

Masterthesis

The influence of adolescents'
psychosocial wellbeing and internet-
specific parenting on meeting online
contacts in real life

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Abstract

The main purpose of this longitudinal study was to investigate the relationship between adolescents' psychosocial wellbeing and internet-specific parenting on meeting online contacts IRL. Information was collected amongst adolescents who participated in the Monitor Internet and Youth of the Addiction Research Institute (IVO, The Netherlands): 5237 adolescents in 2007, 5403 adolescents in 2008 and 2416 adolescents participated in both surveys. Both cross-sectional and longitudinal analyses were performed. The results show that low self-esteem and low feelings of loneliness predict a larger chance to meet online contacts IRL a year later. For depression and social anxiety only cross-sectional relations were found, indicating that depressed feelings are related to a larger chance to meet online contacts IRL, but that this is no causal relationship. In addition, negative longitudinal relations were found between parental rules about the content of internet use, parental monitoring and the quality of communication about internet use on meeting online contacts IRL a year later. Cross-sectionally, positive relations were found between the parental rules about the duration of internet use and the frequency of the communication about internet use. Overall, when parents want to prevent their children from meeting online contacts IRL, it would be wise to impose strict rules about the content of their children's internet use, to monitor their internet use and to have high quality communication about it.

Introduction

Research shows that 99% of the Dutch youth had internet access at home in 2008. On average, they spent 8.2 hours a week communicating through instant messenger (Van Rooij et al., 2008). Adolescents thus have the opportunity to make new friends through instant messenger functions, chatrooms and network websites. When adolescents communicate with someone they have met online, there is a chance that they want to meet this person face to face someday.

In the past years, many media reports appeared on this topic. Like a bulletin in the Dutch papers in November 2007: "Man beaten for hours after internet date" (ANP, 2007). Another incident happened to a fifty year old man from Kampen. He was stabbed to death by a 28 year old woman he had met online (Novum, 2007). In July 2007, a Dutch news website reported that almost half of the pregnant teenagers in Shanghai had met their partner through the internet, but most of these partners disappeared after they heard about this pregnancy (Verhagen, 2007). These kinds of reports in the media suggest that meeting someone in real life (IRL) that one only knows from online contacts could be dangerous. However, reports on adolescents for whom a meeting with online contacts IRL was a nice experience do not make the news. This might possibly give the false impression that meeting someone you only know online is dangerous.

Research from Wolak, Mitchell and Finkelhor (2002) though, shows that there are differences in the type of contacts between adolescents who actually date someone they know through the internet and adolescents who do not. For instance when adolescents date someone, most of the time there is contact over the phone in addition to online contact before the actual meeting takes place, the person is often introduced by a close friend or

relative and the one with whom the date is arranged most of the time lives within one hour travel-distance (Wolak, Mitchel & Finkelhor, 2002).

With regard to this topic, it is important to know how many and which adolescents actually have such meetings IRL, how many parents are aware of it and how often it happens that the person one meets has been lying about his or her identity. Another question that arises is whether the adolescents' psychosocial wellbeing is related to meeting online contacts IRL: whether adolescents who meet strangers are lonely or, on the contrary, have many friends in daily life. Additionally, self-esteem could be a necessary characteristic to date with a stranger. On the other hand, it could be something insecure adolescents, who want to meet new friends, tend to do. Also other factors like parents' behavior regarding their children's internet use could influence the decision to date a stranger. If this is true, internet-specific parenting could be an instrument to prevent children from meeting strangers. The main question of this study is therefore: To what extent do adolescents' psychosocial wellbeing and their parents' internet-specific parenting influence the chance of meeting online contacts IRL? Furthermore, aspects of internet-specific parenting could moderate the relation between psychosocial wellbeing and meeting online contacts IRL. For instance, it could be that lonely adolescents would want to arrange meetings with strangers, but that they will not be able to do so because parents restrict and monitor their internet use.

There are no known theories or findings available from previous research about the relationship between psychosocial wellbeing or internet-specific parenting and adolescents' tendency to meet online contacts IRL. However, based on findings for related topics, several hypotheses for the current study can be formulated.

