UNIVERSITEIT VAN TILBURG

Will we continue to be friends?

Risk factors of friendship erosion and dissolution;
A longitudinal analysis from a marital dissolution perspective

Maarten Balvers
June 2008

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A longitudinal analysis from a marital dissolution perspective

Master thesis submitted as completion of the master in Sociology
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Abstract

This study investigated the usefulness of perspectives on marital dissolution, to identify risk factors of friendship erosion and friendship dissolution, using two wave longitudinal data from the Netherlands Kinship Panel Study among 5.248 respondents in The Netherlands. The most influential theories on marital dissolution were forged into one comprehensive view, which was applied on friendship erosion and dissolution. This comprehensive view was formulated as follows; the probability of dissolution (a) negatively depends on the amount of rewards, (b) is positively affected the amount of costs, (c) is positively related to the level of alternatives, and (d) is negatively related to investment size. Results from OLS and logistic regression analyses show that friendship rewards are negatively related to friendship erosion and dissolution, supporting the first hypothesis. Mixed support is found for the costs hypothesis. In addition, mixed results are found for the level of alternatives. Furthermore, in general the investment hypothesis is confirmed. Finally, results reveal that the effects of costs are sometimes mediated by the level of investments. Overall, this study has proved that the perspectives on marital dissolution provide a good starting point and theoretical framework to investigate friendship erosion and dissolution.

Samenvatting

Deze studie onderzoekt de bruikbaarheid van verschillende scheidingstheorieën voor het onderzoeken van de erosie en de verbreking van vriendschappen. Er wordt gebruik gemaakt van de twee waves van de "Netherlands Kinship Panel Study". In totaal worden er 5,248 mensen onderzocht. De meest invloedrijke scheidingstheorieën zijn samengebracht tot één algemeen perspectief, dat vervolgens is toegepast op vriendschapserosie en de verbreking van vriendschappen. Het algemene perspectief luidt als volgt: de kans op verbreking hangt(a) negatief samen met vriendschapsbaten, (b) hangt positief samen met vriendschapskosten, (c) is positief gerelateerd aan het niveau van alternatieven en (d) is negatief gerelateerd aan de hoeveelheid investeringen. Resultaten van OLS en logistische regressies laten zien dat vriendschapsbaten de kans op verbreking en vriendschapserosie negatief beïnvloeden, dit is in overeenstemming met de eerste hypothese. Verdeelde steun is gevonden voor de kostenhypothese en de alternatievenhypothese. Daarnaast, wordt de investeringshypothese over het algemeen bevestigd. Ten slotte, het effect van vriendschapskosten wordt soms gemediteerd door het effect van vriendschapsinvesteringen. Concluderend kan men zeggen dat de scheidingstheorieën een goede basis vormen om vriendschapserosie en verbreking te onderzoeken.

Preface

Writing this thesis marks the end of a long career as a student. Ten years ago I started studying and although it has not always been easy, I have made it. After a six years' wander at the University of Eindhoven I came to the conclusion that the exact sciences were not what suited me. After a difficult decision I started studying sociology here at Tilburg University. I am glad I made that choice, I feel right at home in the social sciences. Looking back at these past ten years I can say that I have matured not only cognitively but also socially and that I am ready to take the next step.

I would like to take the opportunity to thank my supervisor, professor Matthijs Kalmijn. Your sharp mind and precise comments have been a great guide in writing this thesis. You gave me the freedom to explore and helped when needed, thank you for that. Furthermore, I would like to thank my fellow students; you have made the last four years at the university a great pleasure. You unconsciously contributed to my success by creating a pleasant atmosphere to work in.

Of course I also would like to thank my family. Joost, thank you for believing in me, I know you can do it, too. Mom, dad it took me a while, I know you sometimes thought I would never graduate. You can relax now, I did it.

Finally, I would like to address myself to you Lai, without you I would have probably not even studied sociology. Thank you for supporting me, stimulating me, and helping me put things in perspective, you are my best friend.

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1 Introduction

Friendships are valuable and important in the lives of many people. Literature shows that friendships have extensive benefits and functions. First of all, friendships provide people with social support, a sense of belonging and help people shape norms, values and beliefs (Fullerton and Ursanno, 1994; Vanzetti and Duck, 1996). According to Cole and Bradac (1996), best friendships are, in this context, of particular importance because they offer enjoyment, acceptance, intimacy, respect, trust, spontaneity, stability, and self disclosure opportunities. Other studies point towards the importance and benefits of instrumental and emotional support exchanged both within adolescent friendships (Richey and Richey, 1980) and in older adult friendships (Klein Ikkink and van Tilburg 1999). In addition, friendships provide protection against loneliness, social exclusion and with that, prevent people becoming emotional depressed. This applies both to older adults (Essex and Nam, 1989; Stevens, 2001; Stevens and van Tilburg 2000) and to adolescents (Owens, 2003; Oswald and Clark, 2003; Ueno, 2005).

Considering that individuals benefit from having friends, it is important to understand what makes friendships last and what contributes to their failure. Most research on friendships is centred more on the formation and functioning of friendships (e.g. Athanasiou and Yoshioka, 1973; Guralnick, Gottman and Hammond, 1996; Hallinan, 1978; Nahemow and Lawton, 1975; Reeder, 2003; Rook, 1991) than on the risk factors associated with friendship erosion or dissolution. This study will focus on analysing risks factors of friendship dissolution and erosion.

The lack of literature on friendship dissolution and erosion also reflects a lack of a comprehensive theoretical perspective on friendship erosion and dissolution. Therefore, this study will use obtained knowledge from other fields of interpersonal relationship research. More specifically friendship erosion will be examined from a perspective on marital dissolution. The central research question is:

> *To what extent can friendship dissolution and friendship erosion be examined from a perspective on marital dissolution?*

Theories on marital dissolution have been developed in different fields of the social sciences. Becker, Landes and Michael, (1977) developed an analysis of marital instability from a pure economic perspective. In addition, from a social-psychological approach Rusbult (1980a) proposes the Investment model and Levinger (1979) formulated his perspective on marital dissolution. The theories have in common that marital dissolution is viewed as a function of, (a) the balance between costs and

rewards within the relationship, (b) the quality of alternatives and (c) of investments. Examples of rewards are affection, love and support but also economic benefits such as a more effective task specialisation within a household. Time, money and efforts can be viewed exemplary for costs within a relationship. A marriage is situated in a social surrounding and thus other people may turn out to be better suited partners, which can threaten the relationship. Investments are costs or benefits lost that occur when the relationship is terminated. Hence, Investments can viewed as resources that are attached to the relationship and which are lost and less valuable when the relationship is terminated The theories and their implications will be discussed in detail in chapter two.

To answer the central research question several research questions are formulated. First of all a descriptive question is stated, followed by four questions paralleling the four components predicting marital dissolution.

- *To what extent does friendship erosion and dissolution occur? [Q1]*
- *Are friendship rewards associated with friendship erosion and dissolution? [Q2]*
- *Are friendship costs related to friendship erosion and dissolution? [Q3]*
- *To what extent does the number and availability of alternatives influence friendship erosion and dissolution? [Q4]*
- *Do investments relate to friendship erosion and dissolution? [Q5]*

1.1 Literature review

Although the literature on friendship dissolution is not as extensive as that on friendship formation, there are a few studies that in varying degree examine friendship stability. The following section will provide a detailed discussion of these studies. At the end, the findings will be evaluated and points of improvement will be indicated.

One of the few studies which has explicitly analysed friendships in terms of costs, rewards, alternatives, and investments is Rusbult's (1980b) study on satisfaction and commitment in friendships. Rusbult examined to what extent her Investment Model could be generalised towards friendships. According to the Investment Model, satisfaction with and commitment to maintaining relations are separate theoretical concepts. Commitment in Rusbult's model can be viewed as the subjective assessment of the strength of the relationship and it is measured as the subjective assessment of the likelihood of dissolution. The Investment Model thesis states that satisfaction with a friendship is predicted by the costs and rewards of that friendship, whereas commitment towards maintaining is a function of satisfaction, the quality of alternatives, and investment size. A cross-sectional survey among 114 students, designed to investigate friendship satisfaction and commitment was used. Results from a linear regression showed that a model with costs and rewards predicted satisfaction as good as a model with all four parameters. In other words, as expected, friendship

satisfaction was best predicted by the costs and rewards. The analysis of commitment revealed that a model with satisfaction, alternatives and investments predicted commitment best. Each of the three predictors was systematically eliminated from the model. The elimination of each of the predictors significantly worsened the predictive ability of the model. Although the actual deterioration or termination of friendships is not investigated in this study, it still provides a good starting point for the analysis of friendships because it is to be expected that commitment to maintain a friendship is highly correlated with the chance of dissolution and friendship erosion.

A criticism to Rusbult's social-psychological approach is that often too direct measures are used to test theoretical constructs. For example Rusbult measures the level of alternatives by asking "How appealing are your alternatives to your friendship". In the sociological tradition, it is more common to use objective proxies for example "Please name all your best friends" or "how good are you at making new friends". In my opinion, the use of proxies has several advantages. First, it contributes to a more objective measure of the theoretical concepts because in direct measures the phrasing is often vague and implicit, it is left up to the respondent to interpret what is meant by for example alternatives and investments. Secondly, using proxies offers the possibility to stretch the reach of the theory and thereby broaden the theoretical scope.

Oswald and Clark (2003) examined changes in high school best friendships during the transition from high school to college among 137, mainly female students. First of all, they investigated changes in levels of friendship commitment, satisfaction, rewards, costs, alternatives, and investments (Rusbult's Investment Model variables) from fall to spring. Secondly, Oswald and Clark investigated the relation between friendship dissolution and maintenance behaviours such as positivity, (e.g. how often are you up beat cheerful when together?), supportiveness, (e.g. how often do you provide support to each other?), self-disclosure (e.g. how often do you share private thoughts together?) and interaction (e.g. how often do you go to social gatherings together?). As predicted from Rusbult's Investment Model (1980b) friendship commitment, satisfaction, rewards and investments declined and costs and alternatives increased in the period from fall to spring. Furthermore, a logistic regression analysis revealed that higher levels of maintenance behaviours of positivity, supportiveness, self-disclosure, and interaction were associated with upholding the friendship during the observed period. More interesting, proximity, which is defined as living in the same town, did not mediate the changes in the Investment Model variables nor did it affect friendship maintenance directly. On the contrary, the level of communication, measured as weekly contact by phone, did mediate the changes in the Investment Model variables and friendship with high levels of communication had a greater chance of continuation. Although Oswald and Clark nicely demonstrated that maintenance behaviours of positivity, supportiveness, self-disclosure and interaction predicted friendship continuation, they failed to investigate if, and to what extent the Investment Model variables and changes within these variables predict friendship deterioration. And even though proximity itself did not affect best friendships, changes in proximity might well influence the continuation of friendships, assuming that

moving further apart creates more costs, in terms of time and effort, to uphold the friendship compared to the situation under which the friendship is formed. This increase in costs might affect the friendships which parallels the critic stated earlier.

Recently Branje, Frijns, Finkenauer, Engels and Meeus (2007) investigated the usefulness of Rusbult's Investment Model in predicting adolescent friendship commitment and stability using a two-wave longitudinal survey among 678 early and 317 middle adolescents. Stability is assessed in two ways. First, they distinguished between stable and non stable friendships. A friendship is considered to be stable when the same best friend is named at both the interviews and considered to be non-stable when this is not the case. Secondly, they assessed friendship stability by asking the tendency to switch best fiends. Branje et al. (2007) first analyzed the stable and non-stable friendships. Results showed that adolescents that reported a different best friend one year later also reported lower levels of satisfaction, investments and commitment in the first wave than those reporting the same best friend during the second interview. Furthermore, a logistic analysis showed that of the Investment Model variables only the quality of alternatives significantly contributed to the chance of having the same best friend one year later. The examination of stable friendships separately revealed several things. First, a longitudinal analysis of commitment among stable friendships showed that the quality of alternatives is a longitudinal predictive of wave two commitment. Secondly, those in stable friendships reporting high levels of satisfaction, investments, commitment and low quality of alternatives reported a lower tendency to switch best friends during the first wave than those reporting lower levels of satisfaction, investments, commitment and high quality of alternatives. Furthermore, a longitudinal analysis of the tendency to switch best friends among stable friendships showed that commitment fully mediated the effects of the Investment Model variables. In other words, those who are strongly committed in a stable friendship were less intended to switch friends at the second interview. Although Branje et al. (2007) contributed to the broadening of the scope of usefulness of Rusbult's Investment model by predicting adolescence friendship commitment, stability and tendency to switch from the model, they neglected to include costs and rewards into the model. In addition, as regards content, the borderline between commitment to and tendency to switch best friends is in my opinion very thin. Furthermore, they did not investigate whether friendship commitment fully or partially mediated the effects of satisfaction, investments and alternatives on the chance of having a stable friendship.

Owens (2003) took a different approach and investigated in her dissertation the link between eleven friendship features (support and resources, trust, similarity, common experiences, commitment, intimate communication, balance of costs and rewards, personal characteristics and behaviours, length of friendship, amount of time spent with friend, closeness of the friendship, and expected ease of finding a new friend) and friendship outcomes (friendship quality, friendship maintenance versus friendship dissolution) after a problem had occurred within the friendship. In a retrospective survey respondents were asked about both college and pre-college friendships. Respondents were asked to think of a problem that occurred within a college and pre-college friendship (it was left up to

respondent to interpret this) and then answer questions about the friendship before and after the problem. Results, among 241 college students showed that pre-college friendships were more susceptible to problems and dissolution than were college friendships. Furthermore, friendship quality of pre-college and college friendships was significantly predicted by expected ease of finding a new friend, commitment and length of friendship. In addition, the quality of pre-college friendships was also predicted by higher levels of similarity. More rewarding college friendships and, contrastive to the expectation, lower levels of trust contributed to greater college friendship quality after problems. The expected ease of finding a new friend is also associated with a higher chance of terminating both a pre-college and a college friendship. Strikingly after a problem, current common experiences contributed to a greater chance of terminating a pre-college friendship. Finally, rewarding and supportive college friendships had a greater chance of being maintained than costly and unsupportive college friendships. Opposite to what was expected, high levels of communication were related to college friendship dissolution. A critical note toward Owens' study is that it is quite questionable if respondents are able to objectively assess the friendship features if the friendship is dissolved or severely deteriorated. It can be assumed that people will assess a dissolved or deteriorated friendship more negatively than a friendship that is upheld after a problem. Overall, the most interesting result is that the expected ease of finding a new friend is significant in both predicting pre-college and college friendship quality and dissolution. This supports the notion that alternatives are of interest in explaining friendship erosion.

Klein Ikkink and van Tilburg (1999) focused primarily on the relation between support exchange and the chance of dissolution of a relationship, among older adults, age 55 and older, in the Netherlands. Following the exchange theory they assumed that balanced support relations were more likely to be continued. However, a multilevel logistic regression analysis showed that relations where older adults are being overbenefited with instrumental support are more likely to be continued, whereas relations where the older adults are overbenefited in emotional support are less likely to be continued compared to balanced relationships. Furthermore, the type of relationship has also a significant effect on whether a relation is upheld. Close kin relationships are more likely to be continued than relationships with less close kin, friends, and neighbours. The interaction of support exchange with the type of relationship revealed that in older adult friendships it is also true that overbenefiting the older adult with instrumental support has a positive and overbenefiting the older adult with emotional has a negative effect on the continuation of the friendship. Klein Ikkink and van Tilburg concluded that costs of the relationship are important, higher contact frequency and less travelling time contributed to the continuation of the relationship. The finding that an unbalanced relationship is less likely to be continued when the older adult has a larger social network at his disposal, suggests that the available number of alternatives matters. Klein Ikkink and van Tilburg showed that there probably exists a trade-off between instrumental support and emotional support, where the older adult compensates a lack of instrumental support by giving emotional support. The

question remains whether this is also true for younger adults. Furthermore, they failed to investigate the interaction effects of the costs, travelling time, with each type of relationship.

Kalmijn (2003) examined the termination of friendships from a network perspective and tested the dyadic withdrawal hypothesis in The Netherlands. The hypothesis argues that friendship networks become smaller and more overlapping with that of the partner when entering in a cohabiting relationship. In general the dyadic withdrawal hypothesis was supported. The results from a national representative survey among 2977 respondents showed that the number of friends and number of contacts with friends decreased when people start dating and enter marriage. Beside these discrete effects, the decline of number of friends and contact over the life course was also caused by the continuous effect of age. In other words, the older people were, the fewer friends and contacts they reported. Furthermore the results also revealed an increase in overlap of friendship networks between partners across the life course. When dating couples started living together the number of shared contacts and shared friend increased. Also, when children left the parental home the overlap in friendship networks increased. The transition to parenthood on the other hand had a negative effect on the degree of overlap for women. All together, the results indicated that women are socially less dependent in marriage than men. Even though the overlap in friendship networks is not at the core of the study it still may be useful in explaining differences between men and women. Although Kalmijn nicely showed in his study that the shrinkage of the friendship network and the overlap in friendship networks is due to discrete and continuous life course effects, the question which friendships are terminated and which are continued is not addressed in this study and thus still remains unclear. Furthermore, it might be that the life course transitions fit the "cost argument" made by Rusbult (1980a, 1980b) and Levinger (1979). For example, the nurturing of small children costs a lot of time and thus the transition parenthood puts a lot of strain on the time budget of the parent which can go at the expense of the time spent on a friendship. Other life course transitions fit the "alternatives argument", for example starting living together with a partner can be an alternative to friendship, a partner can also provided love, affection and support.

Martin and Yeung (2006) investigated the persistence of ties among 503 people who had lived in communes in the United States over a twelve year period. Respondents were interviewed for the first time in 1974, 1975, and 1976 and the second wave took place in 1986. The data covers 3792 dyads. Results revealed four findings. First, friendships, even cross-sex ones, did not erode by family formation. Getting married and the transition to parenthood did not affect the friendships. Secondly, friendships covering a greater distance were more like to erode, the contact frequency decreased and people were less likely to consider themselves close friends. Furthermore, communes that lasted longer produced more persistent ties. Finally, there were triadic effects. People were more likely to remain in contact with others when they share patterns of contact with third parties. The fact that distance matters corresponds with the "costs argument", the greater the distance the greater the costs in terms of time invested to uphold the friendship. In addition, the triad effects could point towards

Levinger's barriers statement. In other words, the risk of social exclusion or loss of other friendships may retain people from dissolving friendships.

