than male friendships (Booth 1972).

It is expected that the positive impact of friends on an individual’s goal achievement will be stronger for females than for males. This is because female friendships tend to be more intimate and emotionally involved. Indeed, female relationships tend to be closer, more supportive, and more cooperative than male ones (Johnson 1996; Rubin 1985). As such, it is noted that females engage in more emotional exchanges while men prefer physical activities with their friends (Booth 1972). Indeed, women are expected to support the emotional needs of others and assist others in pursuit of their goals especially in close relationships and friendships (Eisenberg and Lennon 1983). For example, females were shown to be more nurturing and caring towards others than were males (Eagley and Cowley 1986). Overall, these studies suggest that females benefit more from friendships than males do. If so, the positive effect of friends on goal achievement will be greater for females than for males.

It is also likely that the negative impact of friends on an individual’s goal achievement will be stronger for females. Because women tend to be more concerned with the “overall affective quality” of their friendships (Wright 1982), they will be more involved with the emotional support and information exchange of friendships. It follows that the information overload and emotional demands that accompany friendship can be even greater for females. Consequently, females will suffer more from friendly interactions than males. Thus, the negative impact of too many friends and too intimate exchanges on goal achievement will be amplified for females. Taken together, females (versus males) will benefit more from friendships, but will suffer more from too much friending.

H2: The nonlinear role of friending in goal achievement is amplified for females versus males: friends are more beneficial to females, but are also more detrimental to females.

2.3. The Moderating Role of Experience

Because experience varies across individuals, we examine the moderating role of experience on the friendship-goal attainment link. This distinction between more experienced and novice individuals is critical because individuals will respond differently to different goal tasks. Experience may affect how an individual makes decisions, seeks assistance, and leverages knowledge and resources to achieve her goals. Indeed, research suggests that novices process information differently than more experienced individuals (Alba and Hutchinson 1987). As familiarity with a goal task increases, individuals can better decipher the most relevant information central to the task. Thus, individuals with more experience will be able to process information more efficiently than individuals with less experience.

This stream of research suggests that novices may depend more on friendship in goal pursuit than would more tenured individuals. Because novices have less experience, they respond better to positive, encouraging feedback from social others (Finkelstein and Fishbach 2012). The less experience an individual has, the more likely he may depend on friends to provide tips and information necessary for goal attainment. Following this logic, we would expect novices to benefit more from friendship in their goal pursuit.

However, individuals with less experience may be more likely to succumb to information overload and the emotional commitment of friendships in their goal pursuit. Specifically, because individuals have less experience, they will also have a harder time assessing what information is relevant to their goal

pursuit. Similarly, less experienced individuals will be more burdened by the give-and-take of emotional support and information inherent in social relationships. Taken together, individuals with less experience (versus more experience) benefits more from friendships but suffers more from too much friending. Thus:

H3: The nonlinear role of friending in goal achievement is attenuated by experience: friends are more beneficial to novices, but are also more detrimental to novices.

Consequences of Goal Attainment

Beyond helping individuals achieve their goals, firms are interested in the consequences of individual behaviors such as consumption in terms of purchase and task commitment. Prior research suggests that goal success endows individuals with a reinforced belief (from recent past experience) of self-efficacy in their ability to achieve a goal (Bandura 1988). In turn, this sense of goal achievement will reinforce an individual's desire to continue pursuing related goals, thereby increasing the effort they exert towards goal pursuit (Dreze and Nunes 2011). As such, a person will be more willing to invest in effective goal pursuit (Huang and Zhang 2011). In contrast, a failure to attain a goal can demotivate individuals and thereby discourage them from investing more effort towards a task. In other words, goal attainment will lead individuals to spend more money and time on a task. Thus,

H4: Goal attainment will increase the amount of money and time an individual spends.

3. STUDY1: FIELD STUDY ON FRIENDING AND GOAL ATTAINMENT

3.1. Data Background

Our data comes from one of the world's largest online games outside the U.S. Specifically, we examine gamers' goal achievement in the context of a Massive Multi-person Online Role Playing Game (MMORPG), whose name is concealed per our corporate partner's request. Online gaming revenues are projected to exceed \$25 billion by 2014 (eMarketer 2013). Starting from Zynga's Farmville in 2009 that helped online social games become mainstream, the number of people who play online games through social networks in the U.S. alone is projected to reach 97 million by 2017 (eMarketer 2013). Thus, social gaming and gaming markets are important for consumer behavior in general.