Psychosocial wellbeing

The social compensation hypothesis (McKenna & Bargh, 1998; Subrahmanyam & Lin, 2007) offers an interesting perspective for studying the influence of adolescents' psychosocial wellbeing on meeting online contacts IRL. This hypothesis states that adolescents who have few social resources available, for instance lonely, depressed, socially anxious and insecure adolescents, use online communication more often than others in order to compensate for a lack of social contacts IRL. Several studies support the social compensation hypothesis. The results of Gross, Juvonen and Gable (2002) show that loneliness influences who adolescents communicate with on the internet. In a cross-sectional study among 130 students aged 11 to 13 years they found that, in line with the social compensation hypothesis, lonely adolescents more often tend to communicate with complete strangers (Gross, Juvonen & Gable, 2002). The same relation could be expected for adolescents low in self-esteem: just like lonely adolescents, insecure adolescents could be expected to compensate for a lack in social relationships IRL by online communication. Additionally, research found that there exists a positive relation between self-esteem and friendship quality (Franco & Levitt, 1998; Thomas & Daubman, 2001). From this finding could be inferred that adolescents high in self-esteem are very well able to build close friendships IRL, which makes it unlikely that they need the internet in order to make friends.

In studies by Kraut et al. (1998) and Van den Eijnden and Vermulst (2006), no evidence has been found in support of the idea that depressed feelings influence the degree of online communication by adolescents. However, cross-sectional studies show that adolescents' online communication is negatively related to psychosocial wellbeing, because online communication displaces the time they spend with contacts IRL (Kraut et al., 1998; Nie & Hillygus, 2002; Valkenburg & Peter, 2007). In addition, longitudinal study shows that

adolescents who are more depressed have more online communication through the instant messenger (Knippels, 2009). Because these last findings are in line with the social compensation hypothesis, these are the most convincing. When it is assumed that adolescents who have more online communication, have a larger chance to meet online contacts IRL, the aforementioned leads to the following hypothesis: As adolescents experience more feelings of loneliness, depression or low self-esteem, they are more likely to meet online contacts IRL (hypothesis 1).

Social anxiety is characterized by fear of humiliation, embarrassment and negative evaluation by others. Therefore socially anxious people try to avoid social situations as much as possible (Kashdan & Herbert, 2001). According to the social compensation hypothesis, socially anxious adolescents can be expected to compensate this lack of social contact in daily life with online social contact. Mazalin and Moore (2004) indeed found a positive relationship between social anxiety and the time spent in chatrooms. In addition, socially anxious adolescents communicate through instant messenger mainly with persons they do not know at all or only vaguely know in daily life (Gross, Juvonen & Gable, 2002). Socially anxious adolescents more often develop close relationships through the internet, including online close friendships and online romantic relationships (McKenna & Bargh, 1998). The fact that socially anxious adolescents intensively use the possibility to get to know new people online and have online communication with them, is not sufficient reason to believe that they will actually meet the persons they have met online. Socially anxious people avoid social situations IRL, which makes it plausible that they will avoid meeting their online contacts face to face. The corresponding hypothesis is: Adolescents high in social anxiety are less likely to meet online contacts IRL (hypothesis 2).

Internet-specific parenting

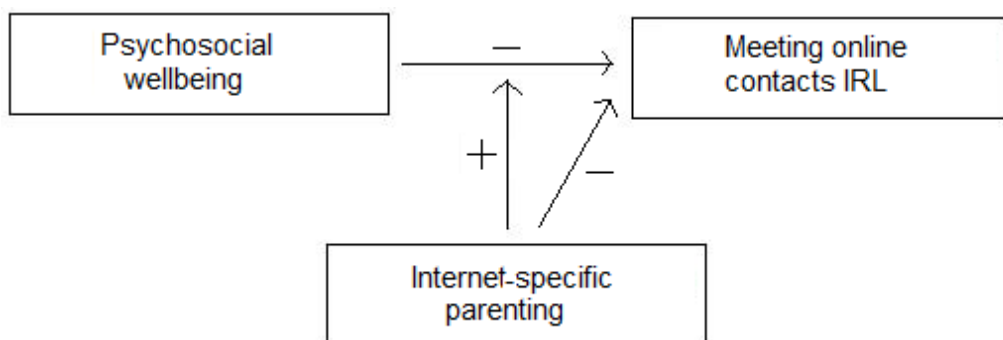
Restrictive internet-specific parenting is defined as parents imposing rules about the duration and the content of their children's internet use and parents monitoring their children's internet use. The study of Rosen, Cheever and Carrier (2008) among 266 adolescents using the profile website MySpace, shows that in case of a stricter internet-specific parenting, adolescents exhibit less risk behavior on the internet and in online communication. Meeting strangers is a form of risk behavior. Consequently, it is expected that more restrictive internet-specific parenting makes it less likely for adolescents to meet online contacts IRL. A longitudinal study among Dutch adolescents from 11 to 15 years old additionally demonstrates that adolescents who grow up with a stricter internet-specific parenting are less likely to use the internet excessively and to have less frequent online communication (Van den Eijnden et al., 2009). However, the empiricism is not conclusive regarding the influence of limitations in the duration of internet use. The cross-sectional data of Lee and Chae (2007) show that adolescents who are restricted in their time spent online, do not use the internet less frequently than other adolescents. Additionally, Van den Eijnden et al. (2009) found with both cross-sectional and longitudinal data, that more rules regarding the duration of the internet use is related to a higher chance to be an excessive internet user. Despite these inconclusive findings regarding limitations in the duration of internet use, it can be argued that adolescents who have fewer opportunities to communicate online probably have less online contacts and fewer opportunities to date their online contacts. Combined with the finding that adolescents exhibit less risk behavior through a stricter internet-specific parenting, this leads to the following hypothesis: Adolescents with a stricter parenting regime,