1.2 This study

Summing up the literature review, several striking similarities will be discussed and points of improvement will be indicated. With respect to the outcomes the studies showed some similar results. First, the quality of alternatives seems to play an important role in friendship dissolution. Not only in the studies directly applying Rusbult's' model the alternatives predicted friendship stability but also indirect measures of alternatives seem to predict friendship erosion. Expected ease of finding a new friend (Owens, 2003) and network size (Klein Ikkink and van Tilburg, 1999) both predicted the chance of breaking up a friendship. Secondly, life course transitions had their effect on friendship erosion, the transition to college (Oswald and Clark, 2003) dating and getting married (Kalmijn, 2003) increased the chance of losing friends. It can be assumed that this parallels the "costs argument" and the "alternatives argument" made by Levinger and Rusbult. The negative association of distances with friendship maintenance (Martin and Yeung 2006) can also be fitted into the costs argument, although this is not supported by Oswald and Clark (2003) Overall, the studies indicated that examining friendship in terms of costs, rewards, investments, and alternatives seems to provide a promising and fruitful starting point to come to a more comprehensive theory on friendship dissolution.

There are several points on which this study will improve. First of all, although there have been attempts to apply Rusbult's Investment Model on friendship commitment and stability, not many studies studied the actual dissolution or deterioration. Rusbult (1980b) applied her model on commitment in friendship, but she did not analyse the effects of the variables on friendship dissolution. Oswald and Clark (2003) examined changes in Investment Model variables during the transition to college but did not predict friendship erosion from these variables. Only Branje et al. (2007) applied the Investment Model on actual friendship termination. The actual behavioural act of discontinuing a friendship is only analysed by Branje et al (2007). Hence, the first addition to the existing literature is that friendship erosion will be analysed in terms of actual behaviour. Secondly, the studies that applied Rusbult's model used mostly direct measures to measure the theoretical constructs, this study will use proxies instead of direct measures and with that provide more objective measures. In doing so, it will also broaden the theoretical scope of the Investment Model. Furthermore, the studies examined friendship erosion only among specific groups. Rusbult (1980b), Oswald and Clark (2003) and Owens (2003) surveyed relative small groups of college students, Branje et al. (2007) examined a group of young and middle adolescents and Klein Ikkink and van Tilburg focused on older adults and mainly kin only. This study will improve on these studies by analysing friendship erosion among a large group with a wide range of ages using large scale representative longitudinal data of the Dutch population.

2 Theoretical framework

Several theoretical frameworks exist on marital commitment, stability, and cohesion. This section will start with a short comparison between a friendship on the one hand and a romantic relationship or marriage on the other hand. Furthermore, a description of the most influential theories will be provided. Thirdly, theories will be evaluated and examined if they fit one comprehensive view on marital and more generally relationship erosion and dissolution. In addition, this comprehensive view will be applied to friendship erosion and dissolution which leads to the formulation of the hypotheses. The theories that will be described and evaluated are:

- Levinger's perspective on marital dissolution (1965, 1979)
- Rusbult's Investment Model (1980a)
- Becker, Landes and Michael's analysis of marital instability (1977)

2.1 Romantic relationship versus close friendships

Romantic relationships and friendships have some characteristics in common, but they also differ on others. First of all, both romantic relationships and friendships are interpersonal relationships between two persons. Both are based on voluntariness and on the mutual liking of the people involved. Furthermore, both can offer benefits such as, social support, affection, and trust. However, romantic and mainly marital relationships also provide some specific rewards, such as a more effective task specialisation within the household. This is due to the fact that friends often do not live together and do not want to share their resources (e.g. time, and skills) with each other that closely. On an intimate level, a romantic or marital partner can fulfil sexual needs which a friend mostly can not. However, Bleske-Rechek and Buss (2001) showed that sexual attractions and the prospect of sex are often important motives, especially for men, to engage in heterogeneous friendships. This means that, the fulfilment of sexual needs can play a role in friendship. Closely related to this difference, is that most `friends are of the same gender whereas most romantic relationship are gender heterogeneous. Another very important difference is that a marriage or romantic relationship is in most cases exclusive whereas a friendship is not. Unlike romantic or marital relationships, individuals can have multiple simultaneous friendships.

2.2 Theoretical overview

Levinger (1965, 1979) applied both Lewin's (1951) ideas of "driving forces" and "restraining forces" and the balance of cost and rewards derived from the social exchange theory (Homans, 1961). Driving forces push people toward a positive situation and away from a negative situation. Restraining forces causes people to restrain themselves to leave a particular situation. Levinger conceives a marriage as a two person group and views the continuation of that group therefore in terms of its cohesiveness. Following Festinger, Schachter, and Black (1950), Levinger considers cohesiveness as a function of the total forces which act on members to remain in any group. Interpreting the total amount of forces in terms of Lewin's driving forces and restraining forces Levinger states that:

> "Inducements to remain in the group in any include the attractiveness of the group itself and the strength of the restraints against leaving it; inducements to leave a group include the attractiveness of alternative relationships and the restraints against breaking up such a existing relationship (Levinger , 1965, p19)

In other words, according to Levinger, marital cohesiveness and thus marital dissolution, is determined by the attractions and barriers within the relationships and inverse determined by such attractions and barriers from other relationships affecting the marriage. The attractions within the relationship are directly associated with the perceived rewards and inversely with the perceived costs within that relationship. Rewards are positive outcomes of the relationship and can include love, affection, support and security. Costs can be defined as demands necessary to uphold the relationship such as time, money and energy. Barrier forces are costs that occur when the relationship is terminated. Barriers can be internal to the relationship (e.g. children) or external to the relationship (e.g. existing norm against marital break-up). Alternative attractions are associated with the perceived costs and rewards of the alternative. Following Homans' rationality proposition (1961), Levinger states that people evaluate the alternative rewards and costs also in terms of the probability that the reward or cost will occur. This means that the most appealing alternative might not yield the greatest reward if the perceived probability of receiving the alternative is low.

Rusbult (1980a) proposes the Investment Model, which builds on Kelley's and Thibaut's Interdependence Theory (1978). Kelley and Thibaut suggest that the outcome of social interaction can be broken down into rewards and costs. Compiling the rewards and costs together leads to an overall assessment of the "goodness of outcome". Furthermore, Kelley and Thibaut propose that a relationship is continued when the so called "standards of acceptability" are met for both partners. Because the "standards of acceptability" are individual they can differ among the people involved in the relationship; the relationship can be acceptable for one person and unacceptable for the other. The first "standard of acceptability" is the comparison level, which is compared to the "goodness of outcome". When the "goodness of outcome" exceeds the comparison level the relationship is experienced as satisfying. In other words, when the rewards minus the costs are greater than what one thinks to

deserve, the relationship is satisfying to that person. The second "standard of acceptability" is the comparison level for alternatives, which is the lowest level of outcome that is acceptable when taking all alternatives into account. People do not only evaluate the balance of rewards and costs of the existing relation, but they also compare the relationship with the quality of the alternatives. If a person comes to the conclusion that the current relationship is better than any other known alternative this person is dependent on this relationship to fulfil important needs. Hence, a person can both be satisfied with and dependent on a relationship at the same time. According to Rusbult (1980a) commitment is the subjective experience of dependency. In other words commitment is "... the tendency to maintain a relationship and to feel psychologically "attached" to it...." (Rusbult, 1983 p102). When predicting marital dissolution, Rusbult makes the methodological assumption that commitment predicts marital break-up. Analogous to the Interdependence Theory, Rusbult views satisfaction with a relationship and commitment towards a relationship as two separate concepts. Satisfaction is determined by the balance of costs and rewards in comparison to the expected balance. Still following the Interdependence Theory, commitment is positively related to the amount of satisfaction and negatively related to quality of the alternatives. Compared to Levinger, Rusbult added investment size to the model to predict commitment. Investments are viewed by Rusbult as resources that are attached to the relationship and which are lost when the relationship is terminated. Hence, Rusbult's Investment Model, states that the commitment of maintaining a relationship is a function of satisfaction, the quality of alternatives, and investment size. The Investment Model can be summarised into the following four equations:

Satisfaction = (Rewards - Costs) - Comparison Level [1]

Commitment = Satisfaction - Quality of Alternatives + Investments size [2]

Stay/leave = Commitment [3]

Substituting equation one and two in equation three leads to the overall equation

Stay/leave = f {(Rewards - Costs); Comparison Level; Quality of Alternatives; Investments size} [4]

Often the comparison level is left out of the equation to avoid complication. It can be assumed that when asking people to asses their relational rewards and costs, they implicitly will do this in comparison to what they think they deserve. In sum, according to Rusbult, marital dissolution is predicted by perceived rewards, costs, alternatives and investments.

Becker, Landes, and Michael's analysis of marital instability (1977) provides a purely economic and rational perspective on marital dissolution. According to Becker, Landes and Michael, households produce non-marketable commodities of which people want to maximise the utility over the lifespan. The present value of the stream of commodities is called the full wealth. Consequently, people want to maximise their full wealth. Furthermore, each of the marital strategies produces a known amount of full wealth. This means that people are assumed to know what the value is when they are single, in a

cohabiting relationship or a marriage. The theory then assumes that people rank each of the marital strategies and chose that one with the highest full wealth. This means that dissolution can be a deliberate choice even before one gets married. Up to this point, it is assumed that the full wealth of a marital status can always be fully anticipated, but Becker, Landes, and Michael, also introduce the concept of uncertainty. This means that unexpected unfavourable outcomes may occur which can cause other marital strategies to become more favourable in terms of full wealth leading to dissolution. Becker, Landes, and Michael come to following conclusion:

> "The probability of divorce is smaller the greater the expected gain from marriage, and the smaller the variance of the distribution of unanticipated gains from marriage (Becker, Landes, and Michael, 1977 p1143)"

Furthermore, Becker, Landes, and Michael state that the wealth in a marriage is not created by one person alone, but by both spouses in the relationship. This means that the combined wealth in marriage is compared to the wealth of both spouses when separated. Dissolution of the marriage would occur when the expected combined marriage-wealth is lower than the separate wealth. This means that a person's gain can compensate another one's loss. In other words, the division of wealth in a marriage is flexible.

Besides that expected positive outcomes lower and unexpected negative outcomes raise the probabilities of marital dissolution, Becker, Landes, and Michael, also predict that search costs are positively and marital-specific capital is negatively related to the marital dissolution probabilities. Search costs are the costs of finding a satisfactory mate and the costs can vary among people, because some people possess rare traits that can be matched with difficulty. These search costs can seriously lower the gain from marriage and with that increase the chance of dissolution. These search costs can be viewed as a kind of "investment" to find the most optimal partner. The search costs go at the expense of the gain, because gain is defined as rewards minus costs. Marital specific capital is defined by Becker, Landes, and Michael, as "...investments that are significantly less valuable when single..." (Becker, Landes, and Michael 1977 p 1152). Children are the best known example of marital specific capital since one of the parents, usually the father, has much less contact with the children after dissolution and therefore does not gain anymore from the investment in the children. Besides children, sexual compatibility and knowledge of the partner are examples of marital specific capital. Marital specific capital can by definition raise the gain from marriage and it is not valuable when single. Hence, the marriage gain and wealth, in comparison to the separate gain and wealth, increase with marital specific capital, lowering the probability of dissolution.

2.3 Recapitulation

The three theories are now going to be evaluated. Figure 2.1 shows a schematic overview of the main concepts in each theory and how these concepts relate to each other. It is clear that the theories show extensive overlap. First of all, Rusbult and Levinger both make a distinction between the quality of relationship itself and the quality of the alternatives. Both state that one can be satisfied (Rusbult, 1980a) or attracted to (Levinger, 1979) a relationship and dependent on the relationship, because of the lack of better alternatives at the same time. Although not totally exchangeable, Rusbult's satisfaction and Levinger's attractiveness can be viewed as a similar concept, both determined by the balance of costs and rewards within the relationship.

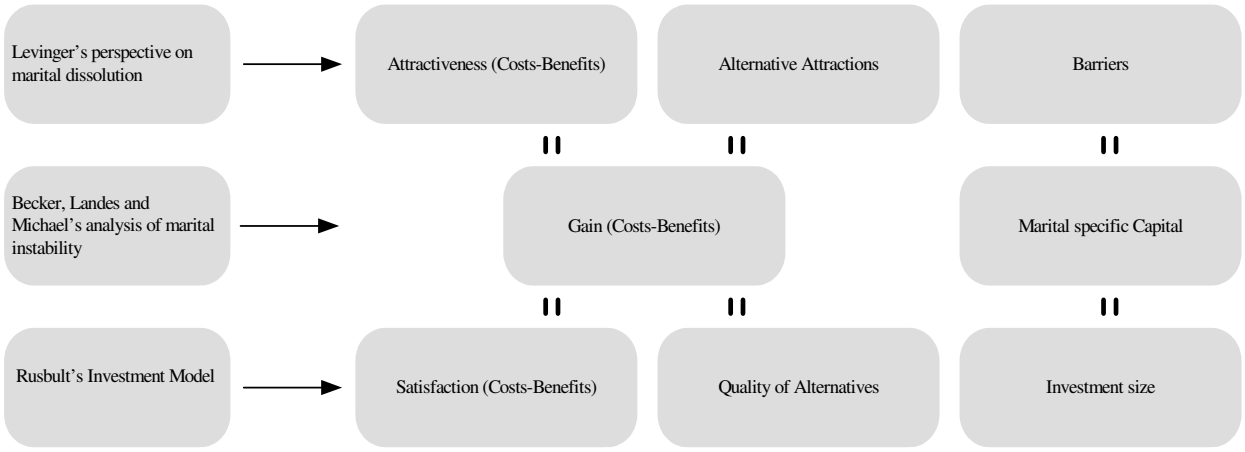

Figure 2.1 Schematic overview of the influential theories on marital dissolution

In addition, both Levinger and Rusbult view the level of alternatives as an important predictor of marital dissolution. Becker, Landes, and Michael do not explicitly speak of alternatives in their theory, but when people asses the gain of the relationship Becker, Landes, and Michael implicitly assume that people will asses the gain in comparison to the other possible relational strategies. Hence, the concept of alternatives does play an important role in Becker, Landes, and Michael's analysis of marital instability. The gain is defined as the rewards minus the costs of the current relationship versus rewards minus the costs of the best alternative. Therefore, Becker, Landes, and Michael's concept of gain can be interpreted the same as Rusbult's satisfaction with the relationship minus the quality of alternatives and Levinger's difference between attractions and alternative attractions. In addition, the concepts of barriers, marital specific capital and investment size are strikingly similar, they all refer to costs or lost benefits that occur when the relationship is terminated. A small difference is that, Rusbult and Levinger consider investments/barriers as a distinct separate predictor of marital dissolution, whereas Becker, Landes, and Michael view marital specific capital as part of the total gain equation.

Overall, the three theories are all based on some kind of form of cost-benefit balance either based on social exchange theory (Rusbult; 1980a; Levinger,1979) or on the rational choice theory (Becker, Landes, and Michael, 1977), all three take the level of alternatives into account, and all three propose that there are specific costs related to terminating a relationship which contribute to upholding the relationship. Therefore, one comprehensive view on marital dissolution can be formulated as follows; the probability of marital dissolution is positively related to the amount of rewards and investment size and is negatively related to the amount of costs and the level of alternatives.

2.4 Interpreting rewards, costs, alternative and investments for the analysis of close friendships; deducting hypotheses

The above synthesis of a comprehensive view on marital dissolution will be applied on the dissolution and erosion of friendships. Fist of all, four fundamental hypotheses concerning friendship dissolution and friendship erosion will be deducted, paralleling the four components of the comprehensive view on marital dissolution. Subsequently, hypotheses for the proxies of each of the components will be derived. At the end of this section a conceptual model will be presented, which will give an overview of all the hypotheses that will be tested. The basic hypotheses are:

- Higher levels of friendship rewards are associated with lower levels of friendship erosion and a smaller chance of friendship dissolution (basic hypothesis 1)
- Higher levels of friendship costs are associated with higher levels of friendship erosion and a smaller chance of friendship dissolution (basic hypothesis 2)
- Higher number of available alternatives are associated with higher levels of friendship erosion and a smaller chance of friendship dissolution (basic hypothesis 3)
- Higher levels of friendship investments are associated with lower levels of friendship erosion and a smaller chance of friendship dissolution (basic hypothesis 4)

2.4.1 Friendship rewards, support exchange

One of the most important rewards that exist within friendships is support (Richey and Richey, 1980; Klein Ikkink and van Tilburg 1999). The benefits of support are extensive, for example, Schwarzer and Leppin (1991) showed that the exchange of support serves as a buffer in crises. Within the existing literature on social support exchange, support is often divided into instrumental and emotional support. Instrumental support covers financial help and help with housekeeping or work around the house, whereas emotional support consists of showing interest and the exchange of advice. Support within a friendship is an exchange process between the two persons involved in the friendship. The exchange of support is distributed is a particular way, a person can be overbenefited with support, one

receives more support then one gives support, one can be underbenefited with support, one gives more then one receives support or the person can be in a balanced relationship, one gives and receives approximately the same amount of support. According to the social exchange theory, exchange in relationships, and thus also within friendships, is based on the norm of reciprocity (Gouldner, 1960). This means that people will want to give and receive a similar amount of support to avoid feelings of exploitation and indebtedness. Therefore, people will tend to favour a balanced exchange of support. Hence, balanced friendships will yield the highest rewards. Following the first basic hypothesis:

- Unbalanced friendships have a higher chance of dissolution and will experience more erosion than balanced friendships (H1a).

The distribution and intensity of support exchange are two separate concepts. Besides the distribution of support, also the intensity of the support exchange can affect friendship erosion and dissolution. The intensity of the support exchange indicates the degree of dependency within the friendship and how important the two people in the friendship are for each others. It might well be that a balanced friendship at a low intensity is more susceptible to erosion and dissolution than an imbalanced friendship at a high intensity. It is to be expected that friendship with a high intensity of support exchange will be less susceptible to erosion and dissolution. The hypothesis is:

- Friendships with a high intensity of support exchange will have a lower chance of dissolution and will experience less erosion than those with a low intensity (H1b)

Friendship rewards can also be approximated with the degree of similarity also referred to as homophily. Similarity offers people mutual confirmation of values, norms, and worldviews (Kalmijn 1998). Furthermore similarity offers people the chance to enjoy common social activities together and it facilitates mutual understanding. This all, create higher levels of attractiveness and liking among similar people than among dissimilar people. The positive relation between similarity and liking is often investigated and confirmed, for example similarity in attitudes (Byrne, 1971, Zeggelink, 1995), personality traits (Buss, 1984), and physical characteristics (Berscheid, Dion,Walster, & Walster, 1971;) are proven to be positively related to liking. It can reasonably be assumed that people who like each other also gain more pleasure from interacting with each other than people who like each other less. In other words, when people in a friendship are more similar, they like each other more and therefore that friendship will be more pleasurable and rewarding. Extending this line of reasoning to friendship erosion and dissolution leads to the following hypothesis:

- Homophily in age, education, gender, child situation, and cohabitation situation is associated with lower levels of erosion and a smaller chance of dissolution (H1c).