More specifically, online gaming provides an ideal setting of goal achievement. The act of joining the game is recognized as a gamer's commitment and willingness to pursue a goal. Overarching goals are pre-established for gamers (i.e. accomplish the game objective), and are often divided into smaller tasks (i.e. advance level by level). To begin the game, each gamer selects a character from a range of hero classes and its gender, which cannot be changed once the player begins the game. Gamers use their selected role characters to perform pre-established tasks, such as slaying dragons, destroying objects, and finding treasure throughout the game.

To achieve their goals, gamers can rely on in-game friends. Players may befriend others to seek assistance with level advancement and achieve the highest goal (i.e. win the game). Being friends allows players to communicate easily, share information and tips, and complete tasks together. Thus, the game simulates a real-world social environment in which people meet and interact with other participants via their avatars (virtual representations of themselves) while performing various tasks. Research suggests people are motivated to play online games to feel a sense of accomplishment, immerse themselves in a different world, and acquire and maintain online social relationships (Yee 2006). Online gaming provides an environment for challenges, teamwork, and social interactions (Cole and Griffiths 2007). Because many online games encourage players to befriend each other, virtual friendships may play an important role in gamers' goal achievement. For example, people may be reassured of playing worth by the presence of their online friends. In other words, gamers might not be as motivated play a game that few of their online friends regularly play. Indeed, literature on network externalities suggests the more who play a game, the more people the game will attract (Hagel and Armstrong 1997).

The digital nature of gaming enables us to precisely identify friendships and quantify the interactions among friends. The level a user reaches in the game captures all task-related accomplishments, allowing for the precise measurement of goal achievement. Real-world user demographics, such as age and race, are irrelevant in the virtual world and are likely to have minimal effects on individual goal achievement. As such, our data captures the activity of users performing all tasks throughout the game. Next, we define each variable of analysis.

3.2. Measures

Goal attainment is measured as the number of levels a gamer has achieved. In our study, players try to accomplish a total of 80 pre-determined levels. Each level represents a goal gamers must achieve in order to advance to the next level. Gamers are motivated to attain each goal because the game's storyline and goal tasks are tied to their current level. As such, they are motivated to advance in order for the storyline to continue developing. Once players have completed a level, the game system rates their task performance based on criteria such as the number of dragons slayed. Also, task difficulty increases by level to challenge gamers and continue to give them a similar or greater sense of achievement as they accomplish tasks.

Friending is measured with two alternative metrics (number and intimacy). These two variables capture both the quantity and quality of friending. We measure friend number as the amount of friends a gamer makes. When two avatars in the game agree to be friends, the system records the time stamp and the identification of each gamer. We measure intimacy as the computed score based on the interactions between the two avatars. These interactions include chatting with friends, sending gifts to friends, and teaming up with friends to accomplish tasks. The game system automatically records these interactions and computes an intimacy score. Because this score measures a dyadic friendship, we average a player's intimacy score with each of his friends and use this as the final measure of friendship intimacy.

Avatar gender is the gender a player chooses for her role the first time she joins the game. A male player may select a female avatar (but over 87% of male avatars are males according to our corporate partner's survey of its gamers). Once they begin, players cannot change their avatar gender. During play, gamers can see the image of each avatar. The avatars are designed by the company and are clearly gendered (coded as 0 for male and 1 for female in the data).

Avatar Experience is measured as tenure, the number of days that have elapsed since a player registered in the game. Tenure may influence a gamer's goal achievement since gamers who play longer usually perform better and have more chances to level up than their counterparts.

Cash spending is the total amount of real money that a player spends in the game. Although the game is free to play, players can spend real money on equipment to kill dragons and facilitate goal achievement. We used the lagged cash spending in determining goal attainment. Because this variable indicates the amount of *money* individuals spent for continuing to play the game after having achieved a specific goal, it is also the dependent variable when testing the consequence of goal attainment.