which means stricter rules about the duration and the content of internet use and stricter monitoring of internet use, are less likely to meet online contacts IRL (hypothesis 3).

Besides restrictive internet-specific parenting, there also is social internet-specific parenting, namely the frequency of communication about internet use and the quality of this communication. Assumed that parents want to discourage their children to meet online contacts IRL, it is expected that more communication and a higher quality of communication about internet use have a protective effect, which means it is negatively related to meeting online contacts IRL (hypothesis 4).

Parenting regarding internet use may not only have a direct effect on meeting online contacts IRL, but it may also affect the relationship between the psychosocial wellbeing of adolescents and their tendency to meet online contacts IRL. It is expected that the need of adolescents with a more negative psychosocial wellbeing to meet their online contacts could be reduced or suppressed by a stricter internet-specific parenting. When parents limit the duration or the content of their children's internet use, adolescents for instance cannot communicate online as long as they want to and have less opportunity to have online contacts, let alone meet them IRL. Another assumption is that parents, who know that their child wants to meet someone in person who he or she knows through the internet, will talk about this plan and will probably discourage it in case they have doubts about the safety. When this is discussed more frequently and thoroughgoing, the adolescent is less likely to actually meet online contacts IRL. The associated hypothesis is that internet-specific parenting moderates the relationship between psychosocial wellbeing and meeting someone in person who you have met online. More specifically, it is expected that more internet-specific parenting, both restrictive and social parenting, weakens the negative relationship between the psychosocial wellbeing and meeting online contacts IRL (hypothesis 5). The expected relations are shown in figure 1.

Figure 1: Model of the influence of psychosocial wellbeing and internet-specific parenting on meeting online contacts IRL



Methods

To answer the research question, the data of the Monitor Internet and Youth of the Addiction Research Institute (IVO, The Netherlands) are used. This monitor contains longitudinal data, collected on three different occasions, namely January 2006, January 2007 and March 2008. For the current study, the data from 2007 (T1) and 2008 (T2) were used.

Participants

5237 adolescents between the ages of 10 and 18 years from the two highest classes of primary school and the first two classes of secondary school completed the questionnaires at T1. These adolescents came from 13 different primary schools and 9 secondary schools. 5403 adolescents of 12 different secondary schools participated in this study at T2. There were no participants from primary school on this occasion and some new entrants in the first class of secondary school joined the study. Some adolescents only participated in the study at T1, others only at T2 and others participated on both measurement occasions. This last category includes 2416 adolescents. A summary of the participants is shown in Table 1. All adolescents in the sample lived in the Netherlands during the study and 99% of them were between 10 and 17 years old in 2007. The selection of schools is based on representative data of the distribution of Dutch schools, region and the degree of urbanization.

Measures

Meeting online contacts IRL is assessed through the question: 'Have you ever met someone in person who you have met through the internet?'. In order to perform analysis with a difference between adolescents who have and who have not met someone in person they have met online, the original answers (1: 'Never', 2: '1 person', 3: '2 to 3 persons', 4: '4 to 5 persons', 5: 'More than 5 persons') were converted into 'Yes' or 'No'.