2.4.2 Friendship Costs, change in time budget

The time that a friendship consumes is, as already indicated in the introduction, one of the costs that a friendship requires in order to be maintained. Time is a scares resource. And since, all activities require a certain amount of time, all activities "compete" with each other for time. This means that the time consumed by a friendship also has to compete with time that could be spend on other activities such as, work, housekeeping and sports. In other words, a friendship has to be fitted into a person's time budget. When changes in this time budget take place the time spent on friendships can become relatively more expensive or inexpensive accordance to a tighter or broader time budget. Therefore, it is to expected that when a person's time budget becomes tighter the chance of erosion and friendship dissolution increases. The proxies that will be used to measure changes in a person's time budget will be several life course transitions. The nurturing of children, working, and living with a partner all require time that cannot be ignored. Therefore, when people start living together, make the transition to parenthood or start working their time budget becomes tighter. Following the central cost hypothesis, this means that when people start living together, make the transition to parenthood, or start working the chance of friendship erosion and dissolution increases. On the other hand, when people divorce or separate, when their children leave the parental home, or when people loss or quit their jobs, they lose time consuming activities. Hence, breaking up, moving into an empty nest and quit working creates a broader time budget and with that lower the chance of friendship erosion and dissolution. This leads to the following hypotheses:

- Start living together, making the transition to parenthood and start working lead to higher levels of friendship erosion and a greater chance of dissolution than when people will continue to life single, remain childless, and remain without work respectively (H2a).
- Breaking up, moving into an empty nest and quit working lead to lower levels of friendship erosion and a smaller chance of dissolution than when people continue to life in a cohabiting relation, have children at home, and remain employed respectively (H2b).

One transition that directly influences the costs that are needed to maintain the friendship is geographical moving. When people move further apart the costs to see that friend face to face becomes greater in terms of time, money and effort. Therefore when people move further apart the chance of erosion and dissolution is greater.

- Moving further apart leads to higher levels of friendship erosion and a bigger chance of dissolution (H2c).

2.4.3 Alternatives, friend, family, social contact

Rusbult (1980b) and Owens (2003) already indicated that other friendships can be an alternative for the focal friendship. It can be assumed if a person has more friends, the chance that one of the other friends can replace the focal friendships is greater. This means that having more alternative friends is associated with higher levels of erosion and dissolution. Besides other friendship, kin relationships can also act as an alternative for a friendship. Close kin relations too can offer the rewards which a friendship can offer, such as support, love and affection (Klein Ikkink and van Tilburg, 1999). Assuming that siblings can substitute for friends, having more brothers and sisters lead to a greater chance of erosion and dissolution. Furthermore, people who are socially more active encounter more people and are more socially embedded. It is to be expected when people meet a lot of other and new people, the chance of finding an alternative for their friendship will be larger. Hence, socially active people will experience more erosion and have a greater chance of ending a friendship than inactive people. Other close friends and sibling can be viewed as primary alternatives, whereas people newly met at social activities can be viewed as secondary alternatives, because other good friends and siblings are more important in a person's social network. It can be assumed that primary relationships are a bigger source of rewards and therefore are a bigger threat to the friendship than secondary alternatives, because they are more closely connected into a person's social network. In sum, the hypotheses regarding the alternatives are:

- The greater the number of other friends the greater the friendship erosion and the chance of dissolution (H3a).
- The greater the number of siblings the greater the friendship erosion and the chance of dissolution (H3b).
- The more socially active a person is the greater the friendship erosion and the chance of dissolution (H3c).
- The effect of primary alternatives is greater than the effect of the secondary alternatives (H3d)

2.4.4 Investments, friendship types

The longer people are friends, the more they have invested in the friendships in term of effort and time. According to the fourth basic hypothesis it is to be expected that people will neglect a friendship less when they have invested heavily into that relationship. Assuming that people make their friendships often early in life, age can be a good proxy of the length of a friendship, which also has been confirmed by Kalmijn and Vermunt (2007)[1] and de Jong Gierveld and Dykstra (2006)[2]

[1] Personal data provided by author correlation age and friendship length=0.295 $p<0.000$

[2] correlation age and friendship length=0.230 $p<0.000$

The hypothesis therefore states:

- Older people's friendships experience less erosion and have a smaller chance dissolution than younger people's friendships (H4a)

Besides age the way people have contacted the friend in the past will be used as a proxy for the level of investments. Friendships that have been formed at school, via the partner or other friends and through family are mostly friendships that have been formed early in life. These friendships are often also more close than other friendships. The other friendships consist of friends contacted through work, church, club or society, friends made by going out or at a party and neighbourhood. Work friendships are often functional friendship and are often not multiplex friendship. The other reference friendships are mostly friendship made by opportunity and are therefore no good proxies for friendship length. Hence, friendships that that have been formed at school, via the partner or other friends and through family experience less erosion and has a lower chance of dissolution than those met elsewhere. An additional theoretical argument can be made about partner friends. When people become friends with friends of their partners, the level of investments will be higher because not only the anchor but also the partner has invested in the friendship. Hence, one can speak of double investments. It can also be translated more in terms of Levinger's barrier forces. If both partner and anchor are friends with a person, both have to end the friendship before full contact will be lost. So, a common friendship with the partner can withhold one from not seeing that person.

- Friendships formed at school, or via the partner, through another friend or via the family have a lower probability of erosion and dissolution than the reference group friendships (H4b).

2.4.5 Controls

This study will control for two dyadic characteristics, the mean educational level of the people involved in the friendship and the distance between the two friends. Also the income level of the respondent at wave one is taken as a control measure. Although that homophily in gender is used as a proxy for friendship rewards, the gender composition will as be a control variable in analysis of friendship costs, alternatives and investments. The reason is that besides that similar gender friendship may be more rewarding, gender in it self may also have an effect. Multiple sociological research have proven that gender is a container concept from which a lot of variation in social phenomena can be explained. Hence that gender as "main effect" is used as control variable in the analyses of friendship costs, alternatives and investments. The same will apply to age, age is used as a proxy for friendship

investments, but it also represents a life stage. Therefore in the analysis of friendship rewards, costs, and alternatives the mean age of the friendship will be added to the control variables.

2.5 Conceptual model.

The derived hypotheses are summarised in the conceptual model below.

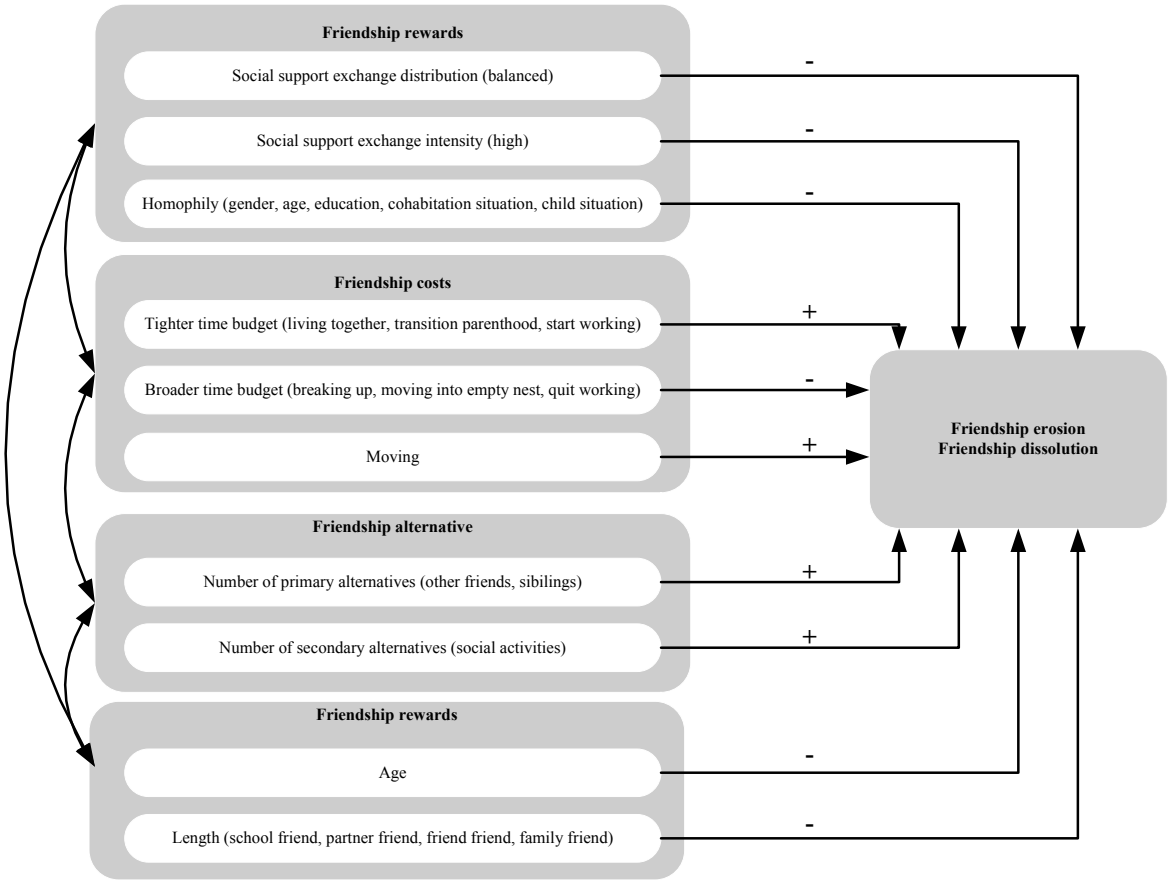

Figure 2.2 Conceptual model

3 Data and Measures

3.1 Data

This study will use the first and second wave of the Netherlands Kinship Panel study (Dykstra, Kalmijn, Knijn, Komter, Liefbroer, Mulder, 2005; Dykstra, Kalmijn, Knijn, Komter, Liefbroer, Mulder, 2007). The first wave was conducted between 2002-2004 and the second wave between 2006-2007. The average time between the waves is three and a half years. The NKPS is a large scale, prospective multi actor longitudinal panel, which focuses mainly on the solidarity relations between family members. In addition to the family relations, questions about the solidarity and contact with a close friend are asked. These data on close friendships will be central in this study. The NKPS includes a main sample, which covers the general population of the Netherlands aged 18 to 79, excluding residents of institutions, nursing homes, old people's homes, and holiday homes, and people without permanent residence status. Besides the main sample, the NKPS also includes a separate migrant sample, which is an over sample of the four largest migrant groups in the Netherlands (Turks, Moroccans, Surinamese and Antilleans) aged 18 to 79. This study will confine itself to the main sample because there was no information collected on non-family members among the migrant sample. The main sample included 8,161 respondents at the first interview. Of those respondents 73.8 percent also participated in the second wave (N=6,026). The non-response was selective; respondents aged 18 to 30 had a greater likelihood of non-response than those aged 31-45. Compared to men, women were less likely to be a non-respondent. Lower educated people and non-church members showed more non-response than higher educated people and church members respectively. Furthermore, urban residents and singles were also more likely to be non-respondents (Dykstra et al. 2007).

For obvious reasons only the people who reported a close friendship at the first interview and who also participated in the second wave were included. Furthermore, no age selection was applied because there is no provable reason why older people cannot maintain fruitful friendships and therefore cannot experience friendship erosion. One of this study's strengths is hence the possibility to investigate friendship erosion and dissolution across a broad age range. After selecting those respondents who reported an important friend in the first interview and who participated in both waves, 5,248 respondents remained in the analysis.

3.2 Erosion, dissolution measure

Respondents were asked at the first interview to name the friends with whom they were in touch regularly and who were important to them. They were allowed to name a maximum of five friends. Of the 8161 respondents who participated in the first wave, 7,189 reported at least named one close friend, this corresponds with 88 percent of the sample. Of those friends one friend was randomly selected, about which more detailed characteristics and data were collected at the first and second wave. At the second interview it was asked whether the respondent knew the person to which the interviewer was referring before further questions were asked about the friend. About one and a half percent of the wave two respondents explicitly answered negatively on this identifying question. A large percentage, 9.7, had a missing value on this question, but this was due to the fact that these respondents did not report a close friend at wave one. One of the characteristics asked was the yearly contact frequency, which was measured on a seven-point scale; never, once, a few times a year, at least monthly, at least weekly, at several times a week, and daily. The contact frequencies at the first and second interview were quantified into number of days of contact a year. Subsequently, the answering categories were recoded into 0, 1, 6, 12, 52, 156, and 365. Erosion was measured as the relative decrease in contact frequency. Therefore the natural log of the contact frequency at wave one and two were calculated and deducted from each other. For mathematical reasons one day was added to the contact frequency.

Friendship dissolution was measured with a dichotomous variable. If the respondent indicated that he did not see the friend in last twelve month at the second interview, the friendship was considered to be dissolved. Almost nine percent of the respondents who answered the contact questions at wave two reported no contact. All respondents reporting a contact frequency of zero at wave two received the value one on the dissolution variable. Table 3.1 shows the initial contact frequency of the 5,248 respondents that are included. Most people saw their friend a least a few times a year. Only two percent of the respondents had only once or no contact at wave one. A good twenty percent of the participants saw their friend a few times a year, almost thirty had monthly contact, and a quarter of the respondents had weekly face to face contact. Fourteen percent saw their friend numerous time a week and almost eight percent of the respondents saw their friend on a daily bases. Overall, it can be said that the contact frequency at the first interview was on average high.

Table 3.1 initial contact frequency at wave one

Contact frequency T1	Frequency	Percentage	Cumulative percentage
Not at all	23	0,44	0,44
Once	76	1,45	1,89
A few times a year	1112	21,19	23,08
At least once a month	1547	29,48	52,57
At least once a week	1358	25,88	78,44
A few times a week	728	13,86	92,30
Daily	404	7,70	100,00
Total	5248	100,00	

3.3 Benefits; support exchange

The exchange of support was used as a proxy for friendship rewards. A distinction was made between emotional and instrumental support. Both the intensity and the balance of the emotional support exchange were constructed. The exchange of emotional support was assessed with six items, equally divided among emotional support given and emotional support received. The items cover interest, advice and the presence at each others birthdays (for the exact questions see Appendix A). Being present at each others birthdays was included in the emotional support measure because it can be viewed as showing interest. For the four items on the exchange of interest and advice, the respondents were able to indicate on a three point scale how often this had happened the last three months; not at all, once or twice, and several times. These items were recoded into dichotomous variables with the value one indicating that it happened at least once the past three months. Logically, being present at the birthday was already measured dichotomously. Subsequently, the amount of emotional support given and the amount of emotional support received were calculated by taking the mean of the three corresponding items. The intensity of the emotional support exchange was measured as the mean value of the amount of emotional support received and emotional support given, creating a variable ranging from zero to one with the value one referring to a high intensity. The balance of the exchange was determined by taking the absolute difference of the amount of support given and the amount of support received.

The instrumental support exchange was constructed similar to the emotional support exchange. Also six questions were posed about the exchange of instrumental support dealing with household work, help with other practical matters (such as chores in and around the house, lending things, transportation, moving things) and financial support received and given (for the exact questions see Appendix A). Help with household work and other practical matters were measured on a three point scale and were recoded into dichotomous variables. The financial support questions could be answered with yes or no. Analogous to the emotional support measurement, the amount of instrumental support given and the amount of instrumental emotional support received were calculated and the intensity of the instrumental support was determined. Finally, the balance was determined by taking the absolute value of the difference score of the amount support given and the amount support received.

Homophily in age and education, were measured by the absolute difference in age and education of the respondent and friend. Education was measured with ten categories covering, incomplete elementary school, elementary school only, lower vocational, lower general secondary, medium general secondary, intermediate vocational, upper general secondary, higher vocational, university, and post-graduate educational level. Gender composition, was measured with three dummy variables indicating whether the persons in the friendship were both male, both female or mixed. In order to investigate the homophily concept, mixed friendships were compared with friendships in which both were male or both female. For both the friend and the respondent a dummy variable was

created, indicating whether they were a parent. To control for similarity of having children the following dummy variable was constructed, if both friend and respondent had children or if both had no children, they received the value one and if only one of them had children the respondent was assigned the value zero. Similar to the control variables for children, a dummy variable was constructed indicating whether the cohabitation situation was similar. If both friend and respondent were in a cohabiting relationship or if both were not, the respondent received the value one and when only one was in a cohabiting relationship the value zero was assigned

3.4 Costs; transitions

Changes in a person's time budget were used to approximate changes in friendship costs. Changes in time budget were in their turn approximated with life course transitions. The transitions that were measured cover cohabitation transitions, transition to parenthood, moving into an empty nest, employment transitions, and moving. For the cohabitation transitions, first the cohabitation status of the respondent at the first and second interview was determined with a dichotomous variable[3]. Next, dummies were created, one indicating if the respondent started living together with his or her partner ,one dummy indicating if the respondent changed from cohabitation to single living, one indication if the respondent was continuously single, and one for those continuously cohabiting. To determine if the respondent made the transition to parenthood, two dichotomous variables indicating if the respondent had a child at home were created for the first and second wave. If the respondent had a child at home in wave two and not in wave one the respondent was considered to have made the transition to parenthood. Inversely, if the respondent had a child at home in the first wave and not any more in wave two the respondent was considered to have made the transition into an empty nest. In addition two dummy variables were computed, one for those who had no children at home at both waves, and one for those who did had children at both waves. It did not matter if the child was a step child, adopted, or an own child. To measure the employment transitions, four dummy variables covering the following situations, unchanged employed, unchanged not working, the transition to employment, and the transition to not working, were created. To analyse the life course transition effects meaningful contrasts were made by switching the reference group. The following contrasts were made:

1. transition to cohabitation versus continuously not cohabiting
2. transition to single living versus continuously cohabiting
3. transition to parenthood versus continuously no children at home
4. transition to empty nest versus continuously children at home
5. transition to employment versus continuously not employed
6. transition to not working versus continuously employed

[3] The marital status at the first and second interview were derived from a variable indicating household type

A dummy variable was created to indicate if the respondent or the respondent's friend moved between the two interviews. If the respondent or the respondent's friend moved since the first interview, the value one was assigned to this respondent.

3.5 Alternatives, primary and secondary

The primary alternatives comprise of the number of other close friendships and number of siblings alive. At the first interview people were asked to list a maximum of five friends. The dataset contains a variable indicating the number of friendships mentioned. This variable minus one was used to measure the number of other friends. The number of siblings alive contains own siblings, step siblings, half siblings and adopted siblings. The number of siblings was measured on a continuous scale, ranging from zero to six. Respondent who had more than six siblings also received the value six to prevent outliers.

The secondary alternatives were defined as the participation in social activities. The data contained questions on eleven different social activities, of which seven covered the membership of clubs or voluntary associations and four cover activities. Exemplary for the items on membership were, sports club membership, trade union membership, and church membership. The activity items covered activities such as, voluntary work at school and unpaid help to sick or handicapped acquaintances or neighbours (for the exact questions see Appendix A). The membership items were dichotomous and the activity items were measured on a four point scale. All variables were recoded into dichotomous variables, with the value one indicating that the activity or membership applied to the respondent. Subsequently, the mean value was calculated and used as the secondary alternative measure. The scale ranges from zero, no participation in any of the social activities, to one, meaning participating in all the social activities.