Time spent is measured as duration, or players' time spent leveling up and reaching the next goal level. As it indicates the amount of *time* individuals spent for continuing to play the game after having achieved a specific goal, it is also the dependent variable when testing the consequence of goal attainment.

Trading amount is the amount of virtual currency players can use to buy and sell second-hand items such as equipment with other players and in-game shops. Similar to cash spending, trading can influence players' goal achievement. Because gamers can use virtual money to buy and sell in the game, we code *trading-in* as the amount of virtual currency a gamer spent to purchase equipment, and *trading-out* as the amount a gamer earned from selling.

Number of deaths is the amount of times the character dies in a game. Death may motivate gamers to challenge enemies again and thus increase their interest in goal-pursuit. Yet, death may frustrate players by signaling effort futility. Thus, this variable is important to control for.

3.3. Data Analyses

Our analyses are conducted at the individual avatar level. The dataset contains 33,711 avatars with friending activities. The observation period is from December 27th 2011 to May 15th 2012. However, during this period, 755 characters' accounts were canceled by the gamer. Thus, 32,956 characters and their behaviors are available for analysis. The average goal achievement level was 23.75 ($SD = 10.42$). Gamers made 6.05 friends on average ($SD = 9.89$). The average friendship intimacy score between friends is 1,318.43 ($SD = 4,746.76$). 62.8% are male avatars. Table 1 provides descriptive statistics and correlations among the variables.

	Mean	S.D.	1	2	3	4	5	6	7	8
1 Goal attainment level	23.75	10.42	--							
2 Friend number	6.05	9.89	.691**	--						
3 Friend intimacy	1318.43	4746.76	.613**	.737**	--					
4 Gender	0.37	1.48	-.016**	-.014*	-.009	--				
5 Tenure	32.50	29.42	-.086**	-.168**	-.110**	.007	--			
6 Cash spending	1020.17	21445.72	.181**	.159**	.307**	-.004	.005	--		
7 Trade-in amount	30344.09	953665.94	.062**	.059**	.067**	.001	-.003	.038**	--	
8 Trade-out amount	88097.37	2850704.17	.092**	.085**	.134**	-.001	-.002	.161**	.436**	--
9 Number of deaths	5.25	42.42	.356**	.362**	.555**	-.005	.004	.364**	.093**	.185**

*Table 1. Descriptive Statistics and Correlation Matrix (N = 32,956 users). *p < .05, **p < .01. trade-in and trade-out amount are calculated by a virtual currency in the game that is from cash. The trading amount is not comparable to the cash spending amount and is rescaled for data anonymity concerns.*

Our model included the variables hierarchically. In Table 2, Model 1 shows the results with control variables only. Models 2-3 examine the effect of friend amount, avatar gender, and their interactive effect on goal achievement. Model 4 explores the nonlinear relationship between friend number and goal achievement, while models 5-6 test the moderating effect of avatar gender on the nonlinear relationship. Model 7 tests the moderating effect of tenure on friend amount. Model 8 explores the moderating effect of tenure on the nonlinear relationship between friend number and goal achievement. Model 9 presents the moderating role of avatar gender and tenure on the relationship between friend number and goal achievement. While Models 2 to 9 use the quantity dimension of friending (number of friends), Models 10 to 17 use the quality dimension (friend intimacy).

We mean-centered all continuous variables to minimize the threat of multicollinearity in equations with squared terms and interaction terms. We also calculated the variance inflation factor ($VIF \leq 10$) to gauge multicollinearity (Neter et al. 1990). In the models the VIF scores are between 1.00 and 8.93, indicating no serious threat of multicollinearity. The outcomes of the Durbin-Watson statistic ranged from between 1.85 and 1.88 in the models, demonstrating that serial correlation is not a serious concern.