Loneliness was measured using the UCLA Loneliness Scale (Russell, Peplau & Curtona, 1980). Adolescents could indicate how they generally felt about five positive and five

Table 1: Participants

	2007 (T1)	2008 (T2)	2007+2008 (T1+T2)
Number of adolescents	5237	5403	2416
Average age	14.1 (SD=1.4)	14.5 (SD=1.2)	14.8 (SD=1.0)
Gender (%)			
Boys	50.8	48.9	49.5
Girls	49.2	51.1	50.6
Educational level (%)			
Primary school	16.7	0	0
Freshmen	22.6	36.3	32.0 / 14.9
Vmbo ¹	25.4	26.7	23.0 / 27.7
Havo ¹	16.4	17.1	17.3 / 26.7
Vwo ¹	18.9	20.0	27.7 / 30.7
Ethnicity (%)			
Natives	74.8	76.9	74.2
Immigrants	25.2	23.1	25.8

¹ In the Netherlands' secondary school there are three levels of education, which are vmbo (preparatory secondary vocational education), havo (higher general secondary education) and vwo (pre-university education).

negative experiences. Examples are 'There are people I can talk to' and 'I have no real friends'. Answers were given on a 5-point scale ranging from 1 'Not true at all' to 5 'Very true'. The scale of the five positively stated experiences has been reversed, thus a higher score means more loneliness. The scale showed Cronbach's alphas of 0.85 and 0.87 at T1 and T2.

Depression was measured using the Depressive Mood List (Kandel & Davies, 1986), containing six items. Adolescents could indicate how often they had a particular feeling in the last twelve months. An example of an item is 'I felt too tired to do anything'. Answers ranged from 1 'Never' to 5 'Always'. The higher the score, the more depressed an adolescent feels. The scale showed Cronbach's alphas of 0.81 and 0.82 at T1 and T2.

Self-esteem was measured using Rosenbergs Self-esteem Scale (Rosenberg, 1989) where adolescents could indicate how strong they agreed with five positive and five negative statements on a 4-point scale ranging from 1 'Does not fit me at all' to 5 'Fits me very well'. Examples are 'I have the feeling that I have some good characteristics' and 'Sometimes I think I am no good at anything'. Finally the scale for the negative statements was reversed, thus a higher score means more self-esteem. The Cronbach's alphas for self-esteem at T1 and T2 are 0.85 and 0.87.

Social anxiety was measured using two subscales from the Social Anxiety Scale for Children-Revised (La Greca & Stone, 1993). The adolescents could tell how often they had each of ten experiences. An example is 'I find it hard to ask others to do something with me'. The scale showed Cronbach's alphas of 0.86 and 0.88 at T1 and T2.

The variables for internet-specific parenting have been measured using five scales (Van den Eijnden et al., 2009). The strictness of the parents' rules regarding the duration of the internet use was assessed using two negative statements and four positive stated questions. Examples are 'I am allowed to use the internet as often as I want' and 'How often does it happen that your mother, father or caregiver says you may only use the internet until a particular time?'. Answers were given on a 5-point scale ranging from 1 'Not true at all' / 'Never' to 5 'Very true' / 'Very often'. The scale of the statements was reversed, thus a higher score means that parents manage stricter rules for the duration of the internet use. The scale shows Cronbach's alphas of 0.84 and 0.85 at T1 and T2.

The strictness of the rules regarding the content of the internet use was defined by a score on three statements. One of them is 'I may decide myself with whom I have contact through the internet'. Answers were given on a 5-point scale ranging from 1 'Not true at all' to 5 'Very true'. The scores were adjusted, so that a higher score means stricter rules. The Cronbach's alphas for T1 and T2 are 0.82 and 0.83.

Monitoring of excessive internet use was measured by three positive and three negative statements on how parents react to the online behavior of their children. Examples are 'If on a weekend day I would use the internet all day, my parents would let me go my way' and 'If I would use the internet all day on the weekend, my parents would tell me off'. Answers were given on a 5-point scale ranging from 1 'Certainly not' to 5 'Certainly'. The scores of the negative statements are reversed, thus a higher score means more monitoring. The Cronbach's alpha for T1 as well as for T2 is 0.88.

The frequency of the communication about internet use between adolescents and their parents was assessed by three questions. A question is 'Do you ever talk to your parents about who you have contact with on the internet?'. Answers were given on a 5-point scale ranging from 1 'Never' to 5 'Very often'. A higher score means a higher frequency of communication. At T1 the Cronbach's alpha is 0.77 and at T2 0.78.

The quality of communication about internet use between parents and adolescents has been measured with 5-point scores ranging from 1 'Not at all' to 5 'Very much' on three statements like 'When I talk to my parents about using internet or instant messenger, I feel comfortable'. The higher the score, the higher the quality of communication. The scale showed Cronbach's alphas of 0.86 and 0.88 at T1 and T2.

Demographic variables, which are expected to be confounders, are included in the analysis. These are gender, age, level of education and ethnicity. Since meeting strangers at T1 is highly correlated with meeting strangers at T2 (Pearson correlation = 0.408, $p < 0.001$), there is controlled for meeting strangers at T1 in the longitudinal analysis.

