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Friend Networking Sites and their Relationship to Adolescents'  
Well-being and Social Self-Esteem

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### Abstract

The aim of this study was to investigate the consequences of friend networking sites (e.g., Friendster, MySpace) for adolescents' self-esteem and well-being. We conducted a survey among 881 adolescents (10- to 19-year-olds) who had an online profile on a Dutch friend networking site. Using structural equation modeling, we found that the frequency with which adolescents used the site had an indirect effect on their social self-esteem and well-being. The use of the friend networking site stimulated the number of relationships formed on the site, the frequency with which adolescents received feedback on their profiles, and the tone (i.e., positive vs. negative) of this feedback. Positive feedback on the profiles enhanced adolescents' social self-esteem and well-being, whereas negative feedback decreased their self-esteem and well-being.

Keywords: Internet; Friend networking sites; Friendster; MySpace; Self-esteem; Social self-esteem; Well-being.

## Friend Networking Sites and their Relationship to Adolescents'

### Well-being and Social Self-Esteem

The opportunities for adolescents to form and maintain relationships on the Internet have multiplied in the past few years. Particularly social networking sites have rapidly gained prominence as venues to relationship formation. Social networking sites vary in the types of relationships they focus on. There are dating sites, such as Match.com, whose primary aim is to help people find a partner. There are common interest networking sites, such as Bookcrossing.com, whose aim is to bring people with similar interests together. And there are friend networking sites, such as Friendster and MySpace, whose primary aim is to encourage members to establish and maintain a network of friends.

The goal of this study is to investigate the consequences of friend networking sites for adolescents' social self-esteem and well-being. Given the recent worldwide proliferation of such sites and the ever-expanding numbers of adolescents joining up, these sites presumably play an integral role in adolescent life. Friend networking sites are usually open or semi-open systems. Everyone is welcome to join, but new members have to register, and sometimes the sites only allow members if they are invited by existing members. Members of the sites present themselves to others through an online profile, which contains self-descriptions (e.g., demographics, interests) and one or more pictures. Members organize their contacts by giving and receiving feedback on one another's profiles.

Although friend networking sites have become tremendously popular among adolescents, there is as yet no research that specifically focuses on the uses and consequences of such sites. This is remarkable because friend networking sites lend themselves exceptionally well to the investigation of the social consequences of Internet communication. After all, peer acceptance and interpersonal feedback on the self, both important features of

friend network sites, are vital predictors of social self-esteem and well-being in adolescence<sup>1</sup>. Therefore, if the Internet has the potential to influence adolescents' social self-esteem and well-being, it is likely to occur via their use of friend networking sites.

There is no period in which evaluations regarding the self are so likely to affect self-esteem and well-being as in adolescence<sup>1</sup>. Especially early and middle adolescence is characterized by an increased focus on the self. Adolescents often engage in what has been referred to as imaginative audience behavior<sup>2</sup>: They tend to overestimate the extent to which others are watching and evaluating, and, as a result, can be extremely preoccupied with how they appear in the eyes of others. On friend networking sites, interpersonal feedback is often publicly available to all other members of the site. Such public evaluations are particularly likely to affect the development of adolescents' social self-esteem<sup>1</sup>. In this study, social self-esteem is defined as adolescents' evaluation of their self-worth or satisfaction with three dimensions of their selves: physical appearance, romantic attractiveness, and the ability to form and maintain close friendships. Well-being refers to a judgment of one's satisfaction with life as a whole.<sup>3</sup>

Our study is conducted in the Netherlands where, since April 2000, a friend networking site exists that is primarily used by adolescents. In May 2006, this website, named CU2 ("See You Too"), contained 415,000 profiles of 10- to 19-year-olds. Considering that the Netherlands counts about 1.9 million adolescents in this age group, approximately 22% of Dutch adolescents use this website to form and maintain their social network.

#### *Internet Use, Well-being, and Self-esteem*

Ever since Internet use became common as a leisure activity, researchers have been interested in investigating its consequences for well-being and self-esteem. For both well-being and self-esteem, the literature has yielded mixed results: Some studies reported negative

relationships with various types of Internet use<sup>4,5</sup>, other studies found positive relationships<sup>6</sup>, and yet other studies found no significant relationships<sup>7,8</sup>.