Variable	M1	M2	M3	M4	M5	M6	M7	M8
Cash spending	.059***	.038***	.039***	.047***	.047***	.047***	.038***	.046***
Trade-in amount	.024***	.010**	.010**	.013***	.013***	.013***	.009**	.013***
Trade-out amount	.010*	.006	.006	.005	.005	.005	.006	.005
# of deaths	.330***	.104***	.106***	.153***	.153***	.153***	.102***	.152***
Gender		-.003	-.002		.000	-.003		
Tenure		.023***					.030***	.035***
Friend Number (#)		.650***	.646***	1.082***	1.082***	1.082***	.665***	1.111***

Gender*Friend#			.011***		.010***	.009**		
Tenure*Friend#							-.029***	-.107***
Friend # ²				-.494***	-.494***	-.498***		-.545***
Gender*Friend# ²						.007		
Tenure*Friend# ²								.136***
Model Significance	.001	.001	.001	.001	.001	.001	.001	.001
Durbin-Watson	1.87	1.87	1.87	1.85	1.85	1.85	1.87	1.85
VIF	1.00-1.28	1.00-1.32	1.00-1.32	1.04-6.04	1.04-6.04	1.00-6.58	1.12-1.56	1.12-6.92
R ²	.131	.493	.492	.533	.533	.533	.493	.537
Adjusted R ²	.131	.493	.492	.533	.533	.533	.493	.536
Variable	M9	M10	M11	M12	M13	M14	M15	M16
Cash spending	.013***	.012**	.047***	.048***	.046***	.017***	.046***	.045***
Trade-in amount	.020***	.020***	.007	.007	.008*	.019***	.004	.005
Trade-out amount	.001	.001	.012***	.012***	.012***	.001	.017***	.017***
# of deaths	.027***	.027***	.093***	.094***	.093***	.014***	.087***	.088***
Gender	-.011***							
Tenure	.020***							
Friend Intimacy	.599***	.600***	1.005***	1.005***	1.016***	.671***	1.087***	1.093***
Gender*Friend Int.		.017***		.012***	.062***			.051***
Tenure*Friend Int.						-.099***	-.136***	-.131***
Friend Int ²			-.549***	-.549***	-.565***		-.670***	-.675***
Gender*Friend Int ²						-.061***		
Tenure*Friend Int. ²								.172***
Model Significance	.001	.001	.001	.001	.001	.001	.001	.001
Durbin-Watson	1.88	1.88	1.88	1.88	1.88	1.88	1.88	1.88
VIF	1.00-1.56	1.00-1.56	1.02-3.74	1.00-3.72	1.00-3.98	1.07-2.44	1.07-7.97	1.00-8.00
R ²	.377	.378	.458	.458	.459	.383	.462	.463
Adjusted R ²	.377	.378	.458	.458	.459	.383	.462	.463

Table 2. *Effect of Friend Amount, Intimacy, Gender, and Tenure on Individual Goal Attainment.*

* $p < .10$, ** $p < .05$, *** $p < .01$; VIF = Variance Inflation Factor

H1 predicted a nonlinear role of friending (number and intimacy) in goal achievement. As shown in Models 2 and 10, the coefficients of friend number and intimacy are positive ($b = .650 / .599$, $p < .01$). Models 4 and 12 show that the coefficients of the friend number *squared* and intimacy *squared* are negative ($b = -.494 / -.549$, $p < .01$). Thus, H1 is supported.

H2 predicted that the nonlinear role of friendship in goal achievement would be amplified for females. Model 14 shows a positive linear interaction between friend intimacy and gender ($b = .062$, $p < .01$), and a negative interaction between friend intimacy *squared* and gender ($b = -.061$, $p < .01$). These results indicate that the nonlinear relationship is stronger for female avatars versus male avatars in terms of friend intimacy. However, the interaction between friend number *squared* and gender is not significant ($p > .10$). Thus, H2 is partially supported only for friend intimacy but not for friend number.

H3 predicted that the nonlinear role of friendship in goal achievement would be attenuated by avatar experience. As Model 8 shows, there is a negative interaction between tenure and friend number ($b = -.106$, $p < .01$) and as Model 16 shows, there is a negative interaction between tenure and friend intimacy ($b = -.136$, $p < .01$). Also, Model 8 shows that the interaction between friend number *squared* and tenure is positive ($b = .136$, $p < .01$), and Model 16 shows the interaction between intimacy *squared* and tenure is positive ($b = .172$, $p < .01$). These results suggest that the nonlinear role of friending in goal achievement is attenuated by avatar experience, i.e. amplified for novices and weakened for more experienced gamers. Thus, H3 is supported in our data.