Procedure

To answer the descriptive question, about how many and which adolescents have meetings with online contacts IRL, how many parents are aware of this and how often it happens that that the person is lying about his or her identity, a crosstab was made of the variables gender, age, level of education, ethnicity, whether parents knew about the meeting and whether the stranger the adolescents met IRL lied about his or her identity on one side and meeting someone in person you have met online on the other side. It was examined whether the differences in the scores on the variables between adolescents who do and do not meet online contacts IRL are significant using a chi-square test.

For an answer on the second and third partial question, about the relation between psychosocial wellbeing and internet-specific parenting with meeting online contacts IRL, logistic regression analyses were performed. For the data at T1 three models were composed: firstly a model with only the control variables, secondly a model with both the control variables and the four variables of psychosocial wellbeing and the five variables of internet-specific parenting and thirdly a model with all these variables and interaction terms of psychosocial wellbeing and internet-specific parenting. The same applies for the data at T2, and for the data at T2 predicted by T1, until finally there are nine models. This way one can look at cross-sectional relationships at T1 and T2 and look at longitudinal relationships between T1 and T2.

In the cross-sectional analysis all respondents who participated in a specific year are included: both those who only participated once, and those who participated on both surveys in 2007 and 2008. In the longitudinal analysis only the adolescents who participated in both surveys are included. In this last analysis is controlled for meeting strangers at T1.

Because it is expected that internet-specific parenting influences the relationship between psychosocial wellbeing and meeting strangers, for each aspect of internet-specific parenting an interaction term with the five aspects of psychosocial wellbeing is created. To reduce the risk of multicollinearity, the variables are centered first. If an interaction term has a significant effect on meeting strangers, this means that there is a moderation effect and then the direction of this effect could be determined.

Table 2: Correlations

	Meeting online contacts IRL	Loneliness	Depression	Self-esteem	Social anxiety	Rules about duration	Rules about content	Monitoring	Frequenty of communication	Quality of communication
Meeting online contacts IRL	-	0.04**	0.14**	-0.09**	-0.01	-0.02	-0.17**	-0.18**	0.06**	-0.12**
Loneliness	0.02	-	0.37**	-0.53**	0.47**	0.08**	0.05**	-0.01	-0.07**	-0.22**
Depression	0.08**	0.38**	-	-0.49**	0.38**	0.11**	-0.01	-0.03	0.04*	-0.15**
Self-esteem	-0.07**	-0.53**	-0.47**	-	-0.44**	-0.11**	-0.07**	0.01	0.05**	0.23**
Social anxiety	-0.03*	0.46**	0.41**	-0.44**	-	0.12**	0.09**	0.04**	0.03	-0.09**
Rules about duration	-0.02	0.02	0.07**	-0.06**	0.11**	-	0.38**	0.50**	0.15**	-0.07**
Rules about content	-0.18**	-0.00	-0.08**	-0.02	0.04**	0.35**	-	0.40**	0.12**	0.04**
Monitoring	-0.15**	-0.04**	0.01	0.04**	0.06**	0.51**	0.38**	-	0.10**	0.04**
Frequenty of communication	0.04**	-0.11**	0.01	0.05**	0.01	0.20**	0.13**	0.12**	-	0.27**
Quality of communication	-0.06**	-0.24**	-0.10**	0.23**	-0.11**	-0.02	0.05**	0.07**	0.30**	-

Left: correlations at T1. right: correlations at T2.

* $p < 0.05$. ** $p < 0.01$.

Correlations between ordinal variables are measured with Pearson correlation test and correlations between ordinal and nominal variables with Spearman correlation test.

Results

Table 2 shows the correlations of the variables at T1 and T2. This shows that the aspects of psychosocial wellbeing correlate with each other more than to other variables, but that there is only weak or mean correlation. Adolescents who have lonely feelings have somewhat more depressed feelings, less self-esteem and more social anxiety. Apparently some adolescents have more forms of psychosocial problems at the same time. Additionally, the rules about the duration and content of internet use and monitoring of excessive internet use are more related to each other than to other variables, but this also contains only weak or mean correlations.