Two reasons may account for the inconsistent findings on the relationships between Internet use, self-esteem, and well-being. First, many studies have treated the independent variable 'Internet use' as a one-dimensional construct. Some studies did investigate the differential effects of types of Internet use, but the selection of these types usually did not follow from a theoretical anticipation of their consequences for self-esteem and well-being. In our view, at least a distinction between social and non-social Internet use is required to adequately investigate Internet effects on self-esteem and well-being. We believe that social self-esteem and well-being are more likely to be affected if the Internet is used for communication than for information seeking. After all, feedback on the self and peer involvement, both important precursors of self-esteem and well-being, are more likely to occur during online communication than during online information seeking.

A second shortcoming in earlier studies is that many authors did not specify *how* Internet use could be related to self-esteem and well-being. Most research has focused on main effects of Internet use on *either* self-esteem *or* well-being. None of these studies have considered models in which the influence of Internet use on self-esteem and well-being is considered simultaneously. By modeling the relationships of Internet use with both self-esteem and well-being, a more comprehensive set of hypotheses can be evaluated, which may clarify some of the contradictory findings in previous studies.

#### *Our Research Hypotheses Modeled*

It has repeatedly been shown that adolescents' self-esteem is strongly related to their well-being. Although the literature has not clearly established causation, most self-esteem theorists believe that self-esteem is the cause and well-being the effect<sup>9</sup>. Based on these

theories, we hypothesize that social self-esteem will predict well-being, and by doing so, it may act as a mediator between the use of friend networking sites and well-being. After all, if the goal of friend networking sites is to encourage participants to form relationships and to comment on one another's appearance and personality, it is likely that the use of such sites will affect the dimensions of self-esteem that are related to these activities. The hypothesis that adolescents' social self-esteem predicts their well-being is modeled in Figure 1 by means of path H1.

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We also hypothesize that the use of friend networking sites will increase the chance that adolescents (a) form relationships on this site (path H2a), and (b) receive reactions on their profiles (path H3a). After all, if the aim of using friend networking sites is to meet new people and to give and receive feedback, it is plausible that the more these sites are used, the more friends and feedback a member gets. As Figure 1 shows, we do not hypothesize that the use of friend networking sites will directly influence the tone of reactions to the profiles because the mere use of such a site cannot be assumed to influence the tone of reactions to the profiles. However, we do hypothesize an indirect relationship between use of friend network sites and the tone of the reactions via the *frequency* of reactions that adolescents receive (path H3a and H5). In a recent study on the use of dating sites, members of the site often modified their profile based on the feedback they received. By means of a process of trial and error, they were able to optimize their profile, and, by doing so, optimize the feedback they received<sup>10</sup>. We therefore assume that the more reactions adolescents receive to their profiles, the more

positive these reactions will become (path H5). We also assume that the more reactions adolescents receive the more relationships they will form (path H6).

We not only assume that adolescents' social self-esteem mediates the relationship between the use of friend networking sites and their well-being; we also hypothesize that the relationships between the use of friend networking sites and adolescents' social self-esteem will be mediated by three types of reinforcement processes that are common on friend network sites and that have been shown to affect adolescents' social self-esteem<sup>1</sup>. These reinforcement processes are: (a) the number of relationships formed through the friend network site, (b) the frequency of feedback that adolescents receive on their profiles (e.g., on their appearance and self-descriptions), and (c) the tone (i.e., positive vs. negative) of this feedback. Our hypotheses about these mediated influences are modeled by means of path H2a-b, H3a-b, and H4 in figure 1.

We expect that for most adolescents the use of friend networking sites will be positively related to their social self-esteem. We base this view on theories on self-esteem, which assume that human beings have a universal desire to protect and enhance their self-esteem<sup>11</sup>. Following these theories, we believe that adolescents would avoid friend networking sites if these sites were to negatively impact their social self-esteem. Friend networking sites provide adolescents with more opportunities than face-to-face situations to enhance their social self-esteem. These sites provide a great deal of freedom to choose interactions. In comparison to face-to-face situations, participants can usually more easily eliminate undesirable encounters or feedback and focus entirely on the positive experiences, thereby enhancing their social self-esteem.