H4 predicted that goal attainment will positively affect the amount of money and time individuals spend. In order to account for the correlated error terms between the equation determining goal attainment and the equation determining individual consumption and to improve the statistical estimation efficiency, we run a model using seemingly unrelated regression (SUR). SUR can simultaneously estimate the role of friending and goal attainment and the role of goal attainment on consumption (money and time). As Models 2 and 5 of Table 3 show, there is a positive interaction between goal attainment ($b = 87.087$, $p < .01$) and spending ($b = 105.444$, $p < .01$), and as Models 3 and 6 show, there is a positive interaction between goal attainment ($b = 2.121$, $p < .01$) and time ($b = 2.188$, $p < .01$). Thus, H4 is supported.

Variable	M1 DV=Goal Attainment	M2 DV= Consumption	M3 DV=Duration	M4 DV=Level	M5 DV= Consumption	M6 DV=Duration
Control						
Trade-in amount	.001(.001)***	-.001(.001)***	.001(.001)***	.001(.001)	-.001(.001)***	.001(.001)***
Trade-out amount	.001(.001)**	.001(.001)***	-.001(.001)**	.001(.001)***	.001(.001)***	-.001(.001)**
Number of deaths	.041(.001)***	168.024(2.798)***	.058(.003)***	.024(.001)***	166.437(2.798)***	.053(.003)***
Gender	-.076(.085)	-233.349(227.092)	4.142(.274)***	-.123(.089)	-224.353(227.092)	4.174(.274)***
Tenure	.010(.001)***			.005(.001)***		
Goal attainment		87.087(11.244)***	2.121(.014)***		105.444(11.246)***	2.188(.0136)***
Friend number	1.163(.010)***					
Gender * Friend number	.149(.070)**					
Tenure*Friend number	-.005(.001)***					
Friend number	-.019(.001)***					
Gender * Friend number ²	.001(.001)					
Tenure * Friend number ²	.001(.001)***					
Friend intimacy				.002(.001)***		
Gender * Friend intimacy				.705(.132)***		
Tenure * Friend intimacy				-		
Friend intimacy ²				.001(.001)***		
Gender ×Friend intimacy ²				-.001(.001)***		
Tenure *Friend intimacy ²				-.001(.001)***		
Total observations	32,956	32,956	32,956	32,956	32,956	32,956
Model Significance	0.001	0.001	0.001	0.001	0.001	0.001
χ^2	38400.80	5582.65	31015.34	24694.22	5610.59	32647.31
R ²	.537	.146	.468	.465	.146	.467

Table 3. Consequences of Goal Attainment. * $p < .10$, ** $p < .05$, *** $p < .01$; Consumption is in-game cash spending amount. Duration is the time spent for gaming.

4. STUDY2: SURVEY OF THE UNDERLYING MECHANISMS OF FRIENDSHIP EFFECTS ON GOAL ATTAINMENT

To better understand the mechanisms underlying the effects of friendship on goal achievement, we conducted a follow-up survey. Per our hypotheses, we posit that friends provide information and emotional support that can promote goal attainment. However, too many friends can hurt goal completion due to information overload and time demands.

Based on theoretical logic, we consider the following constructs. For our dependent variables, we employ *game efficacy*, adapted from Novak et al. (1998), to capture individuals' confidence to play the game well, and *goal impediment*, adapted from Speck and Elliott (1997), to capture perceived hindrance from goal completion. The former (game efficacy) constitutes a positive outcome of having friends that motivates individuals' goal pursuit, and may be enhanced by the *information support*, adapted from Zimet et al. (1988), and *emotional support*, adapted from Zimet et al. (1988). The latter (perceived goal impediment) represents a negative outcome resulting from having too many friends that deters goal completion, and may be exacerbated by a feeling of *information overload*, adapted from Jacoby et al. (1984), and negative emotions (e.g., anxiety) arising from *emotional commitment*, adapted from Hirschfeld (1977). Also, we controlled for individuals' demographics (*age, gender, education, and income*) and *playing duration*.