Profile

From the results shown in Table 3 it can be concluded that at T2 (2008) somewhat more adolescents than at T1 (2007) have actually met online contacts IRL. About half of these adolescents said they have met online contacts IRL only once and others said they have had

Table 3: Differences between adolescents who do and do not meet strangers

	T1 (N=5,237)		T2 (N=5,403)	
Have you ever met someone in person who you have met online?	Yes	No	Yes	No
Average age	14.2 (SD=1.6)	13.6 (SD=1.6)	14.5 (SD=1.4)	14.0 (SD=1.1)
Gender (%)				
Boys	18.9	81.1	18.2	81.8
Girls	11.5	88.5	14.2	85.8
Level of education (%)				
Primary school	11.9	88.1		
Freshmen	10.5	89.5	13.5	86.5
Vmbo	23.8	76.2	19.3	80.7
Havo	15.0	85.0	25.7	74.3
Vwo	11.0	89.0	13.8	86.2
Ethnicity (%)				
Natives	13.8	86.2	14.2	85.8
Immigrants ²	20.5	79.5	23.2	76.8
Have you ever met someone in person who you have met online? (%)	15.3	84.7	16.2	83.8
Did your parents know? (%)				
Yes	27.6		67.8	
No	72.4		32.2	
Did the person lie about identity? (%)				
Yes	4.3		3.8	
No	95.7		96.2	

² Immigrant: Person of whom at least one parent is born in abroad. Source: CBS, 2009.

such a meeting more than once or with more than one person. Table 3 also shows an overview of the distribution of the background variables on the adolescents that have met online contacts IRL. The average age of the respondents who had such a meeting is significantly higher (anova at T1 and T2: $p < 0.001$) than the age of other respondents. The differences between gender, level of education and ethnicity for adolescents who do or do not meet online contacts IRL all show significant results (chi-square tests: $p < 0.001$) but very weak (Cramer's $V < 0.15$). The average age of the respondents who have met online contacts IRL is at T1 and T2 respectively 0.6 and 0.5 years higher than the average age of respondents who never had such a meeting. Boys more often had meetings with online contacts IRL than girls. At T1, meeting online contacts IRL is most common among vmbo-students and at T2 among havo-students. Immigrant adolescents meet online contacts more often than native adolescents. The respondents who met online contacts IRL were asked whether their parents or caretakers knew of this meeting. Here was a difference between T1 and T2: at T2 the adolescents informed their parents much more often of the meeting than a year before. Finally, in about 4% of the cases, the stranger with whom the meeting was arranged lied about his or her identity.

Cross-sectional analysis

Firstly, the cross-sectional analyses of the background variables were performed: this shows to what extent there is an effect of gender, age, level of education and ethnicity on meeting online contacts IRL (not shown in a table). The models for T1 and T2 show that boys have meetings with strangers more often than girls (T1: OR = 0.56, $p < 0.001$, 95% CI = 0.44 - 0.71). A positive relationship appears between the age of adolescents and meeting strangers: older adolescents have such meetings more often (T1: OR = 1.39, $p < 0.001$, 95% CI = 1.27 - 1.53). Additionally, a higher level of education reduces the chance on meeting strangers (T1: OR = 0.89, $p < 0.05$, 95% CI = 0.81 - 0.97). It also appears that immigrants have a larger chance to have a meeting with strangers than natives (T1: OR = 1.79, $p < 0.001$, 95% CI = 1.38 - 2.33). As can be expected from models with only background variables, the proportion of explained variances of these models are very small: the models with only these four variables explain only a minor part of the chance to meet a stranger, namely only 7% at T1 and 5% at T2.

The models 1 and 2 in Table 4 show that loneliness, self-esteem and social anxiety have negative relations with meeting strangers and that depression shows a positive relation. However, it appears that loneliness is the only of four aspects of psychosocial wellbeing that does not show a significant relationship with meeting a stranger in both models.

The models 1 and 2 in Table 4 also show, beside the results of psychosocial wellbeing, the relationships between the five aspects of internet-specific parenting and meeting strangers. All these relationships are significant. There are three aspects of internet-specific parenting that seem to make meeting strangers less likely, namely stricter rules about the content of the internet use, monitoring of excessive internet use and quality of communication between parents and children about internet use. In contrast, there are two aspects of internet-specific parenting that contribute to an increased chance to have a meeting with a stranger, namely stricter rules about the duration of internet use and a higher frequency of communication about internet use.