However, if, by contrast, an adolescent for any reason is mostly involved in negative interactions on these sites, an adverse influence on his or her social self-esteem seems

plausible. Especially because reactions to the profiles are made public to other members of the site, negative reactions are likely to have a negative influence on adolescents' social self-esteem. We therefore hypothesize that a positive tone of reactions will positively predict social self-esteem, whereas a negative tone will negatively predict social self-esteem.

## Method

### *Sample and Procedure*

We conducted an online survey among 881 Dutch adolescents between 10 and 19 years of age who had a profile on the friend networking site CU2 ("See You Too"); 45% were boys and 55% were girls ( $M$  age = 14.8;  $SD$  = 2.7). A profile on CU2 includes demographic information, a description of the user and his or her interests, and one or more pictures. Reactions of other CU2 users to the profiles are listed at the bottom of each profile (for more information, see [www.cu2.nl](http://www.cu2.nl)).

Upon accessing their profile, members of the site received a pop-up screen with an invitation to participate in an online survey. The pop-up screen stated that the University of Amsterdam conducted the survey in collaboration with CU2. The adolescents were informed that their participation would be voluntary, that they could stop with the questionnaire whenever they wished, and that their responses would be anonymous.

### *Measures*

*Use of friend networking site.* We used three items measuring the frequency, rate, and intensity of the use of the friend networking site: (a) "How many days per week do you usually visit the CU2 site?" (b) "On a typical day, how many times do you visit the CU2 site?" and (c) "If you visit CU2, how long do you usually stay on the site?" The first two items required open-ended responses. Response categories for the third item ranged from 1 (*about 10 min*) to 7 (*more than an hour*). Responses to the three items were standardized. The



standardized items resulted in a Cronbach's alpha of .61.

*Frequency of reactions to profiles.* The number of reactions to the profiles was measured by two items: "How often do you get reactions to your profile from unknown persons," and "How often do you get reactions to your profile from people you only know through the Internet?" Response categories to the items ranged from 1 (*never*) to 5 (*very often*). Responses to these two items were averaged, and resulted in a Cronbach's alpha of .72

*Tone of reactions to profiles.* The tone of the reactions to the profiles was measured with the following two questions: "The reactions that I receive on my profile are...." and "The reactions that I receive on what I tell about my friends are ...." Response categories ranged from 1 (*always negative*) to 5 (*always positive*). Cronbach's alpha was .87.

*Relationships established through CU2.* We asked respondents how often they had established (a) a friendship and (b) a romantic relationship through CU2. Response options were 0 (*never*), 1 (*once*), and 2 (*more than once*). The correlation between the two items was  $r = .34$ .

*Social self-esteem.* We used three subscales of Harters' self-perception profile for adolescents<sup>12</sup>: the physical appearance subscale, the close friendship subscale, and the romantic appeal subscale. From each subscale we selected the four items with the highest factor loadings. Response categories for the items ranged from 1 (*agree entirely*) to 5 (*disagree entirely*). Cronbach's alpha values were .91 for physical appearance scale, .85 for the close friendship scale, and .81 for the romantic appeal scale.

*Well-being.* We used the five-item satisfaction with life scale developed by Diener et al.<sup>3</sup> Response categories ranged from 1 (*agree entirely*) to 5 (*disagree entirely*). Cronbach's alpha for the scale was .89.

## Results

### *Descriptive Statistics*

Adolescents visited the friend networking site on average three days a week ( $M = 3.09$ ,  $SD = 2.07$ ). When they visited the website, they stayed on the site for approximately a half hour. The average number of reactions that adolescents had received on their profiles was 25.31 ( $SD = 50.00$ ), with a range from 0 to 350 reactions. The tone of the reactions varied significantly among adolescents. Of the adolescent who reported having received reactions to their profiles ( $n = 592$ ), 5.6% indicated that these reactions had always been negative; 1.6% that they had predominantly been negative; 10.1% that they had sometimes been negative and sometimes positive; 49.3% that they had been predominantly positive; and 28.4% that they had always been positive. Thirty-five percent of the adolescents reported having established a friendship, and 8.4% reported having formed a romantic relationship through the friend networking site.