3.6 Investments

The first proxy to investigate the effect of investments was age. The mean age of the people involved in the friendship was used as a measure. The other proxy to was the origin of the friendship because it was assumed that specific types of friends were made earlier in life and are closer than others. Each respondent was asked where the friend was met. The questionnaire offered ten answering categories; through work, through school, in the neighbourhood, through church, through a sports club, via another club or society, by going out or at a party, through the partner, via friends or acquaintances, or through family. For friendships which were made at school, through family, via the partner and through another friend dummy variables were created. This left friendships contacted through work,

church, club or society, friends made by going out or at a party and neighbourhood friend to be the reference category.

3.7 Controls

Several controls were used to form the baseline. If possible the controls were measured on a dyadic level, this means that both the situation of the respondent and the friend were taken into account. The controls dealt with gender, age, education, and geographical distance. The measures of gender and age are already discussed above. The control variable was measured as the mean education level of the respondent and friend, again the educational level was measured in ten categories. The place of residence of the respondent and the friend is known. Using the zip codes, for both the respondent and the friend X and Y coordinates were derived using the "*Rijksdriehoeksmeting"*. The coordinates have been rounded to hundred meters for privacy reasons, and were provided in kilometres. The geographical distance between the place of residence of the respondent and his of her friend can be calculated using Pythagoras's theorem. Earlier studies showed that the effect of distance was not linear but decreased with greater distances; therefore the distance was measured as the natural log of the distance. No dyadic controls were constructed for the work situation because the work situation of the friend was not available in the data. Furthermore, a variable indicating the household income was created. This variable was truncated at 1,000 euros a year and 60,000 euros a year to avoid outliers.

3.8 Descriptive analysis

Table 3.1 shows the descriptive analysis of the variables, the number of valid cases, the minimum value, maximum value, mean value, and the standard deviation are presented. First of all, the level of erosion varies between -5,209 and 5,903 with a mean value of 0.738. The mean value indicates that overall, people see their friends twice as less at the time of the second interview as during the first interview ($e^{0,738}$). Of the 5,248 friendships examined 467 did not report any contact in wave two, this corresponds with 8.9 percent of the friendships. Concerning the support exchange, it is clear that emotional support is more frequently exchanged than instrumental support. Out of the possible maximum of six emotional support items on average four emotional supports were exchanged. Regarding the instrumental support not even one type of support was exchanged on average. Furthermore, on average, the emotional support exchange was a bite more imbalanced than the instrumental support exchange. However, since the intensity of instrumental support exchange was smaller than the emotional support exchange, it can be said that the friendship in which instrumental support was exchanged were often imbalanced. The absolute difference in age between the two friends was notable, on average five years. Out of the friendships, 36.1 percent were friendships in which both friends were male, in 43.7 percent of the friendships both were female and 20.2 percent of

friendships were mixed. The difference in educational level was on average more than one level. The cohabitation situation differed in 25.7 percent of the friendships, whereas the child situation differed in 22.3 percent of the friendships.

Table 3.2 Descriptives of the dependent variables, friendship rewards, costs, alternatives and investments

Variable	N	Minimum	Maximum	Mean	Standard deviation
Dependent variables					
Erosion	5248	-5,209	5,903	0,738	1,429
Dissolution	5248	0,000	1,000	0,089	0,285
Friendship rewards	5248				
Intensity instrumental support	5248	0,000	1,000	0,114	0,174
Intensity emotional support	5248	0,000	1,000	0,687	0,251
Instrumental support imbalance	5248	0,000	1,000	0,109	0,188
Emotional support imbalance	5248	0,000	1,000	0,165	0,202
Absolute age difference	5248	0,000	71,000	5,227	6,355
Both male	5248	0,000	1,000	0,361	0,480
Both female	5248	0,000	1,000	0,437	0,496
Mixed gender	5248	0,000	1,000	0,202	0,401
Absolute educational difference	5248	0,000	8,000	1,323	1,474
Cohabiting homophily	5248	0,000	1,000	0,743	0,437
Children homophily	5248	0,000	1,000	0,777	0,416
Friendship costs	5248				
Transition to cohabiting	5248	0,000	1,000	0,065	0,246
Transition to single living	5248	0,000	1,000	0,034	0,181
Continuous cohabiting	5248	0,000	1,000	0,686	0,464
Continuous not cohabiting	5248	0,000	1,000	0,215	0,411
Transition to parenthood	5248	0,000	1,000	0,063	0,243
Transition to empty nest	5248	0,000	1,000	0,085	0,279
Continuous children at home	5248	0,000	1,000	0,336	0,472
Continuous no children at home	5248	0,000	1,000	0,516	0,500
Transition to employment	5248	0,000	1,000	0,046	0,208
Transition to not working	5248	0,000	1,000	0,064	0,245
Continuous employed	5248	0,000	1,000	0,628	0,483
Continuous not working	5248	0,000	1,000	0,262	0,440
Moved	5248	0,000	1,000	0,321	0,467
Friendship alternatives					
Number of other close friends	5248	0,000	4,000	2,708	1,357
Number of siblings	5248	0,000	6,000	2,616	1,728
Social activity	5248	0,000	0,909	0,276	0,155
Friendship investments					
Mean age	5248	-26,897	42,603	0,000	14,335
School friend	5248	0,000	1,000	0,189	0,391
Family friend	5248	0,000	1,000	0,038	0,191
Partner friend	5248	0,000	1,000	0,069	0,254
Friend friend	5248	0,000	1,000	0,076	0,266
Dyadic controls	5248				
Mean educational level	5248	1,000	10,000	5,905	1,939
Household income T1	5248	1,000	60,000	22,161	16,718
Ln(Distance T1)	5248	-4,605	5,389	1,053	2,489

Of the respondents, 6.5 percent made the transition to a cohabiting relationship, 3.4 percent became single, 68.6 percent continuously cohabited and 21.5 percent remained single. Between the two interviews, 331 respondents became a parent and 446 moved into an empty nest. One third of the respondents had children at home at both waves and half of the respondents did not have kids at home at the time of both the first and second interview. Regarding the changes in work situation, 4.6 percent became employed, and 6.4 percent quitted or lost their job. Almost two third of the respondents remained employed and 26.2 percent was continuously not working. On average respondents reported almost three other good friends. The mean age ranged from 17 to 86.5 years with a mean of almost 44. The number of siblings varied between zero and six and on average the respondents had two or three siblings. Out of the eleven social activities, people participate in three of them. In addition, of the friendships that were reported, 18,9 percent could be marked as a school friend, only 3.8 was a family fiend, 6.9 percent were friends met through the partner and 7.6 were friend met via other friends. Moreover, on average the people within the friendship attained an intermediate vocational educational level. The household income of the anchor was measured on a scale ranging from 1,000 euros a year to 60,000 euros a year. The average household income was 22.161 euros a year. Finally, the distance varies between 10 meters ($e^{-4.605}$) and to 218 kilometres ($e^{5.389}$).

3.9 Analytic strategy

Because dissolution is a dichotomous variable, a binominal logistic regression method is used to analyse friendship dissolution. Friendship erosion is investigated using an ordinary least square regression method, because the measure of erosion is a logged ratio variable. The measure is logged because, the relative difference in contact frequency is analysed. The change score method is used rather than the regressor variable method, as suggested by Allison (1990) and Johnson (2005). The reason to do this is because there are two conditions under which the regressor method is favoured over the change score method, which both do not apply. The first situation in which the regressor method would be favoured is when the change in the dependent variable is causally dependent on the score at time one. This would mean that the level of erosion would causally depend on the contact frequency during the first interview. Although, the change in contact frequency highly correlates with the contact frequency at the first wave, it is reasonable to assume that the contact frequency at both waves have common causes, for example the quality of the relation or geographical propinquity. Another situation in which the regressor method is favoured over the change score method is when the scores of independent variables are affected by the time specific component of the dependent variable. For example making the transition to parenthood depends on the contact frequency at the first wave. This is also not very likely to be true in this study, hence the choice to use the change score method.

Now that the analytic methods are determined, the analyses of friendship dissolution and friendship erosion are composed of the same steps.

For the analysis of friendship rewards:

1. Baseline model[4]
2. Baseline model[4] plus the support exchange and homophily measurements separately
3. Baseline model[4] plus the support exchange and homophily measurements together

For the analysis of friendship costs:

1. Baseline model[5]
2. Baseline model[5] plus the life course transitions[6] and moving separately
3. Baseline model[5] plus the life course transitions[6] and moving together.

For the analysis of friendship alternatives:

1. Baseline model[7]
2. Baseline model[7] plus number of other friends, number of siblings, and social activity separately
3. Baseline model[7] plus number of other friends, number of siblings, and social activity together

For the analysis of friendship investments:

1. Baseline model[8]
2. Baseline model[8] plus the support exchange and homophily measurements separately
3. Baseline model[8] plus the support

[4] Baseline model includes mean age, mean educational level, household income T1, and initial distance
[5] Baseline model includes mean age, gender composition, mean educational level, household income T1, and initial distance
[6] The described contrasts in 3,4 are made by switching reference category
[7] Baseline model includes mean age, gender composition, mean educational level, household income T1, and initial distance
[8] Baseline model includes gender composition, mean educational level, household income T1, and initial distance

4 Results

4.1 Baseline models

Table 4.1 presents the baseline models for friendship erosion and friendship dissolution. The baseline models control for dyadic friendship characteristics and show some interesting findings. First of all, older people experience less friendship erosion and have a smaller chance of ending the friendship than younger people. The negative effect of age on erosion is not linear but curvelinear showing a more negative effect for friendships with a lower age than for older age friendships. The implications of finding will be discussed in the section on friendship investments.

Table 4.1 Baseline models for friendship erosion and friendship dissolution. Unstandardised regression coefficients and standard errors of the regression of friendship erosion and dissolution on the all baseline variables.

	Friendship erosion **B (OLS)** (s.e)	Friendship dissolution **B (logit)** (s.e)
Constant	1,062***	-1,434***
	(0,071)	(0,182)
Mean age	-0,025***	-0,028***
	(0,001)	(0,004)
Mean age^2 (x1000)	0,267***	-0,510*
	(0,088)	(0,246)
Both male versus both female[9]	0,023	-0,313***
	(0,043)	(0,116)
Mean educational level	-0,044***	-0,111***
	(0,011)	(0,028)
Household income T1	-0,005***	-0,016***
	(0,001)	(0,003)
Distance T1	-0,046***	0,142***
	(0,008)	(0,023)
N	5248	5248
(Nagelkerke) R^2	0,068	0,061
-2 log likelihood		3003,396

*p<0.05 **p<0.01 ***p<0.001 (one tailed)

Comparing male-male friendships with female-female friendships reveals conflicting results, on the one hand female-female friendships do not endure more erosion than male-male friendships, but they do have a bigger chance of being ended. This may indicate that while men and women are equally good at maintaining friendships, women more often switch friends. Furthermore, higher educated friendships endure less erosion and have a smaller chance of being ended. Money plays a significant role in explaining erosion and friendship dissolution; higher income levels are associated with less

[9] Category mixed gender is estimated in model but is not presented in baseline model. Mixed gender will be discussed as part of homophily concept (table 4.2 and 4.3)

erosion and a smaller chance of dissolution. Finally, if the distance between the two friends is bigger the erosion is less but the change of ending the friendships is greater. The negative effect of distance on erosion may be explained by a negative correlation between distance and the contact frequency at time one[10]. In other words, long distance friendships have a lower contact frequency during the first interview and are therefore less susceptible to erosion.

4.2 Friendship rewards, support exchange

Table 4.2 shows the regression analysis of friendship erosion on friendship rewards after controlling for the baseline variables, for the full table with baseline variables see Appendix B1.

Table 4.2 Unstandardised regression coefficients and standard errors of the OLS regression of friendship erosion on friendship rewards controlling for baseline variables

	Model 1 **B (OLS)** (s.e)	Model 2 **B (OLS)** (s.e)	Model 3 **B (OLS)** (s.e)	Model 4 **B (OLS)** (s.e)
Constant	1,138***	1,039***	1,063***	1,050***
	(0,085)	(0,072)	(0,101)	(0,116)
Support Exchange				
Intensity instrumental support	0,758***			0,659***
	(0,119)			(0,136)
Intensity emotional support	-0,216**			-0,169*
	(0,082)			(0,085)
Instrumental support balance		0,382***		0,081
		(0,102)		(0,119)
Emotional support balance		0,062		0,034
		(0,094)		(0,096)
Homophily				
Absolute age difference			0,019***	0,018***
			(0,003)	(0,003)
Both male [a]			-0,104*	-0,106*
			(0,053)	(0,053)
Both female [a]			-0,133**	-0,101*
			(0,052)	(0,052)
Absolute educational difference			-0,007	-0,009
			(0,013)	(0,013)
Cohabiting homophily			-0,085*	-0,069
			(0,045)	(0,045)
Children homophily			0,065	0,065
			(0,047)	(0,047)
N	5248	5248	5248	5248
R^2	0,073	0,069	0,074	0,080

*p<0.05 **p<0.01 ***p<0.001 (one tailed)
[a] Reference category: mixed gender

As expected, the more emotional support is exchanged at the time of the first interview the lower the erosion. On the contrary, higher levels of instrumental support are significantly associated with higher

[10] correlation distance and Ln(contactT1) = 0.478 , p<0.000

levels of erosion, which is not in line with the hypothesis. Furthermore, after controlling for the baseline, the stronger a friendship is imbalanced in terms of instrumental support the higher the level of erosion, this supports hypothesis 1a. The distribution of emotional support exchange on the other hand does not affect the level of erosion. Entering the intensity and distribution of the exchange of instrumental and emotional support into one model (Model 3 table 4.2) reveals that it is predominantly the intensity of the support exchanged, which affects the level of erosion. High instrumental support and low emotional support intensity lead toward higher levels of erosion. The distribution of the instrumental support exchange becomes insignificant. This is due to the fact that the distribution of instrumental support in friendships with a high intensity of instrumental support is almost always imbalanced. In other words, balanced friendships with a high intensity of instrumental support rarely exist.

The logistic regression analysis of friendship dissolution on the exchange (table 4.3) shows that a high intensity of emotional support decreases the chance of friendship dissolution.

Table 4.3 Unstandardised regression coefficients and standard errors of the logistic regression of friendship dissolution on friendship rewards controlling for baseline variables,

	Model 1 **B (logit)** (s.e)	Model 2 **B (logit)** (s.e)	Model 3 **B (logit)** (s.e)	Model 4 **B (logit)** (s.e)
Constant	-0,837***	-1,633***	-1,586***	-1,006***
	(0,208)	(0,185)	(0,260)	(0,293)
Support Exchange				
Intensity instrumental support	0,178			-0,173
	(0,305)			(0,372)
Intensity emotional support	-1,130***			-1,219***
	(0,207)			(0,217)
Instrumental support balance		0,366		0,706*
		(0,251)		(0,305)
Emotional support balance		0,473*		0,220
		(0,238)		(0,242)
Homophily				
Absolute age difference			0,027***	0,023***
			(0,008)	(0,008)
Both male [a]			-0,381**	-0,380**
			(0,138)	(0,139)
Both female [a]			-0,067	0,036
			(0,127)	(0,129)
Absolute educational difference			0,008	0,008
			(0,034)	(0,034)
Cohabiting homophily			-0,074	-0,063
			(0,113)	(0,114)
Children homophily			0,020	0,031
			(0,123)	(0,123)
N	5248	5248	5248	5248
Nagelkerke R^2	0,069	0,059	0,067	0,083
-2 log likelihood	2985,387	3009,544	2989,725	2951,295

*p<0.05 **p<0.01 ***p<0.001 (one tailed)
[a] Reference category: mixed gender

An imbalanced distribution of instrumental support increases the chance of friendship dissolution, supporting the hypothesis. The initially bivariate effect of the distribution of emotional support disappears when the intensity and distribution of emotional support are entered into one model. In sum, the distribution of emotional support does not affect the level of erosion and the chance of friendship dissolution. On the contrary the intensity does, indicating that both giving and receiving emotional support is satisfying in a friendship. The exchange of instrumental support affects friendship erosion and dissolution in a more complex way, higher levels of intensity lead to higher levels of erosion, whereas the actual imbalance causes a higher dissolution chance, the latter is in line with the hypothesis, the former is not. Maybe, high intensity friendships are less informal and require more commitment and therefore are experienced as more suffocating, which could lead to higher levels of erosion. The imbalance of instrumental support exchange may be a reason to end these "stressful" friendships.

Do similar friendships endure less erosion and do they have a smaller chance of being ended? Table 4.2 model four shows that when the absolute age difference is bigger a friendship endures higher levels of erosion than when the absolute age difference is smaller. Homophily in gender is associated with lower levels of erosion. Both finding are in line with the homophily hypothesis. On the contrary, homophily in education, cohabitation situation, and child situation do not affect the level of erosion. The analysis of friendship dissolution (table 4.3) shows similar results. Homophily in age is associated with a smaller dissolution chance. Again similarity in education, cohabitation situation, and child situation do not affect the level of erosion. The exception is similarity in gender; male-male friendships have a smaller chance of being ended compared to mixed friendships, which is as expected. Female-female friendships on the other hand do not have a smaller chance of dissolution. This may indicate that that while men and women are equally good at maintaining friendships, women more often switch friends. Overall, the homophily argument receives mixed support; five out the possible twelve results are in line with the hypothesis.

4.3 Friendship costs, transitions

Tables 4.4 and 4.5 show the effects of the life course transitions and moving on friendship erosion and dissolution. For the full models see appendix B2. First, do changes in a person's time budget affect the level of erosion? Table 4.4 reveals that the transition to cohabitation causes higher levels of erosion. Also the transition to employment is associated with higher levels of erosion. People who start living together experience almost 39 percent ($e^{0.329}$) more erosion than those who remained single. For the people who start working the level of erosion is 36 percent higher compared to people who remained without work between the two interviews. These two finding are in line with hypothesis 2a. Opposite to what is expected, people who become a parent endure less erosion compared to those who remain childless. However this effect becomes insignificant after we enter all transitions, especially

the cohabitation transitions, into one model. Most of the people who become a parent are cohabiting at both wave one and two, and the continuously cohabiting people have more stable friendships.

Table 4.4 Unstandardised regression coefficients and standard errors of the regression OLS regression of friendship erosion on friendship costs controlling for baseline variables.

