Section A1: Proposal and PI information

Proposal Acronym
DynamicsOfAltruism

General Information on the Proposal

Type of project
Support for Frontier Research – ERC Starting Grant

Call Identifier
ERC-2011-StG

Activity Code
ERC Starting Grant

Proposal Title
Dynamics of Altruism, Religion and Education

Duration in months
60

Primary ERC Review Panel
Social Sciences and Humanities

Secondary ERC Review Panel
Not applicable

ERC Keyword 1
SH2 Institutions, values, beliefs and behavior (SH2_1)

ERC Keyword 2
SH4 The human mind and its complexity

Free keywords
Altruism, religion, education, behavioral genetics

Abstract (word count: 289)
We all witness many different acts of altruism, large and small, each and every day. Acts of altruism are intriguing when they benefit others at a distance, for example by donating money to charity or volunteering for a nonprofit organization. These acts cannot be motivated by expectations to receive contributions in return from the beneficiaries. It is especially intriguing to see some individuals engage in many acts of altruism, while others are less altruistic. Why is it that some people are more altruistic than others?

Surveys consistently show that altruism is stronger among the higher educated and among religious people. But the surveys do not show whether religion and education are actually the sources of altruism. It could very well be that the higher altruism among religious and educated people is not the result of the schools and churches that people attend but the result of their personal traits – the same characteristics that made them interested in religion or achieve in education.

The research I propose will analyze to what extent religion and education influence the development of altruism in people’s lives. An almost perfect research design is to compare identical twins with different levels of education and religious affiliation. Does their level of altruism differ? Do they differ in other ways that are correlated with altruism? To what extent can these differences be attributed to religion and education? Another design – though less ideal – is to measure the tendency to engage in altruistic behavior at multiple points in people’s lives, starting at an early age. Are changes in education and religion followed by changes in altruism? Both types of designs require longitudinal data on altruism, religion and education. Using sophisticated econometric models I will analyze samples of twins and random population samples to answer the research questions.
Information on the Principal Investigator

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<tr>
<td>First Name</td>
<td>René</td>
</tr>
<tr>
<td>Title</td>
<td>Dr.</td>
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<td>Gender</td>
<td>M</td>
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<td>Nationality</td>
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<tr>
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### Section A3: Budget

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<td>PhD student 2 (full time, 36 months)</td>
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<td>Applicant (0.75 fte, 60 months)</td>
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| Total eligible costs               | €1430k |

| Requested Grant                    | €1430k |
We all witness many different acts of altruism, large and small, each and every day. Acts of altruism are intriguing when they benefit others at a distance, for example by donating money to charity or volunteering for a nonprofit organization. These acts cannot be motivated by expectations to receive contributions in return from the beneficiaries. It is especially intriguing to see some individuals engage in many acts of altruism, while others are less altruistic. Why is it that some people are more altruistic than others?

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The Principal Investigator

a. Scientific Leadership Profile (max 1 page)

The question why people display altruism has puzzled me since I started my dissertation research. To study altruism I wrote an application for a dissertation grant that was funded by the Netherlands Organisation for Scientific Research (NWO). I uncovered the major sociodemographic and personality correlates of altruism in a cross-sectional survey of the Dutch population. The level of education and religious affiliation are the two strongest and most consistent correlates. I received the 2005 best dissertation award from the Association for Research on Nonprofit and Voluntary Action. I published four dissertation chapters in international journals in various disciplines (Social Science Research, Political Psychology, Social Psychology Quarterly, and Acta Sociologica). Looking back on my dissertation articles, I realized that panel data rather than cross-sectional data are required to test hypotheses on the determinants of altruism. While I was still completing my PhD at Utrecht University, I joined the Giving in the Netherlands research design team at VU University. I convinced the other members that a panel survey should be implemented to test hypotheses on determinants of altruism more accurately. Since 2001 I have directed or co-directed the biennial Giving in the Netherlands Panel Survey (GINPS), now in its fifth wave. The survey is internationally recognized as unique and high quality.