### *Zero-order Correlations*

Before testing our hypothesized model, we present a matrix showing the Pearson product-moment correlations between the variables included in the model (see Table 1).

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### *Testing the Hypothesized Model*

The hypotheses in our study were investigated with the Structural Equation Modeling software AMOS 5.0<sup>13</sup>. The variables in our model were all modeled as latent constructs. The construct reflecting the use of the friend networking site was measured by 3 items, and well-being by 5 items. The frequency of reactions to profiles, the tone of the reactions to profiles,

and the number of relationships established by the site were each measured by 2 items. The latent construct social self-esteem was formed by the three subscales measuring physical appearance self-esteem, close friendship self-esteem, and romantic appeal self-esteem. For reasons of clarity, we do not present the measurement model (i.e., the factor-analytic models) in our graphical presentation of the results. However, all factor-analytic models led to adequate descriptions of the data. The factor loadings were all above .44.

To investigate our hypotheses, we proceeded in two steps. First, we tested whether the hypothesized model in Figure 1 fit the data. Then, we checked whether we could improve the model's fit by adding or removing theoretically meaningful paths from the hypothesized model. We used three indices to evaluate the fit of our models: the  $\chi^2/df$  ratio, the comparative fit index (CFI), and the root mean square error of approximation (RMSEA). An acceptable model fit is expressed in a  $\chi^2/df$  ratio of less than 3.0, and a CFI value greater than .95, and a RMSEA value less than .06<sup>14,15</sup>.

Our hypothesized model fit the data satisfactorily well,  $\chi^2/df$  ratio = 2.5; CFI = .96; RMSEA = .05. However, the results indicated that two paths assumed in our hypothesized model were not significant: path H2b from the number of relationships formed on the friend networking site to self-esteem, and path H3b from the frequency of reactions to the profile to self-esteem.

After removal of the two nonsignificant paths, we subjected our model to a final test. The modified model fit the data well,  $\chi^2/df$  ratio = 2.5; CFI = .98, RMSEA = .05. We therefore accepted the model as an adequate description of the data. Our final model indicates that all of our research hypotheses (i.e., those visualized by paths H1, H2a, H3a, H4, H5, and H6) were confirmed by the data. Figure 2 visualizes the observed final model. The reported coefficients are standardized betas.

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### *The Model Controlled for Age and Gender*

To test whether our final model also holds when age and gender are controlled for, we tested a model in which we allowed paths between age and gender and all of the remaining independent, mediating, and dependent variables in the model. This model again led to a satisfactory fit,  $\chi^2/df$  ratio = 2.6; CFI = .95; RMSEA = .05.

### Discussion

Our study was the first to show the consequences of adolescents' use of friend networking sites for their social self-esteem and well-being. Adolescents' self-esteem was affected solely by the tone of the feedback that adolescents received on their profiles: Positive feedback enhanced adolescents' self-esteem, and negative feedback decreased their self-esteem. Most adolescents (78%) always or predominantly received positive feedback on their profiles. For these adolescents, the use of friend networking sites may be an effective vehicle for enhancing their self-esteem.

However, a small percentage of adolescents (7%) did predominantly or always receive negative feedback on their profiles. For those adolescents, the use of friend networking sites resulted in aversive effects on their self-esteem. Follow-up research should attempt to profile these adolescents. Earlier research suggests that users of social networking sites are quite able to learn how to optimize their self-presentation through their profiles<sup>10</sup>. Adolescents who predominantly receive negative feedback on their profiles may especially be in need of mediation on how to optimize their online self-presentation.