	Model 1 **B (OLS)** (s.e)	Model 2 **B (OLS)** (s.e)	Model 3 **B (OLS)** (s.e)	Model 4 **B (OLS)** (s.e)	Model 5 **B (OLS)** (s.e)	Model 6 **B (OLS)** (s.e)
Transition to cohabiting vs. continued single living	0,321***					0,258**
	(0,087)					(0,087)
Transition to single living vs. continued cohabiting	0,027					-0,072
	(0,105)					(0,109)
Transition to parenthood vs. continued no children at home		-0,199**				-0,121
		(0,084)				(0,085)
Moving into empty nest vs. continued children at home		0,187**				0,046
		(0,074)				(0,077)
Transition to employment vs. continued unemployed			0,276**			0,316***
			(0,104)			(0,093)
Transition to unemployment vs. continued employed			0,137*			0,043
			(0,081)			(0,087)
Moved				0,354***	0,543***	0,523***
				(0,044)	(0,048)	(0,049)
Moved X distance					-0,152***	-0,147***
					(0,017)	(0,017)
N	5248	5248	5248	5248	5248	5248
R^2	0,081	0,070	0,070	0,079	0,093	0,106

Constant not reported due to switching reference category
*p<0.05 **p<0.01 ***p<0.001 (one tailed)

Furthermore, table 4.4 reveals that breaking up, that is making the transition to single living, does not affect the level of erosion. Also quitting or losing a job does not significantly affect the level of erosion. In addition, people moving into an empty nest experience higher levels of erosion, but this effect does not hold after controlling for the other transitions. Overall, the results of the life course transitions on friendship erosion do not ambiguously confirm the cost hypothesis; the two out of three results are as expected. However, the life course transitions creating a broader time budget do not follow the costs hypothesis. It might be that, breaking up on the one hand creates more time for friends but it also can create stress because the friend may have to choose between the partner and the anchor, due to loyalty conflicts. A similar mechanism may also play a role when people stop working. On the one hand the time budget becomes broader but on the other hand they lose social contacts and are less socially embedded.

What about the effect of moving? It is clear that moving has a positive effect on the level of erosion, friendships in which one or both friends have moved since the first interview endure more than twice as much erosion than when both have not moved. The hypothesis states that moving further apart is associated with higher levels of erosion. To investigate this, the interaction of moving with the

distance at the first interview was estimated[11]. The assumption is that the chance of moving further apart is greater when people initially live close to each other. Table 4.4 shows that indeed moving had a stronger impact on the erosion level when people live close to each other. The interaction is drawn in figure 4.1.

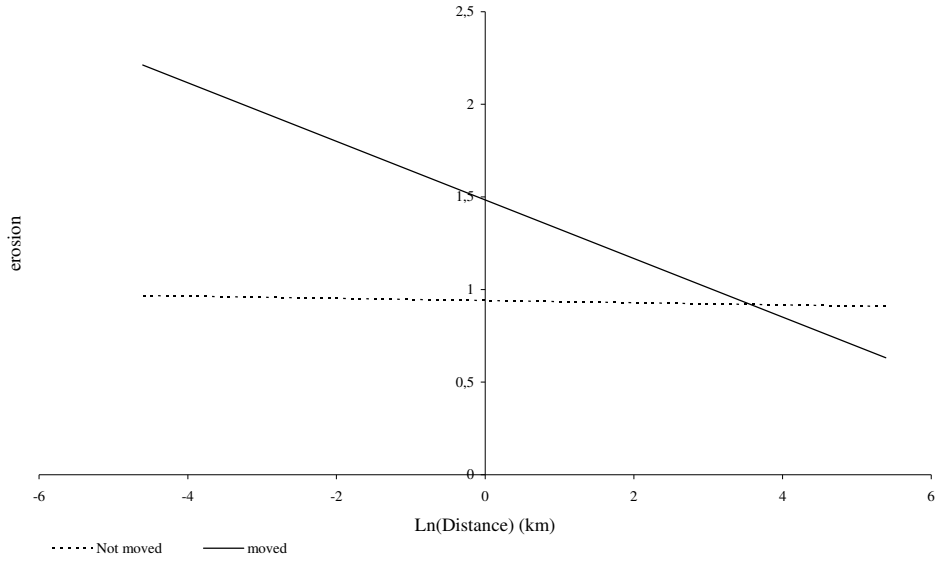

Figure 4.1 Erosion of people moved and not moved by distance

Figure 4.1 reveals that for those who have not moved the level of erosion is hardly affected by the initial distance whereas the level of erosion experienced by those who have moved is highly dependent on the initial distance. The crossing point of the two lines lies around 3.6, which corresponds with a distance of 36,6 kilometres ($e^{3.6}$). Thus, when two friends initially live around 36 kilometres or more from each other moving leads to lower levels of erosion than remain living at the same distance.

Do the transitions and moving affect the chance of ending a friendship? Table 4.5 shows the results of the logistic regression analysis of friendship dissolution on the different transitions. These results are very similar to the erosion analysis. Comparable with friendship erosion, the transitions to a tighter time budget reasonably follow the cost hypothesis. The transition to cohabitation and employment cause a bigger chance of dissolution than respectively continuously single living and continuously not working. The transition to parenthood again did not significantly affect the chance of friendship dissolution. Transitions to a broader time budget do no lead to smaller dissolution chances.

At first, moving into an empty nest seems to increase the chance of friendship termination, but the effect turns insignificantly after entering the cohabitation transitions. This may be due to the fact that some people move into an empty because they break up. Stop working also does not affect friendship dissolution. Different from the analysis of erosion, the transition to single living increases the chance of ending the friendship. The chance of ending a friendship is twice as big for people who

[11] interaction with initial distance and moving investigated due to missing data on place of resident of moved friends

break up than for people who continue to live together ($e^{0,709}$). This may be due to the earlier mentioned possible conflicting loyalties. The effect decreases slightly after entering all transitions into the model but remains significantly. The effect of moving on friendship dissolution is similar to the effect of moving on friendship erosion. The chance of ending a friendship is bigger when one or both friends moved and the effect is again mediated by the initial distance; moving has a greater impact when people initially live close to each other than when people lived at bigger distances.

Table 4.5 Unstandardised regression coefficients and standard errors of the logistic regression of friendship dissolution on friendship costs controlling for baseline variables

	Model 1 **B (logit)** (s.e)	Model 2 **B (logit)** (s.e)	Model 3 **B (logit)** (s.e)	Model 4 **B (logit)** (s.e)	Model 5 **B (logit)** (s.e)	Model 6 **B (logit)** (s.e)
Transition to cohabiting vs. continued single living	0,347*					0,278*
	(0,174)					(0,177)
Transition to single living vs. continued cohabiting	0,709**					0,477*
	(0,237)					(0,257)
Transition to parenthood vs. continued no children at home		-0,327				-0,201
		(0,220)				(0,229)
Moving into empty nest vs. continued children at home		0,589***				0,275
		(0,175)				(0,196)
Transition to employment vs. continued unemployed			0,348			0,459**
			(0,220)			(0,195)
Transition to unemployment vs. continued employed			0,344*			0,173
			(0,194)			(0,218)
Moved				0,422***	0,755***	0,722***
				(0,109)	(0,131)	(0,133)
Moved X distance					-0,204***	-0,200***
					(0,045)	(0,046)
N	5248	5248	5248	5248	5248	5248
Nagelkerke R^2	0,074	0,067	0,064	0,067	0,076	0,090
-2 log likelihood	2973,480	2990,255	2996,234	2988,494	2968,368	2932,035

Constant not reported due to switching reference category
*p<0.05 **p<0.01 ***p<0.001 (one tailed)

To investigate the effects of the transitions further, interactions of the transitions with the mean age are computed. The reason why the interactions are estimated is twofold. One, by computing the interaction of the transition to single living with age it is possible to investigate the conflicting loyalties argument further. In other words does a break up lead to higher level of erosion and a bigger chance of dissolution among older people than among younger people? Secondly, more generally, by computing the interactions of the live course transitions with age it is possible to investigate whether older age friendships are less sensitive towards outward 'shocks'. This would also provide a more extensive test of the investment argument, for age can, as already theoretical grounded in chapter two, be a proxy of amount of investments made.

The significant interactions are drawn, for the full model see appendix B2. First, the interaction of the transition to cohabitation with age on erosion is examined. Figure 4.2 shows the

interaction. The interaction is not extrapolated to the full age range but it is only drawn for that range that covers the lower 90 percent of those who made the transition.

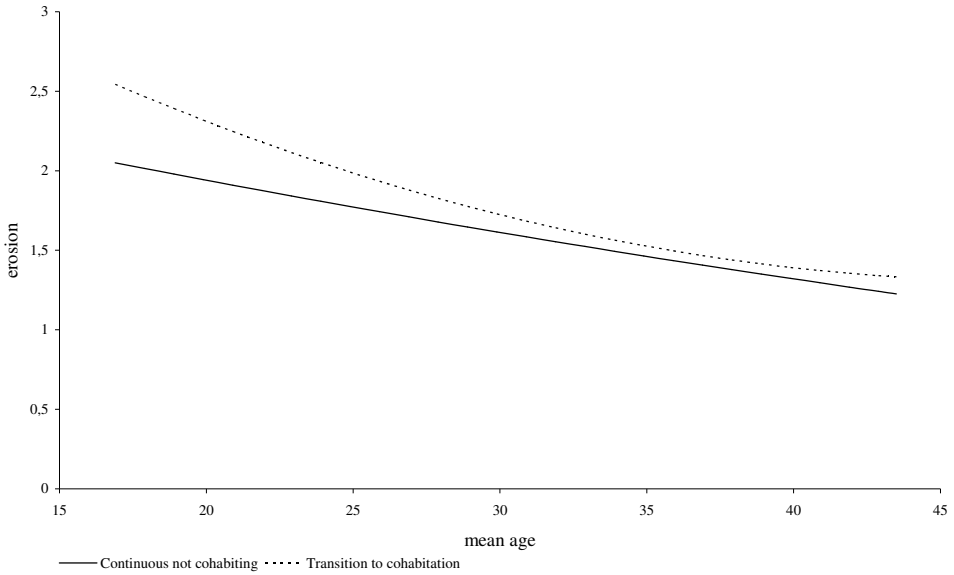

Figure 4.2 Erosion of people who made transition to cohabitation and continuously non cohabiting

Figure 4.2 reveals several things. First, people making the transition towards a cohabiting relationship always experience higher levels of erosion than those who remain single, irrespectively of age. This supports the cost hypothesis. Furthermore, figure 4.2 also shows that the effect of the transition to cohabitation decreases with age. In other words, for people who make the transition at an older age the transition towards a cohabiting relationship is not as big of a shock as for people who make the transition at younger ages. Assuming that friends are made early in life this means that older friendships are less sensitive to outward 'shocks' than younger ones. The fact that older friendships are more stable may be due to higher levels of investments. In short, the decreasing effect of the transition to cohabitation with age may be due to higher levels of investments in older friendships.

Figure 4.3 shows the mediating effect of age on the effect of becoming single on the level of erosion. As with the transition to cohabitation, the interaction is only drawn for that age range that covers the lower 90 percent of those who made the transition. Figure 4.3 reveals that at young ages the level of erosion among those becoming single is smaller than among those who are continuously cohabiting. This supports the costs hypothesis; the time budget becomes broader when a cohabiting relationships ends, which leads to lower levels of erosion. However, from around early thirty to around mid sixty, people who become single experience more erosion than those remaining in a cohabiting relationship. This finding supports the conflicting loyalties argument. When a friendship lasts longer, investments in that friendship becomes higher not only by the anchor but also by the partner. This argument is supported by Kalmijn (2003), who found that friendship networks of cohabiting partners become increasing overlapping when people get older. This investment of the partner in the anchor

friend may cause conflicting loyalties when the cohabiting relationship ends causing higher levels of erosion when breaking up than when people remain continuously cohabiting. The friend, partner and anchor may experience feelings of being torn between the other people involved in this triad. After around the age of 65 the levels of erosion are again lower for people making the transition than for people continuously cohabiting, this might be explained by the fact that people who became involuntary single (widowed) are also take up in the measurement of the transition to single living. Therefore, it might be that older people who become widowed turn to their friend for support and are not hampered by possible conflicting loyalties.

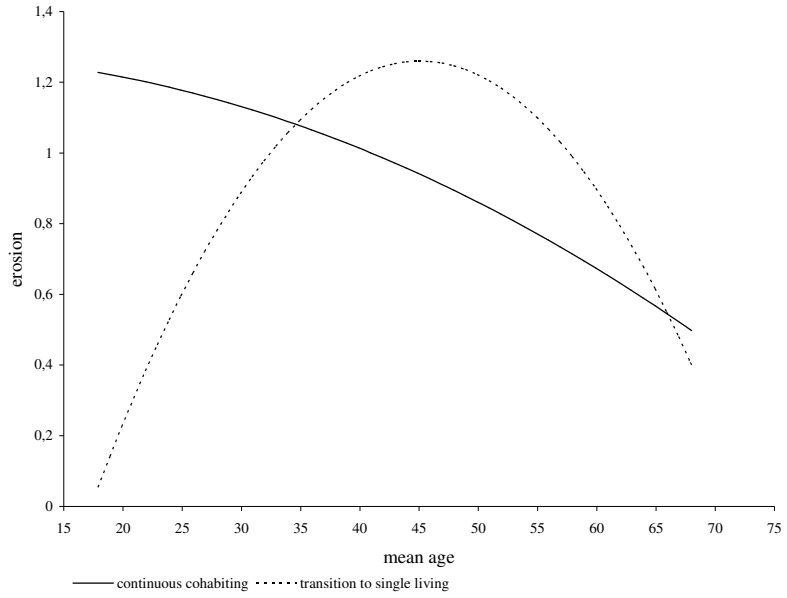

Figure 4.3 Erosion of people who made transition to single living and continuously cohabiting

A similar result appears when the interaction of the transition to single living with age on friendship dissolution is computed. The chance of ending a friendship is smaller for young people who break up than for young people who remain living together with their partner. Between the age of 27-60 the chance of ending a friendship is greater for those who start living on their own again than for those who remain with their partner. Finally, for older people the chance of ending a friendship is smaller when they become single living than when they remain in a cohabiting relation.

The interaction of age on the effect of the transition to parenthood on friendship erosion is drawn in figure 4.4. Again the interaction is drawn for the lower 90 percent age range. Figure 4.4 shows that at younger ages the effect of the transition to parenthood is more negative than for older ages[12]. This result is in contrast with what is expected. Fist of all, the effect of becoming a parent on erosion is expected to be positive but figure 4.4 clearly shows that the overall effect is negative.

[12] Estimating the effect of the transition to parenthood with a selectivity check (only estimating the interaction for people below fifty) reveals a similar result. Although that the effect sizes differ slightly the effect of the transition to parenthood is negative and converges with age.

Secondly, the converging effect with an increase in age does not support an investment argument. Following the investment argument (more has been invested in older friendships) one would expect the effect not to converge with age. The above finding should be approached with caution since the main effect of the transition to parenthood is not significant in the model with all transitions (see model 6 table 4.4). This is mainly due to the entering of the cohabitation transitions into the model. Most people who become a parent are in a continuously cohabiting relation, which experiences the lowest levels of erosion of all cohabitation situations.

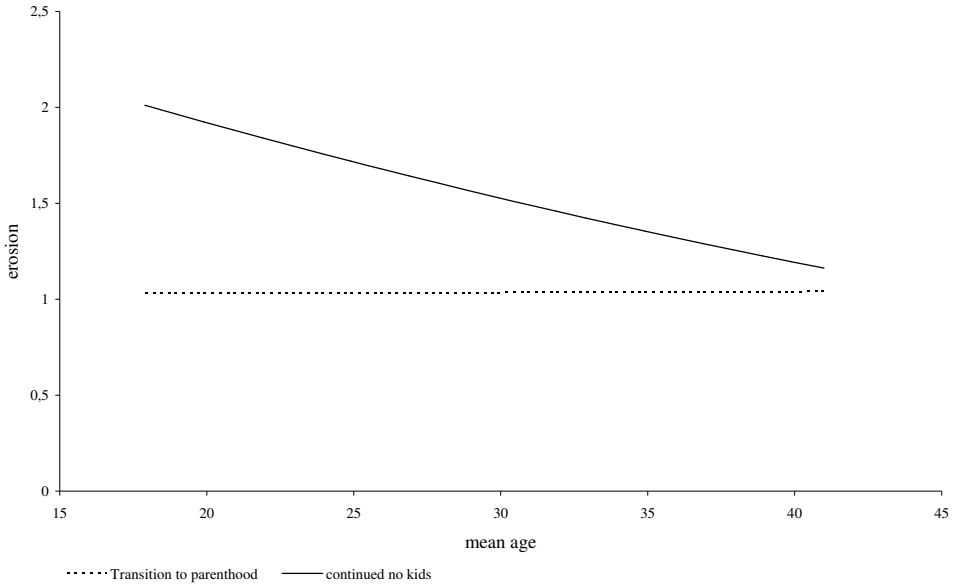

Figure 4.4 Erosion of people who made transition to parenthood and continuously lived with no children

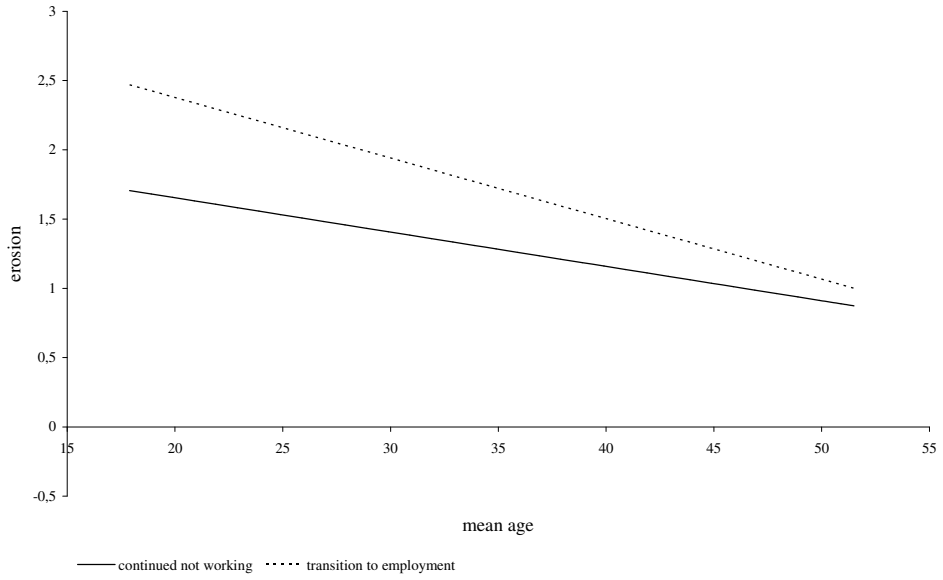

Figure 4.5 Erosion of people who made transition to employment and continuously not working

Figure 4.5 shows the interaction of age with the transition to employment for the lower 90 percent age range. Making the transition to employment at early ages affects a friendship more negatively than at older ages. This supports the idea that older friendships (assuming that friendships are made early in life) are more robust against life course changes because more has been invested in them. The results of the interaction of age with the transition to employment on friendship dissolution are similar to the analysis of friendship erosion, the chance of ending a friendship is greater when making the transition to employment for younger ages than for older ages The interactions of age with the transition to not working on erosion or dissolution are not significant, indicating that the effect of the transition to employment is not reversible.