Table 4: The relationship between psychosocial wellbeing and internet-specific parenting on meeting online contacts IRL

	Model 1 (T1)		Model 2 (T2)		Model 3 (T1 → T2)	
	OR	95% CI	OR	95% CI	OR	95% CI
Background variables						
Gender	0.53***	0.43-0.64	0.65***	0.54-0.78	0.78	0.58-1.06
Age	1.30***	1.20-1.40	1.25***	1.16-1.35	1.06	0.91-1.23
Education	0.90***	0.84-0.96	0.96	0.90-1.02	1.05	0.96-1.14
Ethnicity	1.59***	1.31-1.93	1.48***	1.22-1.80	1.46*	1.07-2.00
Meeting IRL at T1					7.95***	5.68-11.12
Psychosocial wellbeing						
Loneliness	0.81*	0.65-1.00	0.97	0.79-1.18	0.62**	0.43-0.88
Depression	1.39***	1.20-1.60	1.60***	1.39-1.83	1.08	0.85-1.37
Self-esteem	0.62***	0.51-0.76	0.68***	0.56-0.83	0.72*	0.51-1.00
Social anxiety	0.76***	0.65-0.90	0.73***	0.63-0.84	0.94	0.72-1.23
Internet-specific parenting						
Rules about duration	1.43***	1.26-1.62	1.36***	1.20-1.54	1.16	0.94-1.42
Rules about content	0.66***	0.60-0.73	0.71***	0.64-0.78	0.79**	0.67-0.93
Monitoring	0.67***	0.60-0.75	0.60***	0.54-0.78	0.74**	0.62-0.89
Frequency of communication	1.37***	1.24-1.53	1.47***	1.33-1.63	1.08	0.91-1.29
Quality of communication	0.85**	0.78-0.94	0.76***	0.69-0.83	0.79**	0.67-0.93
Constant	0.16*		0.18*		2.64	
R ²	0.17		0.19		0.26	

OR = odds ratios. 95% CI = 95% confidence interval. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Longitudinal analysis

Meeting strangers at T1 was added as a control variable in the longitudinal analysis for the relationship between psychosocial wellbeing and internet-specific parenting at T1 and meeting strangers at T2. This variable and ethnicity are the only variables that show a significant relation with meeting online contacts IRL, when only background variables are included (not shown in a table). It appears that immigrants more often meet strangers at T2 (OR = 1.51, $p < 0.01$, 95% CI = 1.12 - 2.04). The influence of meeting strangers at T1 is very large: adolescents who have met online contacts at T1 almost have a ten times higher chance of such a meeting at T2 (OR = 9.66, $p < 0.001$, 95% CI = 7.07 - 13.19).

Model 3 in Table 4 shows that loneliness and self-esteem at T1 both have a negative relationship with meeting strangers at T2. This is an indication of the existence of a causal relationship between loneliness and self-esteem on one side and meeting strangers on the other. Thus, adolescents who feel lonely and adolescents who experience a high self-esteem have a lower odds of meeting online contacts IRL. In addition, there are three aspects of internet-specific parenting that, as shown in model 3 in Table 3, show a relationship to meeting strangers: stricter rules about the content of the internet use, monitoring of excessive internet use and a high quality of communication between parents and children about internet use at T1 predict a lower chance that adolescents will meet strangers at T2. These results form an indication for causality, namely that stricter rules about content, more

monitoring and a higher quality of communication could protect children from meeting online contacts IRL. In these results, there is no indication for a causal relation between stricter rules about the duration of internet use and a higher frequency of communication about this with meeting someone you have met online.

None of the twenty interaction terms produce a significant relationship to meeting strangers. Therefore these results are not included in Table 3.

Discussion

The main purpose of the present study was to get a better insight into the relation of adolescents' psychosocial wellbeing and internet-specific parenting with meeting online contacts IRL. Several studies have shown that the social compensation hypothesis, which states that adolescents with few social resources use online communication more often in order to compensate for a lack of social contacts IRL (McKenna & Bargh, 1998; Subrahmanyam & Lin, 2007), is true for adolescents with lonely feelings (Gross, Juvonen & Gable, 2002), depressed feelings (Knippels, 2009) and with feelings of low self-esteem. In accordance with the results from previous research, the present longitudinal findings indicate that adolescents low in self-esteem have a larger chance to meet online contacts IRL (hypothesis 1). Moreover, in line with hypothesis 1 and the social compensation hypothesis, cross-sectionally, a positive relation between depression and meeting online contacts IRL was found. Thus, depressed feelings are related to a larger chance to meet online contacts IRL, but this is no causal relationship.

On the other hand, the longitudinal result regarding loneliness points exactly in the opposite direction and does not support the social compensation hypothesis: i.e. more feelings of loneliness predict a smaller chance to meet online contacts IRL a year later. This unexpected result seems to suggest that lonely adolescents may get into a downward spiral, whereby feelings of loneliness lead to a decrease in social engagement, which leads to even more feelings of loneliness (Rubenstein & Shaver, 1982). Similar results are found by Kraut et al. (1998) and Van den Eijnden et al. (2008). Therefore, contrary to the social compensation hypothesis, the internet and online contacts do not seem to be a solution for lonely adolescents. As predicted in hypothesis 2, social anxiety, like loneliness, is negatively related to meeting online contacts IRL. This finding, however, is only supported by cross-sectional analysis. A possible explanation for this finding is that socially anxious adolescents avoid social situations in daily life, which makes it plausible that they will avoid meeting their online contacts face to face.