No less than 35% of the respondents reported having established one or more friendships through the site, and 8% one or more romantic relationships. However, as discussed, the number of friendships and romantic relationship formed via the site did not affect adolescents' social self-esteem. Obviously, it is not the sheer number of relationships formed on the site that affect adolescents' social self-esteem. Research on adolescent friendships suggests that the quality of friendships and romantic relationships may be a stronger predictor of social adjustment than the sheer number of such relationships<sup>16</sup>. Therefore, future research on friend networking sites should include measures on the quality of the relationships formed through friend networking sites.

Our study focused on a new and pervasive phenomenon among adolescents: friend networking sites. In the Netherlands, about one quarter of adolescents is currently a member of one or more of such sites. The Netherlands is at present at the forefront of Internet-based communication technologies (e.g., 96% of Dutch 10- to 19-year olds have home access to the Internet, and 90% use Instant Messaging). Therefore, it is a unique spot to start investigating the social consequences of such technologies. However, friend networking sites are a worldwide phenomenon that attracts ever younger adolescents. Such sites can no longer be ignored, neither by communication researchers nor by educators.

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Table 1.

## Pearson Product-Moment Correlations

Variables	1	2	3	4	5	6	7	8
1. Use of friend networking site								
2. Frequency of reactions to profiles	.16***							
3. Tone of reactions to profiles	.10*	.24***						
4. Close friends established via site	.18***	.31***	.01					
5. Romantic relations established via site	.12***	.12***	-.13**	.34***				
6. Physical appearance self-esteem	.04	.05	.29***	-.00	-.00			
7. Close friendship self-esteem	.12***	.13***	.40***	.06	-.05	.61***		
8. Romantic attractiveness self-esteem	.06	.16***	.38***	.08*	-.00	.68***	.72***	
9. Well-being	.06	.07*	.37***	-.03	-.01	.59***	.54***	.45***