The above interactions of age with various life course transitions on friendship erosion and dissolution lead to the following overall findings. The effects of the transitions to a tighter time budget seem to be mediated by investments; the transitions to cohabitation and to employment have a smaller (less positive) effect on erosion and dissolution when people are older. The transition to parenthood is the exception. The transitions to a broader time budget are not associated with lower levels of erosion and a smaller chance of friendship dissolution and were in general not mediated by age. Only the effect of the transition to single living is mediated by age, at young ages breaking up causes less erosion than remain single living, whereas becoming single between mid thirty and mid sixty causes more erosion and dissolution than remain single living. This supports the idea that the transitions to a tighter time budget are not reversible because a mechanism of conflicting loyalties may balance out the effect of having more time. The concept of investments can play a role in the transition to single living, but the investment is not made by the anchor but by the partner. Hence, one can cautiously say that investments mediate the effects of several life course transitions.

4.4 Friendship alternatives, other close friends, siblings and social activity

Does the number of possible alternatives influence the level of friendship erosion and friendship dissolution? Table 4.6 shows the results of the OLS regression of friendship erosion on friendship alternatives after controlling for the baseline variables (for the full model see appendix B3). First of all, the number of siblings affects friendship erosion in the expected way, the more siblings a person has the more the friendship is eroded at the time of the second interview. This supports the hypothesis that siblings can act as an alternative to a friendship. People who have six siblings experience twelve percent more erosion than people who have no siblings ($e^{6 \times 0,019}$). This effect becomes borderline significant when entering all alternatives measures. The number of other friends significantly influences the level of erosion. Surprisingly, the more other friends one has the lower the erosion. A possible explanation for this unexpected finding is that people who have more close friends are more sociable and therefore are better at maintaining friendships than people who have only one close

friend. The maximum effect is $e^{4 \times -0.027} = 0{,}90$ indicating that that the erosion is ten percent less for people who have four other close friends compared to people who reported only one close friend.

Table 4.6 Unstandardised regression coefficients and standard errors of the OLS regression of friendship erosion on friendship alternatives controlling for baseline variables

	Model 1 **B (OLS)** (s.e)	Model 2 **B (OLS)** (s.e)	Model 3 **B (OLS)** (s.e)	Model 4 **B (OLS)** (s.e)
Constant	1,111***	0,996***	1,081***	1,060***
	(0,076)	(0,081)	(0,075)	(0,089)
Primary friendship alternatives				
Number of other close friend	-0,025*			-0,023†
	(0,014)			(0,014)
Number of siblings		0,019*		0,019†
		(0,011)		(0,011)
Secondary friendship alternatives				
Social activities			-0,095	-0,090
			(0,127)	(0,127)
N	5248	5248	5248	5248
R^2	0,068	0,068	0,068	0,068

*p<0.05 **p<0.01 ***p<0.001 † = borderline significant (one tailed)

Furthermore, people who are socially more active experience the same level of erosion as those people who are less active. On the other hand, people who are more socially active have a significantly smaller chance of ending the friendship than those less active. This may be due to the fact that active people more easily meet with their friends than those not socially active. Opposite to friendship erosion, the chance of dissolution is not affected by the number of other friends and siblings (see table 4.7).

In all, the hypotheses concerning the friendship alternatives, receive little support. Only the number of siblings affects friendship erosion in the expected way. People with more friends experience less erosion and those more socially active have a smaller chance of ending a friendship. The latter, indicating that having more alternatives is more an advantage than a disadvantage for a friendship because people are more socially embedded. Obviously the hypothesis that secondary alternatives have a smaller effect on friend erosion and dissolution than primary alternatives is automatically rejected because the main effects of the primary and secondary alternatives are not as expected. The conclusion on the friendship alternatives has to be nuanced; the transition to cohabitation has a significant positive effect on the level of erosion and dissolution (see table 4.4. and 4.5). While this finding has been explained in terms of an increase in costs, it also can be explained in terms of alternatives. The partner can act as an alternative to a friendship. Taking this into account the concept alternatives receives some support.

Table 4.7 Unstandardised regression coefficients and standard errors of the logistic regression of friendship dissolution on friendship alternatives controlling for baseline variables

	Model 12 **B (logit)** (s.e)	Model 2 **B (logit)** (s.e)	Model 3 **B (logit)** (s.e)	Model 4 **B (logit)** (s.e)
Constant	-1,427***	-1,543***	-1,189***	-1,325***
	(0,195)	(0,212)	(0,192)	(0,231)
Primary friendship alternatives				
Number of other close friend	-0,003			0,008
	(0,037)			(0,037)
Number of siblings		0,031		0,035
		(0,030)		(0,030)
Secondary friendship alternatives				
Social activities			-1,329***	-1,344***
			(0,347)	(0,347)
N	5248	5248	5248	5248
Nagelkerke R^2	0,061	0,062	0,068	0,068
-2 log likelihood	3003,388	3002,338	2988,214	2986,864

*p<0.05 **p<0.01 ***p<0.001 (one tailed)

4.5 Friendship investments; type of friendships

Do older people's friendships endure less erosion? As already mentioned in the first paragraph of this chapter and as can been seen in table 4.8, the older people are the less friendship erosion they experience. Table 4.9 shows that age is also negatively related with friendship dissolution. These findings are in line with hypothesis 4a. The type of friendship is also used as proxy for friendship investments. The assumption is that friendships made at school, through family, friends and a partner are made earlier in life and are the closest friendships. Table 4.8 shows that three of these four types of friendship experience less erosion than the reference category existing of friends made at work, at a club, at church, by going out, and neighbours, supporting hypothesis 4b. The negative effect of partner friends supports the double investment argument. This argument may also play a role in family friends; the extra investment is made by a family member instead of the partner. Only friendships met via other friends endure similar levels of erosion than the reference category. The effect of school friends is interestingly not significant when age is not included in the model. This may be explained by the fact that school friends are relatively more reported by young people[13]. Entering age in a model with school friends filters out the inferring effect of age on the effect of school friend. This may indicate that if people are still friends with each other after some time when left school they endure less erosion, supporting the investment argument. Results of the logistic regression analysis of

[13] Mean age school friends = 36.4, non school friend=45.6 F= 3512.00 p<0.000

friendship dissolution on the different types of friendships show that only the school friend has a significantly smaller chance of being ended than the reference group.

Table 4.8 Unstandardised regression coefficients and standard errors of the OLS regression of friendship erosion on friendship investments controlling for baseline variables

	Model 1 **B (OLS)** (s.e)	Model 2 **B (OLS)** (s.e)	Model 3 **B (OLS)** (s.e)
Constant	1,062***	1,019***	1,108***
	(0,071)	(0,067)	(0,072)
Mean age	-0,025***		-0,026***
	(0,001)		(0,001)
Mean age^2 (x1000)	0,267**		0,302***
	(0,088)		(0,088)
School friend[a]		0,066	-0,176***
		(0,053)	(0,054)
Family friend[a]		-0,255**	-0,222*
		(0,104)	(0,101)
Partner friend[a]		-0,235**	-0,273***
		(0,080)	(0,078)
Friend friend[a]		0,026	-0,111
		(0,076)	(0,074)
N	5248	5248	5248
R^2	0,068	0,013	0,071

*p<0.05 **p<0.01 ***p<0.001 (one tailed)

[a] Reference category: work, church, club or society, party, and neighbourhood friends

Table 4.9 Unstandardised regression coefficients and standard errors of the logistic regression of friendship dissolution on friendship investments controlling for baseline variables

	Model 1 **B (logit)** (s.e)	Model 2 **B (logit)** (s.e)	Model 3 **B (logit)** (s.e)
Constant	-1,434***	-1,735***	-1,407***
	(0,182)	(0,161)	(0,186)
Mean age	-0,028***		-0,030***
	(0,004)		(0,004)
Mean age^2 (x1000)	-0,510*		-0,430*
	(0,246)		(0,248)
School friend[a]		-0,094	-0,326**
		(0,133)	(0,139)
Family friend[a]		-0,065	0,009
		(0,253)	(0,254)
Partner friend[a]		-0,234	-0,259
		(0,204)	(0,205)
Friend friend[a]		0,072	-0,072
		(0,175)	(0,178)
N	5248	5248	5248
Nagelkerke R^2	0,061	0,036	0,064
-2 log likelihood	3003,396	3063,627	2996,640

*p<0.05 **p<0.01 ***p<0.001 (one tailed)

[a] Reference category: work, church, club or society, party, and neighbourhood friends

To investigate the effect of school friends further a model with the interaction of the type of friendship with age was estimated. Figure 4.6 shows that the erosion experience by school friendships first decreases with age and later increases with age. Comparing the school friendships with the reference group shows that at early ages school friends experience higher level of erosion (up to mid twenty). Between the age of 25 and 65 school friendships endure less erosion than the reference category and after the mid sixty the erosion level of school friendships are again higher.

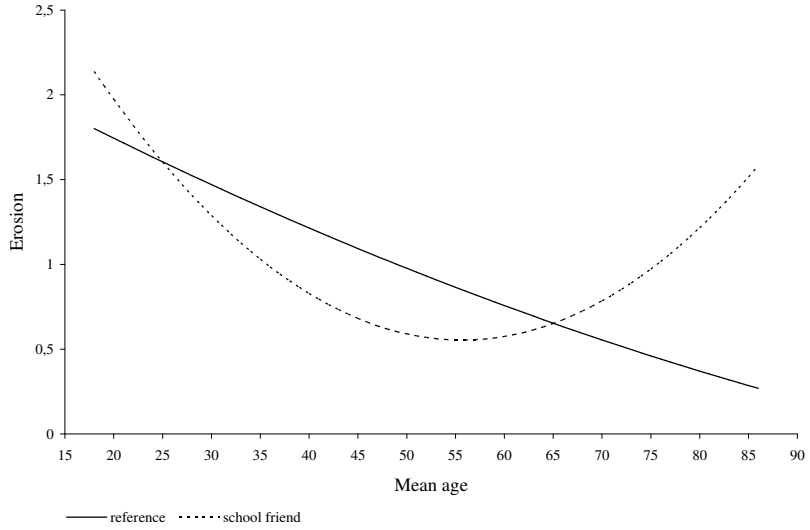

Figure 4.6 Erosion of school friendships and reference group friendships by mean age

This support the suggestion, made earlier, that after surviving the first few years after leaving school, school friends are more stable than non school friendships. This in its turn supports the idea that school friends are friendships in which there has been invested and in which people share a lot of common experiences. Still puzzling are the higher levels of erosion after people reach mid sixty. Possibly because the distance between school friends is bigger than non school friend[14] people will cut down on seeing the school friend first when they get older because a decrease in mobility. This may also be a reason why school friendships have a greater chance of ending than the reference group when people are older than 55 years The interaction of school friendships with age on friendship dissolution reveals that at first school friendships have a smaller chance of dissolution than the reference group whereas after the age of 55 the chance is bigger. Overall, the effects of age, school friendships (main effect and interaction), partner friendships, and family friendships confirm the idea that friendships are more stable when more has been invested in them.

[14] Mean distance school friends = 26.2 Km, non school friend=15.7 Km F= 77.80 p<0.000

5 Conclusion and discussion

This study set out to investigate friendship erosion and dissolution from a perspective on marital dissolution, using two wave longitudinal data from the Netherlands Kinship Panel study (Dykstra, Kalmijn, Knijn, Komter, Liefbroer, Mulder, 2005; Dykstra, Kalmijn, Knijn, Komter, Liefbroer, Mulder, 2007). Before doing so, the existing perspectives on marital dissolution had to be brought together and forged into one comprehensive view on marital dissolution. Reviewing, Becker, Landes, and Michael's analysis of marital instability (1977), Levinger's perspective on marital dissolution (1965, 1979), and Rusbult's Investment Model (1980a) led to the formulation of the following comprehensive view on marital dissolution; the probability of dissolution depends on (a) the amount of rewards, (b) the amount of costs, (c) the level of alternatives, and (d) investment size. This comprehensive view was applied on friendship erosion and friendship dissolution, which led to four research questions paralleling the four components. This chapter will start by summing up the main findings on each of the research questions and corresponding hypotheses. Sequentially, some limitations will be discussed and a relation to earlier research will be made. Before a general answer to the central research question is formulated, several suggestions for further research will be discussed.

5.1 Main conclusions

Before discussing the main results of the analysis of friendship rewards, costs, alternatives and investments, the extent of friendship erosion and dissolution is discussed. The descriptive analyses revealed that some friendships eroded from daily to no contact, whereas others strengthened from once a year to daily contact. On average the contact frequency at the time of the second interview was twice as less as the contact frequency during the first interview. Hence, one can say that the level of friendship erosion was notable. The extent of friendship dissolution was somewhat less extreme. Around nine percent of the respondents did not report any contact at the time of the second interview. So, friendship erosion was a better measure to investigate friendships than friendship dissolution.

Now, the results of each of the components will be discussed, beginning with the friendship rewards. Higher levels of friendship rewards were expected to lower the chance of dissolution and lead to less friendship erosion. Friendship rewards were measured with the exchange of instrumental and emotional support. The intensity of emotional support exchange was negatively related to friendship erosion and dissolution. The balance of giving and receiving emotional support did not affect erosion levels and the chance of ending a friendship, indicating that both giving and receiving emotional support were experienced as satisfying. The influence of the instrumental support exchange was some what more complex. Higher instrumental support intensity was associated with higher levels of

erosion. The imbalance of giving and receiving instrumental support had a positive effect on the chance of ending the friendship. This means that needier relationships erode more and the actual imbalance may cause the friendship to end. Looking back at the hypotheses on friendships rewards, this means that hypothesis 1a was supported for the exchange of instrumental support and rejected for the exchange of emotional support whereas hypothesis 1b was supported for emotional and rejected for instrumental support. The exception of intensity of instrumental support on erosion is probably due to the fact that in friendships with a high instrumental support intensity mostly one person is needier than the other. Friendship rewards were also approximated by the degree of similarity in age, gender, education, cohabitation situation, and child situation between the two friends. The assumption was that more similar friendships yield the highest rewards. Homophily in age and gender affected friendship erosion and dissolution in the expected way. On the contrary homophily in education, cohabitation situation, and child situation did not affect erosion and dissolution. Hypothesis 1c found mixed support, five out of the possible twelve results were as expected.

The second component of the comprehensive view was costs. Higher levels of friendship costs were associated with higher levels of erosion and a bigger chance of ending the friendship. Friendship costs were approximated with changes in a person's time budget. Changes to a broader time budget were supposed to lead to less erosion and friendship dissolution whereas changes towards a tighter time budget were supposed to lead to more erosion and friendship dissolution. Changes in time budget were approximated with life course transitions. Life course transitions towards a tighter time budget reasonably followed the hypothesis. The transition towards cohabitation and the transition to employment both caused higher level of erosion and increased the chance of ending the friendship. The transition to parenthood on the other hand did not affect the level of erosion nor did it influence the change of ending a friendship. Hypothesis 2b was thus supported for two of the three indicators. The transitions towards a broader time budget, however did not lead to lower levels of erosion and also did not lower the change of friendship termination, hypothesis 2c was rejected. The transition to single living did significantly affect friendship dissolution, but opposite to what was expected, it increased the chance of ending the friendship. This may be explained by possible conflicting loyalties between anchor, friend, and partner. We will come back to that when the interactions of several transitions with age are discussed. Moving, and especially moving when the initial distance was small had a positive effect on friendship erosion and dissolution confirming hypothesis 2d. The general costs hypothesis was supported by two of the possible six results.

The mediating effect of age on the relation between life course transitions and friendship erosion and dissolution was investigated to further explore the life course transition effects. These results nuanced earlier outcomes. Assuming that most friends are made early in life and that in older friendships more has been invested, the effects of the transitions to a tighter time budget in general seemed to be mediated by investments; the transitions to cohabitation and to employment had a smaller (less positive) effect when people are older. The transition to parenthood was the exception. In

general, the transitions to a broader time budget were not mediated by age. Only the effect of the transition to single living was mediated by age, at young ages breaking up caused less erosion than remain single living, whereas becoming single living between mid thirty and mid sixty caused more erosion and dissolution than remain single living. This may be explain by the fact that in cohabiting relationship after a while the partner also invests in the friendships of the partner and therefore breaking up leads to conflicting loyalties among this triad. This means that the concept of investments can play a role in the transition to single living too, but the investment is not made by the anchor but by the partner. Hence, one can cautiously say that investments mediated the effects of several life course transitions. Coming back to the central cost hypothesis, it is clear that it only holds for transitions to a tighter time budget and it predominantly holds for early stages of a friendship. Furthermore, the transitions to a broader time budget did not follow the central cost hypothesis. This may be because the effect of having more time was balanced out by conflicting loyalties, and loss of social contacts causing people to be less socially embedded.

Sequentially, the friendship alternatives are discussed. The basic hypothesis was that higher numbers of alternatives were associated with higher levels of friendship erosion and a smaller chance of friendship dissolution. Only the number of siblings positively affected friendship erosion, which supported the idea that siblings can act as an alternative to the friendship. However, the number of siblings did not affect the chance of ending the friendship, hence hypothesis 3b was only partially supported. The number of other friends had a negative effect on friendship erosion and more socially active people had a smaller chance of ending the friendship. This suggested that having a bigger social network was more an advantage for friendships than a disadvantage. Hypotheses 3a and 3c and 3d were rejected. As discussed in the section on friendship costs the transition to cohabitation had a positive influence on erosion and dissolution. This finding can also can be interpreted in terms of alternatives. The partner can act as an alternative to a friendship and that is why levels of erosion and dissolution were higher. This finding, supported the alternatives hypothesis. In all, the basis hypothesis on friendships alternatives was partially supported, a partner and siblings can act as an alternative, whereas people with more other friends and who were more socially active did not endure more erosion and dissolution. A possible explanation for the unexpected findings of the number of other friends is that people who have more close friends are more sociable and therefore are better at maintaining friendships than people who have only one close friend.

The last component was the friendship investments. The basic hypothesis was that higher levels of investments are negatively related to friendship erosion and dissolution. Friendship investments were approximated by the mean age of the friends, assuming that friendships are made early in life and that in old friendships more has been invested. As expected, older people's friendships were less susceptible to erosion and dissolution. This supported hypothesis 4a. Friendship investments were also approximated with the type of friendship. Family and partner friends were the types of friendships that were the most stable in terms of contact frequency. Also school friends were less

susceptible to erosion than the reference category. Analysing dissolution revealed that only school friendships had a significantly smaller chance of being ended. Investigating the interaction of age with the type of friends on erosion showed that school friends at first experienced more erosion than the reference group but after they survived the initial phase, showed lower levels of erosion than the reference category. Indicating, that if school friendships last longer they become more stable probably due to higher investments over time. At older ages the levels of erosion were bigger again may be due to a decrease in mobility. This may also explain why school friendships had an increasing change of ending with age compared to the reference category. Overall the basis hypothesis on friendship investments largely was supported, six out of the possible ten results were as expected. Furthermore, the interactions of several life course transitions with age, supported this conclusion even more.