As far as we know, no previous studies addressed the relationship between internet-specific parenting behavior and meeting online contacts IRL. Yet, the present findings indicate that hypothesis 3, that more restrictive internet-specific parenting causes a smaller chance to meet online contacts IRL, is only partially true: only stricter rules about the content of internet use and more monitoring predict a smaller chance to meet online contacts IRL a year later. In contrast, cross-sectional analysis show that when adolescents experience stricter rules about the duration of their internet use, they may have a larger chance to meet online contacts IRL. Additionally, in agreement with hypothesis 4, the present findings from longitudinal analysis suggest that there is a negative causal relationship between the quality of communication about internet use and meeting online contacts IRL a year later. In contrast, cross-sectional analysis show that a higher frequency of communication about internet use is related to a larger chance to meet online contacts IRL. From these results, the conclusion could be drawn that parents should not talk too frequently but more serious about

internet use with their children. This unexpected result and the aforementioned result of stricter rules about the duration of internet use predicting a larger chance to meet online contacts IRL, could possibly result from a reverse causation: when parents know that their children meet strangers, they try to prevent their children to have such meetings again by both restricting the time they may spend online and talk to them about their online behavior. Similar results were found in recent longitudinal research on alcohol-specific parenting, indicating that the more often parents talk to their children about alcohol use, the larger the chance that they will drink (Van der Vorst et al., 2010). Yet, to find out how this really works for internet-specific parenting, more research is necessary.

No significant moderation effects are found of internet-specific parenting on the relation between psychosocial wellbeing and meeting online contacts IRL. This is a striking result because it was expected that any need to meet online contacts IRL would be reduced or suppressed by a stricter internet-specific parenting. In contrast to hypothesis 5, according to the present data, the influence of psychosocial wellbeing is not strengthened by internet-specific parenting.

Overall, the results show that the profile of the adolescent who meets online contacts IRL is an adolescent low in self-esteem and possibly with depressed feelings, who does not feel lonely or socially anxious. The current study is practical relevant to parents who do not want their children to meet online contacts IRL, because it shows how internet-specific parenting could help to prevent adolescents from meeting online contacts IRL. The results indicate that, in that case, it would be wise to impose strict rules about the content of their child's internet use, to monitor their internet use and to have thoroughgoing communication about it.

Limitations

An issue to think about reading the current results is how the participants interpret the question 'Have you ever met someone in person who you have met through the internet?' There is no explanation given on what is actually meant by 'meeting someone in person' in the questionnaire. The participant could think this question is about romantic dates, about friendships, about meeting someone while getting stuff you have bought through E-Bay or a combination of the above. This could cause a discrepancy in the reported meetings and the amount of meetings actually happened.

A limitation of this study is that the data contain self-reports of adolescents. The measures of the psychosocial wellbeing, the internet-specific parenting as well as meeting online contacts IRL come from the same source: the adolescent. This means there are the problems of common method variance, consistency motif and social desirability (Podsakoff & Organ, 1986): any defect in the answers of one adolescent points presumably in the same direction, there could be a consistent line in a series of answers of one respondent and the adolescents could give answers that they think are socially desirable.

The models in this study have small proportion explained variances. In the model for longitudinal analysis the proportion explained variance is 0.26 and in the models for cross-sectional analysis this parameter is 0.17 at T1 and 0.19 at T2. This means that adolescents' psychological wellbeing and internet-specific parenting explain at least a part of meeting online contacts IRL, but this is only a limited part. In further research, other variables that possibly affect meeting online contacts IRL, for example peer influence, could be examined.

Finally, in the current study, the influence of adolescents' psychosocial wellbeing and their parents internet-specific parenting behavior on meeting online contacts IRL is considered only in one direction. However, it is not unlikely that a relation exists in opposite direction too: possibly there is a causal relation between meeting online contacts IRL and psychosocial wellbeing and the strictness of internet-specific parenting. To get a better insight into the impact that meeting online contacts IRL has on adolescents, future longitudinal research is needed using cross-lagged panel analysis.

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³ Algemeen Nederlands Persbureau [Universal Dutch news agency]

⁴ Centraal Bureau voor de Statistiek [Dutch Central Bureau of Statistics]

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