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



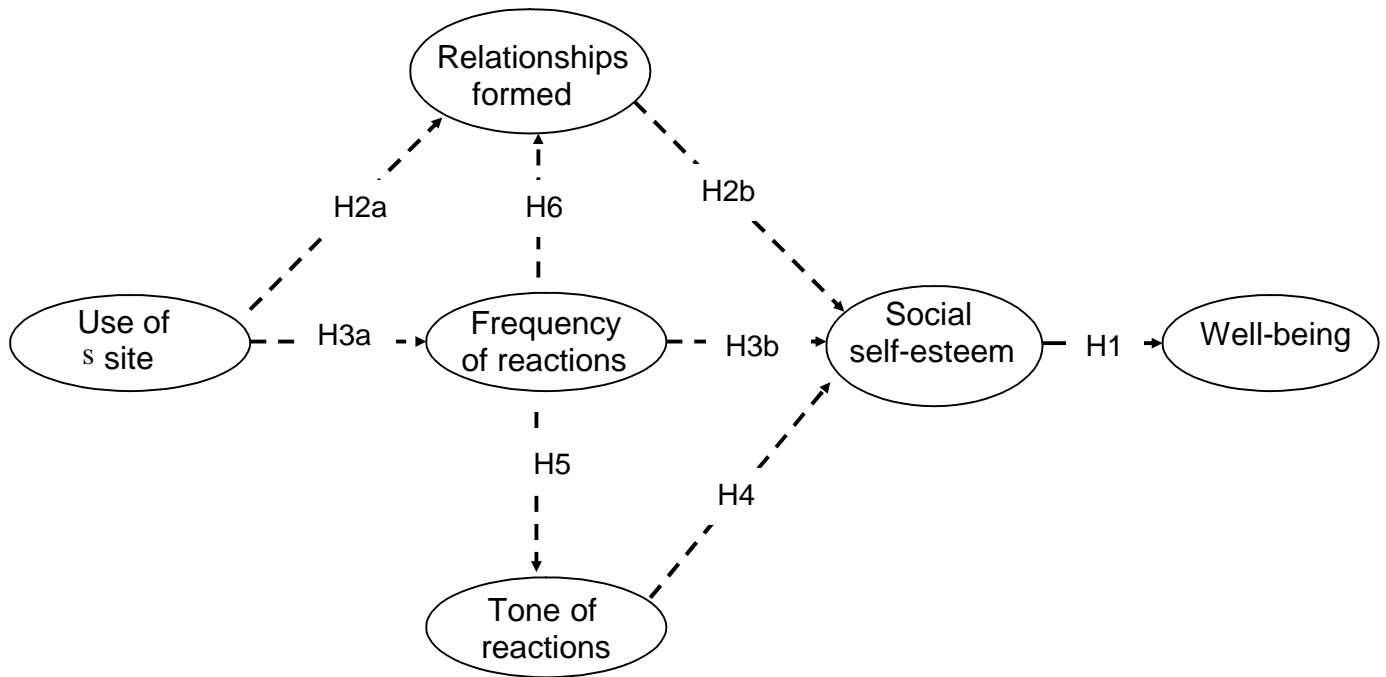


Figure 1.

Hypothesized model on the relationships among use of friend networking site, social self-esteem, and well-being

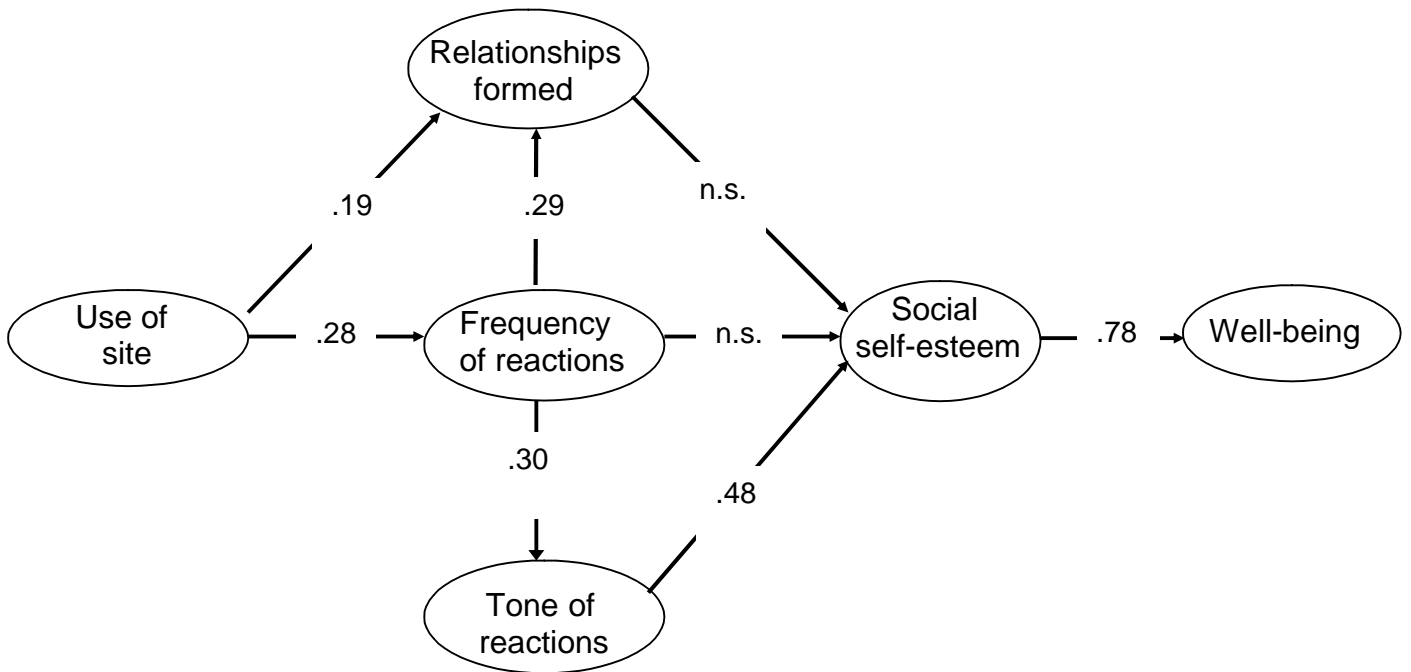


Figure 2.

Structural equations model of the relationships among use of friend networking site, social self-esteem, and well-being. The ellipses represent latent constructs estimated from at least two observed variables; coefficients represent standardized betas significant at least at  $p < .01$