For the analysis involving goal impediment as the dependent variable, we also controlled for *personal intolerance towards interference*, as people with a low tolerance may more easily feel impeded in their goal pursuit when dealing with interferences from others, adapted from Lowe and Corkindal (1998). Figure 1 depicts the conceptual model of the relationships tested.

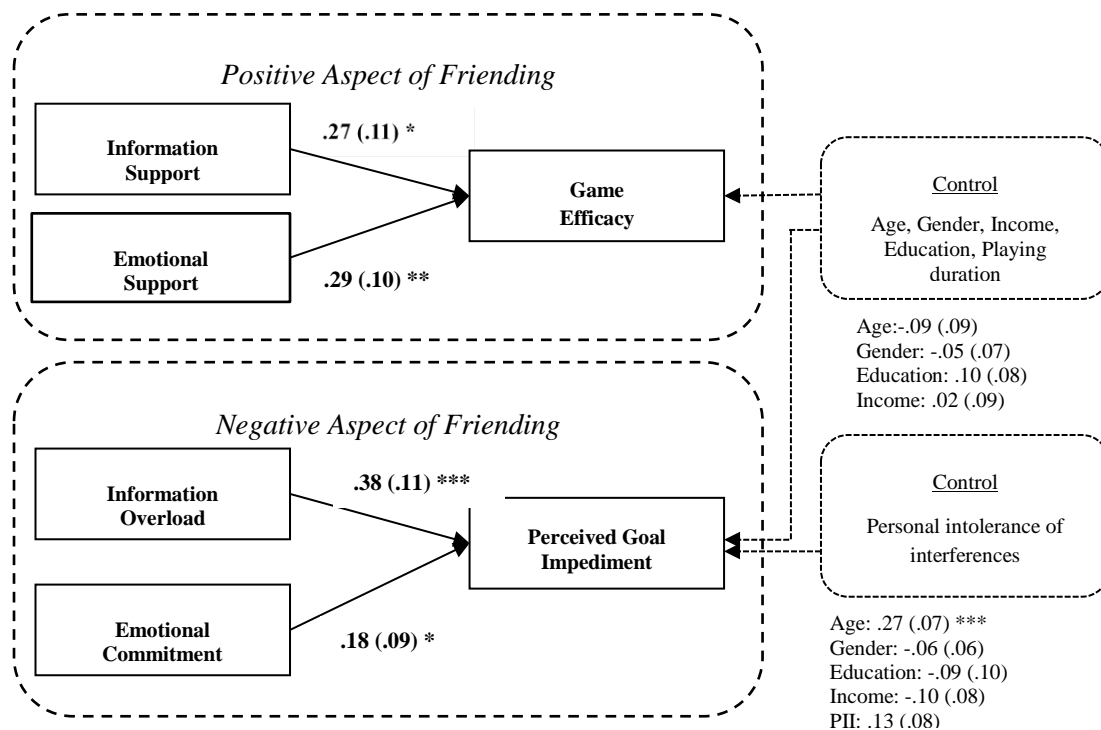


Figure 1. Conceptual Model of the Relationships Assessed in Survey Study. The bracket indicates standard errors. $*p \leq .05$, $**p \leq .01$, $***p \leq .001$. Significant relationships are in bold

4.1. Survey Administration

Our follow-up survey data was conducted with the support of a market research firm. The firm sent e-mails to a pre-selected sample of gamers. Of the 172 e-mail responses obtained, 13 were incomplete, leaving a final set of 159 responses. In addition to the perceptual measures (game efficacy, perceived goal impediment, information support, emotional support, information overload, emotional commitment, personal intolerance to interference), we elicited respondents' demographics (age, gender, income, education), their playing duration, game level attained, and number of in-game friends. While the survey method does not lend itself to accurate measurements of players' state of game-play such as their level attained and number of friends compared with log data, we nevertheless included these measures for

validation purposes. Indeed, the results from a regression analysis of these measures (with game level attained as the dependent variable, and number of friends and its squared-term as independent variables) support the log data analysis: number of friends has a positive relationship with game level attained ($t = 3.954, p \leq .001$), while its squared-term has a negative relationship with game level attained ($t = -2.607, p \leq .01$). The results are robust after controlling for respondents' playing duration and their demographics (with duration having a significant positive effect, ($t = 2.853, p \leq .01$), and age a significant negative effect, ($t = -2.109, p \leq .05$); the VIF ranged from 1.152 to 3.148. Next, we report the survey results.