For my postdoctoral research I obtained a personal ‘Veni’ grant of NWO, which allowed me to develop my line of research further. Using the GINPS data as well as other datasets, I developed new research tools and methods (reference 15 in my track-record below) and conducted more stringent tests of hypotheses on the impact of education and religion on altruism (reference 5 and 12).

As a postdoctoral researcher I have worked with scholars in sociology, psychology, law and economics. Working with economists (ref. 7) I learned more adequate techniques to test hypotheses on altruism that yield more accurate estimates that are often at odds with conventional insights (ref. 8,26,27). It turns out these techniques are well-suited for the analysis of data on twins as well as for the evaluation of hypotheses on causal effects of education. I also used the ‘Veni’ grant to write an exhaustive literature review on philanthropy (charitable giving), covering some 500 articles (ref. 4, 18). Finally, I coordinated an evaluation study of an educational reform in the Netherlands. I conducted an impact evaluation study of the longitudinal effects of service learning programs on civic-mindedness. The study was funded primarily by the Ministry of Education and was presented to Parliament in April 2010 (ref. 32). The impact study took about two years, during which I had little time left for other research. Yet the study did not only serve a policy purpose; eventually it also yielded novel insights into the development of educational differences in civic-mindedness (ref. 33), and the impact of education on altruism (ref. 32). On November 23, 2010, my work has been cited in 56 ISI-ranked publications (excluding self-citations).

I have served on the international Board of Advisers for the Science of Generosity request for proposals by the University of Notre Dame. I serve on the boards of leading journals in the field of Philanthropic Studies (Nonprofit & Voluntary Sector Quarterly, Voluntary Sector Review, International Journal for Nonprofit and Voluntary Sector Marketing). I have served as reviewer for more than 15 different international academic journals in economics, sociology, geography, psychology and methodology. I have also served as reviewer for research funding bodies (the Netherlands Organisation of Scientific Research (NWO) and the Economic and Social Research Council (ESRC) in the UK). At the major international conference in the field of Philanthropic Studies (the ARNOVA conference) I have served as track chair evaluating paper submissions in the past two years. I also serve as a board member of the European Research Network on Philanthropy (ERNOP), coordinating research in the network (80 members).

Recently I have been appointed as an Associate Professor and head of research at the Center for Philanthropic Studies at VU University Amsterdam. At the Center I have developed new fields of research (e.g., on immigrants, evolutionary biology and organisational psychology), and have worked to expand its international scope (e.g., by organising a conference and as research chair of the European Research Network on Philanthropy). As a ‘starter’ (PhD defense: 2004) I will develop a new, innovative line of research, combining methods and theories from economics, behavioral genetics, psychology and sociology. The ERC Starting Grant will allow me to form a multidisciplinary group of scholars committed to answer the research questions outlined above.
b. Curriculum Vitae (max 2 pages)

Current position and relevant work experience
2010 – present  
**Associate Professor, Philanthropic Studies**  
Faculty of Social Sciences, VU University Amsterdam

2008 – 2010  
**Assistant Professor, Philanthropic Studies**  
Faculty of Social Sciences, VU University Amsterdam

2003 – 2010  
**Assistant Professor, Sociology**  
Faculty of Social Sciences, Utrecht University

1997 – 2003  
**Ph.D. Candidate, Sociology**  
Faculty of Social Sciences, Utrecht University

Academic education
1997 – 2004  
Ph.D. Program at ICS/Sociology, Utrecht University

1993 – 1998  
Philosophy (Master), Nijmegen University

Sociology (Bachelor/Master), Nijmegen University

Funding ID
2009.  
“Altruism, Egoism, and Philanthropic Behavior: A National Experiment”.  
Faculty of Social Sciences, VU University Amsterdam (€6,000; Principal Investigator, joint work with Mark Ottoni Wilhelm and Lise Vesterlund).  
In this experiment (planned for 2011) we set out to test hypotheses about altruism and egoism as motives for charitable donations among a random sample of households in the Netherlands.