5.2 Limitations

The explanatory power of the suggested models was very limited. The tables on friendship erosion and dissolution showed that the explained variance was less then ten percent in each model. This lack of predictive power relates to one of the study's short comings. Namely, one of the difficult points of this study is the construct validity of each of the components. In other words, to what extent does the selected interpretation of the components actually approximate the theoretical components? To what extent does exchange of support cover the concept of friendship rewards? Although, undoubtedly support is one of friendship's reward there are of course others, such as trust and a sense of belonging. The same goes for the friendship costs, time is one of the resource needed to maintain a friendship, but money and more generally effort are also friendship costs. The issue of construct validity is a smaller problem with the number of alternatives. Other friends, brothers, and sisters are a pretty good objective measure of the possible alternatives for the friendship. However, not only the quantity of the alternatives is important, the theory also explicitly speaks of the quality of the alternatives. The quality of alternatives is not taken into the measure of the friendship alternatives in this study. Furthermore, does the type of friendship really measure the concept of friendship investments? Assumptions had to be made to allow this. Overall, one can say that the chosen proxies only to certain extent cover the theoretical concepts and that may also explain why the predictive power of the model is limited.

Another limitation may be the discriminant validity. Discriminant validity means; to what extent do the proxies only cover the concept they are supposed to cover. Especially, with the life course transitions this may be a problem. Making a transition not only affect a person's time budget but it also places a person in an other social environment, which offers that person other alternatives, and it may also cause people to prioritise other friendship rewards. Hence, making life course transitions should not be considered to cover friendship costs alone but it may also reflect changes in friendship rewards and alternatives. For example, the transition to cohabitation can be a proxy for friendship costs but it also can be a proxy for friendship alternatives.

A friendship is dyadic relationship and therefore not only can the friends affect the friendship individually also dyadic characteristics can play a role in maintaining friendships. The baseline models clearly show this. This study chose, because of limitations in the data, to investigate the friendship erosion and dissolution mainly from an anchor perspective. Although that the control variables cover some dyadic characteristics at the first wave, the investigation of the friendship rewards, costs, alternatives and investments, are mainly measured and approach from the anchor respondent only . This means that the friend's view on the support exchange is left out of this study. Also the investments made by the friend are not known. More importantly, it is unknown whether the respondent makes any of the life course transitions and what the friend's number of alternatives are. This lack of information of the friend is only problematic if the friend's characteristics interact or correlate with those of the respondent. For example, when the anchor makes the transition to cohabitation it is known that the erosion and chance of ending the friendship is higher than when this person remains single living, if the friend also makes the transition, the effect of the transition to cohabitation by the anchor may be overestimated (assuming that only a costs argument plays a role). It is even more problematic when the situation of the respondent and friends interact, for example when a friendship experiences less erosion and has a smaller chance of ending if both anchor and friend make the transition to cohabitation than when only one of them makes the transition. In other words, investigating friendship erosion and dissolution from an anchor perspective does not allow to investigate whether there is a difference in converging and diverging friendships. The effect of the transition to cohabitation can then be underestimated due to the homophily principle.

5.3 Relation to earlier literature

When one compares this study to related studies in the field of friendship dissolution some finding are new, some are in line with other studies, and some are different. Some new findings are the effect of the number of siblings, and the effect of becoming employed. Furthermore, the support found, on the conflicting loyalties argument, is to my knowledge not found in earlier studies specific on friendship dissolution.

Other results are in line with other studies, the effect of the transition to cohabitation is in line with results found by Kalmijn (2003). The positive effect of the distance on friendship dissolution is similar to the results of Klein Ikkink and van Tilburg (1999) and Martin and Yeung (2006). Also the effects of the intensity of emotional support and the degree of imbalance of instrumental support are comparable to the results of Klein Ikkink and van Tilburg (1999), and Oswald and Clark's results (2003) results on supportiveness. In addition, the effect of age, as a proxy for friendship length, is similar to the effect of friendship length found by Owens (2003). Finally the effect of similarity is in line with several other studies (e.g. Zeggelink, 1995; Owens, 2003)

In comparison to related studies the effect of alternatives differs in this study. The concept of alternatives is one of the few concepts which finds multiple support in the literature (Rusbult, 1980b; Branje et al., 2007; Owens, 2003). Having more alternatives and having good quality alternatives is in other studies proven to increase the change of friendship dissolution. Why this is not the case in study remains unclear. Maybe the answer lies in the way the concept of alternatives is measured in these studies. Namely, the subjective feeling of have good alternatives is used instead of the actual objective number of alternatives. It may be that a selection effect plays a role, people who have the feeling that they have good alternatives at their disposal are also the people that are looking for other friends.

Overall, it can be said that this study offers some new findings and confirms several earlier findings, and with that contribute to the strengthening of the theoretical base. Hence, this study's scientific relevance is not only the contribution to a more comprehensive view on friendship erosion and dissolution but also the confirmation of earlier findings on friendship dissolution but with more general data. Furthermore, this study is of value because it is one of the few studies, which actually measures the behaviour act of friendship dissolution and erosion and uses large scale longitudinal data.

5.4 Further research

A first suggestion for further research is to include more proxies for the four theoretical concepts; especially for the concept of investments better proxies are needed. One can for example use the length of the friendship and the age at with the friendship is formed. Also common experiences, such as being at each other wedding or graduating together, can be used to approximate the concept of investments. More generally it may be useful to include both indirect and direct measures in a following survey, in order to investigate to what extent the proxies measure the concepts they suppose to measure. This also allows for better testing of the theory in general. It is recommended to use the Rusbult items as the direct measure, since her measures are already used and proven useful in several studies (Branje et al., 2007; Le and Agnew, 2003; Oswald and Clark, 2003; Rusbult, 1980a; 1980b; 1983; Rusbult et al., 1998).

As already mentioned this study has taken a broad approach and therefore was unable to go into some of the interesting findings in detail. Especially the findings of several life course transitions left room for further research. For example the cohabitation transitions can be investigated further from a costs perspective. The cohabitation transitions can for example be specified into start dating, start living together, and getting married. In addition, one can investigate if it matters whether it is the first time that one starts a cohabiting relation or not. Moreover, the exact time of the transition to cohabitation between the two waves can also be investigated. The transition to single living also gives leads for further research, one can for example specify between voluntary break up (divorce) and involuntary break up (widowing). But also the results of the support exchange, alternatives, and investment can be the main subject for further research. To make it even more elaborate, each of the

suggestions for further research can be broken down by friendship characteristics such as, type of friendship, and gender composition. As one can see this study opens up a lot of new subjects for further research. One finding in particular that is interesting for further research is the role of conflicting loyalties in the transition to single living. To investigate this, one should gather information on the relationship of the anchor and friend and also on the relationship of the respondent's partner and the respondent's friend.

Methodologically also some improvements can be made. First of all it is recommended to gather more longitudinal data on the friend. This study was only able to control for a small number of the friend's characteristics in wave one. Including longitudinal data on the friend, allows for a more dyadic approach and with that test whether converging or diverging friendships experience different levels of erosion and dissolution. It would even be more interesting to gather information on multiple close friends. It would then be possible to investigate the effects of network characteristics with a longitudinal multilevel analysis. Ultimately, it would be possible to broaden the theoretical scope to a network level.

5.5 General conclusion

Now an answer to the central research question will be formulated. The central research question in this study was:

> *To what extent can friendship dissolution and friendship erosion be examined from a perspective on marital dissolution?*

Let me start by saying that this study has an explorative character and that its strength is its broad approach. In addition, this study shows that implementing a general perspective is a complex and challenging task, which cannot be accomplished by this study alone. Having said that, approaching friendships in terms of rewards, costs, alternatives and investments is useful to determine risk factors of friendship erosion and dissolution. The analysis of friendship rewards and investment generally follow the expectation derived for the theoretical perspective. The analyses of friendship costs and alternatives showed mixed results. The predictive power was limited, which may be due to the fact that friendship rewards, costs, alternatives, and investment are not (and never can be) fully approximated with the proposed proxies. The perspective is more a heuristic device to derive hypotheses on risk factors of erosion and dissolution. In that sense, this study has proven that the perspectives on marital dissolution provide a good starting point and theoretical framework to investigate friendship erosion and dissolution.

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Appendix A Questionnaire items

A.1 Instrumental support given

In the last three months, did you give help to ***{friend}*** with housework, such as preparing meals, cleaning, fetching groceries, doing the laundry?

1 none
2 once or twice
3 several times

In the last three months, did you give help to ***{friend}*** with practical matters such as chores in and around the house, lending things, transportation, moving things?

1 none
2 once or twice
3 several times

Have you donated ***{friend}*** valuable objects or a substantial amount of money in the past 12 months? Please include any monthly transfers

1 yes
2 no

A.2 Emotional support given

Have you shown an interest in the personal life of ***{friend}*** in the last 3 months?

1 none
2 once or twice
3 several times

Did you give council or good advice to ***{friend}*** in the last 3 months?

1 none
2 once or twice
3 several times

Were you present at the most recent birthday of ***{friend}***?

1 yes
2 no

A.3 Instrumental support received

In the last three months, did you receive help from ***{friend}*** with housework, such as preparing meals, cleaning, fetching groceries, doing the laundry?

1 none
2 once or twice
3 several times

In the last three months, did you receive help from ***{friend}*** with practical matters such as chores in and around the house, lending things, transportation, moving things?

1 none
2 once or twice
3 several times

In the last 12 months , did you receive valuable objects or a substantial amount of money from ***{friend}***? Please include any monthly transfers.

1 yes
2 no

A.4 Emotional support received items

Has ***{friend}*** shown an interest in your personal life in the last 3 months?

1 none
2 once or twice
3 several times

Did you get counsel or good advice from ***{friend}*** in the last 3 months?

1 none
2 once or twice
3 several times

Was {friend} present at your most recent birthday?

1 yes
2 no

A.5 Social activity

Are you a member of any of the following clubs or voluntary associations?

Sports association

1 no

2 yes

Trade union, employers' organization or professional association

1 no

2 yes

An association with a societal objective

1 no

2 yes

Political party

1 no

2 yes

Religious or church association

1 no

2 yes

A choir, drama association or music society

1 no

2 yes

A hobby or leisure-time association, youth association

1 no

2 yes

Did you participate in any of the following activities in your free time in the past **12 months?** If so, about how often?

Participate in school association, parent-teacher association or other activity for school

1 not at all

2 1-2 times

3 3-11 times

4 12 times or more

Provide unpaid help to sick or handicapped acquaintances or neighbours (not family)

1 not at all

2 1-2 times

3 3-11 times

4 12 times or more

Volunteer work for association, church or other organization (not for school)

1 not at all

2 1-2 times

3 3-11 times

4 12 times or more

Visit neighbours, have neighbours visit you

1 not at all

2 1-2 times

3 3-11 times

4 12 times or more

Appendix B1 Full models friendship rewards

Table B1.1 Unstandardised regression coefficients and standard errors of the full OLS regression model of friendship erosion on friendship rewards

	Model 1 **B (OLS)** (s.e)	Model 2 **B (OLS)** (s.e)	Model 3 **B (OLS)** (s.e)	Model 4 **B (OLS)** (s.e)	Model 5 **B (OLS)** (s.e)
Constant	1,100***	1,138***	1,039***	1,063***	1,050***
	(0,069)	(0,085)	(0,072)	(0,101)	(0,116)
Support Exchange					
Intensity instrumental support		0,758***			0,659***
		(0,119)			(0,136)
Intensity emotional support		-0,216**			-0,169*
		(0,082)			(0,085)
Instrumental support balance			0,382***		0,081
			(0,102)		(0,119)
Emotional support balance			0,062		0,034
			(0,094)		(0,096)
Homophily					
Absolute age difference				0,019***	0,018***
				(0,003)	(0,003)
Both male				-0,104*	-0,106*
				(0,053)	(0,053)
Both female				-0,133**	-0,101*
				(0,052)	(0,052)
Absolute educational difference				-0,007	-0,009
				(0,013)	(0,013)
Cohabiting homophily				-0,085*	-0,069
				(0,045)	(0,045)
Children homophily				0,065	0,065
				(0,047)	(0,047)
Dyadic controls					
Mean age	-0,025***	-0,023***	-0,024***	-0,027***	-0,025***
	(0,001)	(0,001)	(0,001)	(0,001)	(0,001)
Mean age^2 (x 1000)	0,264**	0,254**	0,267**	0,345***	0,328***
	(0,088)	(0,087)	(0,088)	(0,089)	(0,089)
Mean educational level	-0,043***	-0,041***	-0,042***	-0,041***	-0,039***
	(0,011)	(0,011)	(0,011)	(0,011)	(0,011)
Household income T1	-0,005***	-0,005***	-0,005***	-0,004***	-0,004**
	(0,001)	(0,001)	(0,001)	(0,001)	(0,001)
Distance T1	-0,046***	-0,039***	-0,043***	-0,041***	-0,034***
	(0,008)	(0,008)	(0,008)	(0,008)	(0,008)
N	5248	5248	5248	5248	5248
R^2	0,066	0,073	0,069	0,074	0,080

*p<0,05 **p<0,01 ***p<0,001 (one tailed)

Table B1.2 Unstandardised regression coefficients and standard errors of the full logistic regression model of friendship erosion on friendship rewards

	Model 1 **B (logit)** (s.e)	Model 2 **B (logit)** (s.e)	Model 3 **B (logit)** (s.e)	Model 4 **B (logit)** (s.e)	Model 5 **B (logit)** (s.e)
Constant	-1,489***	-0,837***	-1,633***	-1,586***	-1,006***
	(0,175)	(0,208)	(0,185)	(0,260)	(0,293)
Support Exchange					
Intensity instrumental support		0,178			-0,173
		(0,305)			(0,372)
Intensity emotional support		-1,130***			-1,219***
		(0,207)			(0,217)
Instrumental support balance			0,366		0,706*
			(0,251)		(0,305)
Emotional support balance			0,473*		0,220
			(0,238)		(0,242)
Homophily					
Absolute age difference				0,027***	0,023***
				(0,008)	(0,008)
Both male				-0,381**	-0,380**
				(0,138)	(0,139)
Both female				-0,067	0,036
				(0,127)	(0,129)
Absolute educational difference				0,008	0,008
				(0,034)	(0,034)
Cohabiting homophily				-0,074	-0,063
				(0,113)	(0,114)
Children homophily				0,020	0,031
				(0,123)	(0,123)
Dyadic controls					
Mean age	-0,027***	-0,032***	-0,027***	-0,031***	-0,035***
	(0,004)	(0,004)	(0,004)	(0,004)	(0,004)
Mean age^2 (x 1000)	-0,510*	-0,428*	-0,503*	-0,339	-0,278
	(0,246)	(0,247)	(0,246)	(0,252)	(0,253)
Mean educational level	-0,113***	-0,101***	-0,111***	-0,105***	-0,087***
	(0,028)	(0,028)	(0,028)	(0,028)	(0,028)
Household income T1	-0,016***	-0,016***	-0,016***	-0,015***	-0,015***
	(0,003)	(0,004)	(0,003)	(0,003)	(0,004)
Distance T1	0,142***	0,126***	0,145***	0,149***	0,134***
	(0,023)	(0,023)	(0,023)	(0,024)	(0,024)
N	5248	5248	5248	5248	5248
Nagelkerke R^2	3015,637	2985,387	3009,544	2989,725	2951,295
-2 log likelihood	0,056	0,069	0,059	0,067	0,083

*p<0,05 **p<0,01 ***p<0,001 (one tailed)

Appendix B2 Full models friendship costs

Table B2.1 Unstandardised regression coefficients and standard errors of the full OLS regression model of friendship erosion on friendship costs

	Model 1 **B (OLS)** (s.e)	Model 2 **B (OLS)** (s.e)	Model 3 **B (OLS)** (s.e)	Model 4 **B (OLS)** (s.e)	Model 5 **B (OLS)** (s.e)	Model 6 **B (OLS)** (s.e)	Model 7 **B (OLS)** (s.e)
Constant	1,062***	1,283***	1,109***	1,039***	0,988***	0,941***	1,053***
	(0,071)	(0,080)	(0,077)	(0,078)	(0,071)	(0,071)	(0,089)
Transition to cohabiting		0,321***					0,258**
		(0,087)					(0,087)
Transition to single living		-0,304**					-0,384***
		(0,113)					(0,113)
Continuous cohabiting		-0,331***					-0,313***
		(0,052)					(0,056)
Parenthood			-0,199**				-0,121
			(0,084)				(0,085)
Empty nest			0,059				0,083
			(0,074)				(0,074)
Continuous children at home			-0,128**				0,037
			(0,049)				(0,052)
Transition to employment				0,276**			0,316***
				(0,104)			(0,093)
Transition to unemployment				0,109			0,107
				(0,088)			(0,079)
Continuous employed				-0,027			0,064
				(0,060)			(0,060)
Moved					0,354***	0,543***	0,523***
					(0,044)	(0,048)	(0,049)
Moved X distance T1						-0,152***	-0,147***
						(0,017)	(0,017)
Dyadic controls							
Mean age	-0,025***	-0,020***	-0,026***	-0,025***	-0,020***	-0,021***	-0,018***
	(0,001)	(0,001)	(0,001)	(0,002)	(0,001)	(0,001)	(0,002)
Mean age^2 (x 1000)	0,267**	0,056	0,207*	0,254**	0,141	0,149*	-0,010
	(0,088)	(0,090)	(0,097)	(0,090)	(0,089)	(0,088)	(0,099)
Both male	0,023	0,024	0,022	0,031	0,026	0,023	0,042
	(0,043)	(0,043)	(0,043)	(0,044)	(0,043)	(0,043)	(0,043)
Mixed gender	0,164***	0,145**	0,160***	0,165***	0,161***	0,154***	0,146**
	(0,051)	(0,051)	(0,051)	(0,051)	(0,051)	(0,051)	(0,051)
Mean educational level	-0,044***	-0,049***	-0,043***	-0,043***	-0,046***	-0,044***	-0,045***
	(0,011)	(0,011)	(0,011)	(0,011)	(0,011)	(0,011)	(0,011)
Household income T1	-0,005***	-0,002	-0,004***	-0,004***	-0,005***	-0,005***	-0,001
	(0,001)	(0,001)	(0,001)	(0,001)	(0,001)	(0,001)	(0,001)
Distance T1	-0,046***	-0,047***	-0,047***	-0,046***	-0,050***	-0,006	-0,008
	(0,008)	(0,008)	(0,008)	(0,008)	(0,008)	(0,009)	(0,009)
N	5248	5248	5248	5248	5248	5248	5248
R^2	0,068	0,081	0,070	0,070	0,079	0,093	0,106

*p<0,05 **p<0,01 ***p<0,001 (one tailed)

Table B2.2 Unstandardised regression coefficients and standard errors of the full logistic regression model of friendship erosion on friendship costs