4.2. Survey Results

We employed structural equation modeling (SEM) to analyze the data. We first assessed the measurement model followed by the structural model. The analysis of the measurement model indicates satisfactory reliability and convergent validity levels of the constructs i.e., Cronbach's Alpha (CA) $> .70$ and Composite Reliability (CR) $> .70$. The discriminant validity was assessed by comparing the square-root of AVE of each construct against its correlations with other constructs (MacKenzie et al. 2011). The results show that the diagonal elements (square-root of AVE) exceed other entries in the same row or column, satisfying the discriminant validity requirement. In addition, as the correlation between information support and emotional support is quite high (.68), we assessed whether multicollinearity could be a threat to our results. Our assessments indicate that multicollinearity is unlikely to be a threat, since the highest VIF score is 1.879, well below the threshold of 10. Given that the measurement model is acceptable.

The results show that both informational support and emotional support significantly promote game efficacy i.e., players' confidence to play the game well. On the other hand, perceived goal impediment is exacerbated by a feeling of information overload and negative emotions associated with emotional commitment (e.g., feeling anxious or uneasy when gaming friends are not online). These results are consistent with our expectations, and provide further support for our hypothesis arguments.

5. DISCUSSIONS

This study provides initial evidence for the role of friendships in individual goal attainment. Friends serve as positive influences that motivate, support, and provide useful knowledge towards goal achievement. However, too much friending can become detrimental to goal pursuit by creating information overload and demanding emotional commitment. The nonlinear effect is further strengthened for females and novices. The results enhance our knowledge and understanding of the relationship between friendship and goal attainment.

This research offers several theoretical contributions. First, the results extend the social influence and goal attainment literature by exploring the role of friendship in goal achievement. To our knowledge, this is one of the first studies that explicitly investigates this phenomenon. Prior studies show how self-efficacy (Bandura 1988), motivation (Deci and Ryan 2000), and implementation intentions (Gollwitzer 1999) impact goal pursuit. We find that social influence can also play a pivotal role in the attainment of one's goals.

Second, the nonlinear relationship between friendship and goal achievement contributes to understanding on the nature of social influence. Research suggests that friends bear both benefits and costs (Grayson 2007; Price and Arnould 1999). Our findings extend this notion of friends as assets and liabilities. We also advance the distinction of friendship quantity and intimacy: not only the number of friends, but also friendship intimacy matters to goal pursuit.

This research also advances knowledge on the role of gender. Female friendships have long been known to differ in characteristics from male friendships (Eagly and Cowley 1986; Hays 1985; Wright 1982). We find that female friendships are more beneficial to the achievement of a goal, but that too much friending can ultimately hinder goal attainment, especially for female avatars. The moderating role that

gender plays is an important contribution to the online gaming and Information Systems (IS) literature. Although these literatures shed light on the role that (avatar) gender plays in online gaming and virtual communities (Kim et al. 2012; Yee et al. 2011), there is a dearth of research on the role of social influence in female versus male (avatar) goal pursuit and level advancement. The findings address this gap and suggest a strengthened nonlinear role of friending in goal attainment for females.

Lastly, our findings contribute to the literature by identifying the boundary conditions of experience level. Individuals with less experience may benefit more from social interactions, but may also suffer more from information overload and emotional commitment. Our results add to the burgeoning literature on the differences between more experienced and novice individuals in the virtual and social gaming world. In addition, our findings proffer strategic insights towards creating customized experiences by player segment based on their response to game designs.

In conclusion, this research aims to provide evidence for the role of friends in goal attainment. We hope this study spurs future research on how social others influence individual goal pursuits.

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