	Model 1 **B (logit)** (s.e)	Model 2 **B (logit)** (s.e)	Model 3 **B (logit)** (s.e)	Model 4 **B (logit)** (s.e)	Model 5 **B (logit)** (s.e)	Model 6 **B (logit)** (s.e)	Model 7 **B (logit)** (s.e)
Constant	-1,434***	-1,153***	-1,397***	-1,472***	-1,532***	-1,674***	-1,634***
	(0,182)	(0,201)	(0,204)	(0,198)	(0,184)	(0,190)	(0,237)
Transition to cohabiting		0,347*					0,278*
		(0,174)					(0,177)
Transition to single living		0,234					0,039
		(0,252)					(0,263)
Continuous cohabiting		-0,475***					-0,438**
		(0,129)					(0,146)
Parenthood			-0,327				-0,201
			(0,220)				(0,229)
Empty nest			0,325*				0,290
			(0,172)				(0,180)
Continuous children at home			-0,264*				0,015***
			(0,130)				(0,147)
Transition to employment				0,348			0,459**
				(0,220)			(0,195)
Transition to unemployment				0,252			0,308
				(0,215)			(0,197)
Continuous employed				-0,092			0,135
				(0,152)			(0,153)
Moved					0,422***	0,755***	0,722***
					(0,109)	(0,131)	(0,133)
Moved X distance T1						-0,204***	-0,200***
						(0,045)	(0,046)
Dyadic controls							
Mean age	-0,028***	-0,022***	-0,030***	-0,028***	-0,022***	-0,023***	-0,020***
	(0,004)	(0,004)	(0,004)	(0,004)	(0,004)	(0,004)	(0,005)
Mean age^2 (x 1000)	-0,510*	-0,826***	-0,624*	-0,555*	-0,659**	-0,659**	-0,894**
	(0,246)	(0,255)	(0,279)	(0,253)	(0,250)	(0,250)	(0,285)
Both male	-0,313**	-0,317**	-0,303**	-0,296**	-0,307**	-0,316**	-0,282**
	(0,116)	(0,116)	(0,117)	(0,117)	(0,116)	(0,116)	(0,118)
Mixed gender	0,128	0,105	0,125	0,131	0,129	0,122	0,118
	(0,125)	(0,126)	(0,126)	(0,125)	(0,125)	(0,125)	(0,127)
Mean educational level	-0,111***	-0,118***	-0,107***	-0,106***	-0,114***	-0,115***	-0,111***
	(0,028)	(0,028)	(0,028)	(0,028)	(0,028)	(0,028)	(0,029)
Household income T1	-0,016***	-0,011**	-0,014***	-0,014***	-0,016***	-0,016***	-0,009**
	(0,003)	(0,004)	(0,004)	(0,004)	(0,003)	(0,003)	(0,004)
Distance T1	0,142***	0,140***	0,138***	0,142***	0,137***	0,230***	0,228***
	(0,023)	(0,023)	(0,023)	(0,023)	(0,023)	(0,033)	(0,033)
N	5248	5248	5248	5248	5248	5248	5248
Nagelkerke R^2	0,061	0,074	0,067	0,064	0,067	0,076	0,090
-2 log likelihood	3003,396	2973,480	2990,255	2996,234	2988,494	2968,368	2932,035

*p<0,05 **p<0,01 ***p<0,001 (one tailed)

Table B2.3 Unstandardised regression coefficients and standard errors of the OLS regression model of friendship erosion on the interaction of age with friendship costs

	B (OLS) (s.e)		**B (OLS)** (s.e)		**B (OLS)** (s.e)
Constant	1,216***	Constant	1,078***	Constant	1,074***
	(0,088)		(0,078)		(0,080)
Transition to cohabiting	0,112	Parenthood	-0,036	Transition to employment	0,271*
	(0,151)		(0,166)		(0,143)
Transition to single living	0,042	Empty nest	0,180*	Transition to unemployment	0,079
	(0,152)		(0,092)		(0,123)
Continuous cohabiting	-0,258***	Continuous children at	-0,064	Continuous employed	-0,135*
	(0,070)		(0,058)		(0,070)
Transition to cohabiting	0,015	Parenthood	0,029**	Transition to employment	-0,019*
X mean age	(0,010)	X mean age	(0,011)	X mean age	(0,009)
Transition to single living	0,030***	Empty nest	0,001	Transition to unemployment	-0,010
X mean age	(0,009)	X mean age	(0,008)	X mean age	(0,007)
Continuous cohabiting	0,011***	Continuous children at	0,014***	Continuous employed	-0,004***
X mean age	(0,003)	X mean age	(0,004)	X mean age	(0,004)
Transition to cohabiting	1,080*	Parenthood	0,719	Transition to employment	-0,190
X mean age^2 (x1000)	(0,473)	X mean age^2 (x1000)	(0,713)	X mean age^2 (x1000)	(0,491)
Transition to single living	-1,816***	Empty nest	-1,167*	Transition to unemployment	0,333
X mean age^2 (x1000)	(0,522)	X mean age^2 (x1000)	(0,589)	X mean age^2 (x1000)	(0,408)
Continuous cohabiting	-0,354*	Continuous children at	-0,267*	Continuous employed	0,909***
X mean age^2 (x1000)	(0,191)	X mean age^2 (x1000)	(0,350)	X mean age^2 (x1000)	(0,239)
Dyadic controls					
Mean age	-0,026***	Mean age	-0,028***	Mean age	-0,017***
	(0,002)		(0,002)		(0,003)
Mean age^2 (x 1000)	0,181	Mean age^2 (x 1000)	0,299**	Mean age^2 (x 1000)	-0,159
	(0,142)		(0,103)		(0,156)
Both male	0,004	Both male	0,009	Both male	0,039
	(0,043)		(0,044)		(0,044)
Mixed gender	0,133**	Mixed gender	0,149**	Mixed gender	0,170***
	(0,051)		(0,052)		(0,051)
Mean educational level	-0,044***	Mean educational level	-0,041***	Mean educational level	-0,042***
	(0,011)		(0,011)		(0,011)
Household income T1	-0,002	Household income T1	-0,004***	Household income T1	-0,004**
	(0,001)		(0,001)		(0,001)
Distance T1	-0,047***	Distance T1	-0,048***	Distance T1	-0,046***
	(0,008)		(0,008)		(0,008)
N	5248		5248		5248
R^2	0,086		0,072		0,072

*p<0,05 **p<0,01 ***p<0,001 (one tailed)

Table B2.4 Unstandardised regression coefficients and standard errors of the logistic regression model of friendship dissolution on the interaction of age with friendship costs

	B (logit) (s.e)		**B (logit)** (s.e)		**B (logit)** (s.e)
Constant	-1,130***	Constant	-1,389***	Constant	-1,452***
	(0,217)		(0,206)		-0,009
Transition to cohabiting	0,496*	Parenthood	0,121	Transition to employment	0,213
	(0,297)		(0,424)		(0,342)
Transition to single living	0,685*	Empty nest	0,398*	Transition to unemployment	0,358
	(0,330)		(0,214)		(0,304)
Continuous cohabiting	-0,544***	Continuous children at	-0,443**	Continuous employed	-0,170
	(0,171)		(0,163)		(0,183)
Transition to cohabiting	0,022	Parenthood	0,028	Transition to employment	-0,081*
X mean age	(0,018)	X mean age	(0,026)	X mean age	(0,043)
Transition to single living	-0,008	Empty nest	-0,016	Transition to unemployment	-0,038*
X mean age	(0,029)	X mean age	(0,018)	X mean age	(0,019)
Continuous cohabiting	-0,008	Continuous children at	-0,008	Continuous employed	-0,021*
X mean age	(0,008)	X mean age	(0,013)	X mean age	(0,013)
Transition to cohabiting	0,601	Parenthood	-0,444	Transition to employment	-1,886
X mean age^2 (x1000)	(0,923)	X mean age^2 (x1000)	(1,833)	X mean age^2 (x1000)	(1,819)
Transition to single living	-4,282*	Empty nest	-1,145	Transition to unemployment	-0,260
X mean age^2 (x1000)	(2,233)	X mean age^2 (x1000)	(1,541)	X mean age^2 (x1000)	(1,198)
Continuous cohabiting	0,417	Continuous children at	1,601*	Continuous employed	0,809
X mean age^2 (x1000)	(0,551)	X mean age^2 (x1000)	(0,936)	X mean age^2 (x1000)	(0,696)
Dyadic controls					
Mean age	-0,020***	Mean age	-0,028***	Mean age	-0,009
	(0,006)		(0,004)		(0,009)
Mean age^2 (x 1000)	-0,798*	Mean age^2 (x 1000)	-0,681*	Mean age^2 (x 1000)	-1,227**
	(0,366)		(0,297)		(0,479)
Both male	-0,311**	Both male	-0,283**	Both male	-0,278**
	(0,117)		(0,118)		(0,117)
Mixed gender	0,105	Mixed gender	0,137	Mixed gender	0,146
	(0,126)		(0,126)		(0,126)
Mean educational level	-0,121***	Mean educational level	-0,105***	Mean educational level	-0,108***
	(0,028)		(0,028)		(0,028)
Household income T1	-0,011**	Household income T1	-0,014***	Household income T1	-0,014***
	(0,004)		(0,004)		(0,004)
Distance T1	0,139***	Distance T1	0,137***	Distance T1	0,143***
	(0,024)		(0,024)		(0,023)
N	5248		5248		5248
R^2	0,077		0,070		0,069
-2 log likelihood	2963,981		2982,793		2985,908

*p<0,05 **p<0,01 ***p<0,001 (one tailed)

Appendix B3 Full models friendship alternatives

Table B3.1 Unstandardised regression coefficients and standard errors of the full OLS regression model of friendship erosion on friendship alternatives

	Model 1 **B (OLS)** (s.e)	Model 2 **B (OLS)** (s.e)	Model 3 **B (OLS)** (s.e)	Model 4 **B (OLS)** (s.e)	Model 5 **B (OLS)** (s.e)
Constant	1,062*** (0,071)	1,111*** (0,076)	0,996*** (0,081)	1,081*** (0,075)	1,060*** (0,089)
Primary friendship alternatives					
Number of other close friend		-0,025* (0,014)			-0,023† (0,014)
Number of siblings			0,019* (0,011)		0,019† (0,011)
Secondary friendship alternatives					
Social activities				-0,095 (0,127)	-0,090 (0,127)
Dyadic controls					
Mean age	-0,025*** (0,001)	-0,025*** (0,001)	-0,025*** (0,001)	-0,025*** (0,001)	-0,025*** (0,001)
Mean age^2 (x 1000)	0,267** (0,088)	0,270** (0,088)	0,290*** (0,089)	0,264** (0,088)	0,288** (0,089)
Both male	0,023 (0,043)	0,021 (0,043)	0,022 (0,043)	0,023 (0,043)	0,020 (0,043)
Mixed gender	0,164*** (0,051)	0,168*** (0,051)	0,165*** (0,051)	0,163*** (0,051)	0,168*** (0,051)
Mean educational level	-0,044*** (0,011)	-0,041*** (0,011)	-0,042*** (0,011)	-0,042*** (0,011)	-0,038*** (0,011)
Household income T1	-0,005*** (0,001)	-0,005*** (0,001)	-0,005*** (0,001)	-0,005*** (0,001)	-0,005*** (0,001)
Distance T1	-0,046*** (0,008)	-0,046*** (0,008)	-0,046*** (0,008)	-0,046*** (0,008)	-0,046*** (0,008)
N	5248	5248	5248	5248	5248
R^2	0,068	0,068	0,068	0,068	0,068

*p<0,05 **p<0,01 ***p<0,001 (one tailed)

Table B3.2 Unstandardised regression coefficients and standard errors of the full logistic regression model of friendship erosion on friendship alternatives

	Model 1 **B (logit)** (s.e)	Model 2 **B (logit)** (s.e)	Model 3 **B (logit)** (s.e)	Model 4 **B (logit)** (s.e)	Model 5 **B (logit)** (s.e)
Constant	-1,434***	-1,427***	-1,543***	-1,189***	-1,325***
	(0,182)	(0,195)	(0,212)	(0,192)	(0,231)
Primary friendship alternatives					
Number of other close friend		-0,003			0,008
		(0,037)			(0,037)
Number of siblings			0,031		0,035
			(0,030)		(0,030)
Secondary friendship alternatives					
Social activities				-1,329***	-1,344***
				(0,347)	(0,347)
Dyadic controls					
Mean age	-0,028***	-0,028***	-0,028***	-0,025***	-0,026***
	(0,004)	(0,004)	(0,004)	(0,004)	(0,004)
Mean age^2 (x 1000)	-0,510*	-0,509*	-0,480*	-0,525*	-0,493*
	(0,246)	(0,246)	(0,248)	(0,245)	(0,247)
Both male	-0,313**	-0,313**	-0,313**	-0,316**	-0,314**
	(0,116)	(0,116)	(0,116)	(0,116)	(0,116)
Mixed gender	0,128	0,129	0,131	0,116	0,118
	(0,125)	(0,125)	(0,125)	(0,125)	(0,126)
Mean educational level	-0,111***	-0,110***	-0,108***	-0,090***	-0,087***
	(0,028)	(0,028)	(0,028)	(0,028)	(0,029)
Household income T1	-0,016***	-0,016***	-0,016***	-0,016***	-0,016***
	(0,003)	(0,003)	(0,003)	(0,003)	(0,003)
Distance T1	0,142***	0,142***	0,142***	0,136***	0,136***
	(0,023)	(0,023)	(0,023)	(0,023)	(0,023)
N	5248	5248	5248	5248	5248
R^2	0,061	0,061	0,062	0,068	0,068
-2 log likelihood	3003,396	3003,388	3002,338	2988,214	2986,864

*p<0,05 **p<0,01 ***p<0,001 (one tailed)

Appendix B4 Full models friendship investments

Table B4.1 Unstandardised regression coefficients and standard errors of the full OLS regression model of friendship erosion on friendship investments

	Model 1 **B (OLS)** (s.e)	Model 2 **B (OLS)** (s.e)	Model 3 **B (OLS)** (s.e)	Model 4 **B (OLS)** (s.e)	Model 5 **B (OLS)** (s.e)
Constant	0,995***	1,062***	1,019***	1,108***	1,117***
	(0,066)	(0,071)	(0,067)	(0,072)	(0,072)
Mean age		-0,025***		-0,026***	-0,024***
		(0,001)		(0,001)	(0,002)
Mean age^2 (x 1000)		0,267**		0,302***	0,090
		(0,088)		(0,088)	(0,113)
School friend			0,066	-0,176***	-0,411***
			(0,053)	(0,054)	(0,072)
Family friend			-0,255**	-0,222*	-0,159
			(0,104)	(0,101)	(0,127)
Partner friend			-0,235**	-0,273***	-0,311**
			(0,080)	(0,078)	(0,104)
Friend friend			0,026	-0,111	0,031
			(0,076)	(0,074)	(0,226)
School friend X mean age					-0,002
					(0,004)
Family friend X mean age					0,009
					(0,009)
Partner friend X mean age					0,007
					(0,006)
Friend friend X mean age					-0,003
					(0,005)
School friend X mean age^2					1,026***
(x 1000)					(0,228)
Family friend X mean age^2					-0,461
(x 1000)					(0,000)
Partner friend X mean age^2					0,190
(x 1000)					(0,000)
Friend friend X mean age^2					-0,037
(x 1000)					(0,305)
Dyadic controls					
Both male	-0,006	0,023	-0,008	0,008	0,004
	(0,044)	(0,043)	(0,044)	(0,043)	(0,043)
Mixed gender	0,121*	0,164***	0,148**	0,170***	0,169***
	(0,053)	(0,051)	(0,054)	(0,052)	(0,052)
Mean educational level	-0,022	-0,044***	-0,027	-0,042***	-0,038***
	(0,011)	(0,011)	(0,011)	(0,011)	(0,011)
Household income T1	-0,005***	-0,005***	-0,005***	-0,005***	-0,005***
	(0,001)	(0,001)	(0,001)	(0,001)	(0,001)
Distance T1	-0,032***	-0,046***	-0,031***	-0,039***	-0,039***
	(0,008)	(0,008)	(0,008)	(0,008)	(0,008)
N	5248	5248	5248	5248	5248
R^2	0,010	0,068	0,013	0,071	0,075

*p<0,05 **p<0,01 ***p<0,001 (one tailed)

Table B4.2 Unstandardised regression coefficients and standard errors of the full logistic regression model of friendship erosion on friendship investments

	Model 1 **B (logit)** (s.e)	Model 2 **B (logit)** (s.e)	Model 3 **B (logit)** (s.e)	Model 4 **B (logit)** (s.e)	Model 5 **B (logit)** (s.e)
Constant	-1,750***	-1,434***	-1,735***	-1,407***	-1,379***
	(0,158)	(0,182)	(0,161)	(0,186)	(0,188)
Mean age		-0,028***		-0,030***	-0,031***
		(0,004)		(0,004)	(0,005)
Mean age^2 (x 1000)		-0,510*		-0,430*	-0,584*
		(0,246)		(0,248)	(,324)
School friend			-0,094	-0,326**	-0,298
			(0,133)	(0,139)	(0,199)
Family friend			-0,065	0,009	0,012
			(0,253)	(0,254)	(0,324)
Partner friend			-0,234	-0,259	-0,447
			(0,204)	(0,205)	(0,293)
Friend friend			0,072	-0,072	-0,323
			(0,175)	(0,178)	(0,584)
School friend X mean age					0,018*
					(0,010)
Family friend X mean age					-0,007
					(0,020)
Partner friend X mean age					-0,011
					(0,016)
Friend friend X mean age					0,002
					(0,013)
School friend X mean age^2					0,614
(x 1000)					(0,604)
Family friend X mean age^2					-0,017
(x 1000)					(0,001)
Partner friend X mean age^2					0,815
(x 1000)					(0,001)
Friend friend X mean age^2					0,799
(x 1000)					(0,794)
Dyadic controls					
Both male	-0,330**	-0,313**	-0,340**	-0,332**	-0,331**
	(0,115)	(0,116)	(0,116)	(0,116)	(0,116)
Mixed gender	0,089	0,128	0,088	0,110	0,116
	(0,124)	(0,125)	(0,127)	(0,128)	(0,128)
Mean educational level	-0,073**	-0,111***	-0,071**	-0,103***	-0,104***
	(0,027)	(0,028)	(0,027)	(0,028)	(0,028)
Household income T1	-0,013***	-0,016***	-0,013***	-0,016***	-0,016***
	(0,003)	(0,003)	(0,003)	(0,003)	(0,003)
Distance T1	0,152***	0,142***	0,155***	0,149***	0,149***
	(0,023)	(0,023)	(0,023)	(0,023)	(0,023)
N	5248	5248	5248	5248	5248
R^2	0,036	0,061	0,036	0,064	0,066
-2 log likelihood	3065,748	3003,396	3063,627	2996,640	2991,339

*p<0,05 **p<0,01 ***p<0,001 (one tailed)