2007 – 2009  
“The impact of service learning programmes on civic-mindedness”.  
The Netherlands Ministry of Education, Culture and the Ministry of Health, Wellbeing and Sports (€ 209,000; Principal Investigator).  
In this research I lead a team of three researchers to assess the impact of service learning programs in secondary education on the civic-mindedness of students. The research produced three policy reports, one of which was presented to Parliament in April 2010 (ref. 32). The fieldwork included three surveys among students, two among parents and two among school coordinators.

2007.  
“The Future of Volunteering”.  
Social and Cultural Planning Office (€ 15,000; co-PI with Stijn Ruiter, Nijmegen University).  
This research resulted in two national publications on altruistic values and life course explanations of volunteering and charitable giving.

2007.  
“Generosity and Philanthropy”.  
University of Notre Dame (€ 7,600; PI, joint work with Pamala Wiepking, VU University Amsterdam).  
We wrote a comprehensive literature survey on philanthropy covering about 500 publications as a background paper for the $5 million Science of Generosity Request for Proposals. The paper, posted at the Social Sciences Research Network, was downloaded 955 times since October 2007.

2005 – 2009  
“Learning to care: explaining the effect of education on prosocial behaviour”.  
The Netherlands Organisation for Scientific Research (NWO) (€ 200,000; Principal Investigator).  
With this personal research grant from the ‘Veni’ funding scheme I examined the relationship between the level of education and prosocial behaviour. The level of competition for this grant scheme is fierce as it is designed to sponsor only the 10% best researchers in the field. The research used multiple large datasets and thus far resulted in 12 international publications and 5 national publications.

1998 – 2004:  
“Individual and situational determinants of prosocial behaviour”.  
The Netherlands Organisation for Scientific Research (NWO) (€ 100,000; Ph.D. Dissertation project; supervision: Prof. Dr. H.B.G. Ganzeboom and Prof. Dr. N.D. de Graaf).  
With this grant I wrote my dissertation, ‘Giving and Volunteering in the Netherlands: Psychological and Sociological Perspectives’. The dissertation has been cited 12 times in ISI publications and 76 times in publications indexed in Google Scholar. In 2005, I received the Gabriel Rudney Award for best dissertation from the Association for Research on Nonprofit Organisations and Voluntary Action (ARNOVA). This is the world’s largest organization of researchers in the field of philanthropic studies.
International collaboration

Ongoing:

2009- “Altruism and Egoism in a National Experiment”. In this nationwide experimental research with Lise Vesterlund (Economics, University of Pittsburgh) and Mark Ottoni Wilhelm (Economics, Indiana University, Indianapolis) we set out to test hypotheses about altruism and egoism as motives for charitable donations. A pilot study is planned for Spring 2011 in the Netherlands.

2004- “Empathy, the Principle of Care and Altruistic Behavior”. In this research with Mark Ottoni Wilhelm (Economics, Indiana University) we investigated the relations between empathy (the emotional responsiveness to others’ misfortune), the principle of care (the moral principle that one should help others in need) and a variety of altruistic behaviors (including helping behaviors as well as organised altruism). The project resulted in an international publication (ref. 7) and a new study (ref. 28).

2004 - “The Health Benefits of Volunteering”. In this research with John Wilson (Sociology, Duke University) we use data from the Longitudinal Ageing Study Amsterdam (LASA) to investigate the impact of volunteering on health using the fixed effects model. The research shows that selection is an important factor in the health-volunteering relationship, but that volunteering also has a causative effect.

Completed:

2006-2008. “Volunteering, Confidence and Philanthropy”. In this research with Woods Bowman (Economics, DePaul University) we used the fixed effects model to study the impact of volunteering on confidence in charitable organisations. We found that there is no significant impact and that the relationship between volunteering and confidence is due entirely to selection based on trust and altruistic values.

2005. “Development and Socialization of Social Capital”. In this project with Marc Hooghe (Sociology, Leuven): we found that participation in voluntary associations in adulthood is strongly related to youth participation.

Conference organization

On July 9, 2009, I organised the first Giving & Volunteering Research Conference ever held in Europe, at VU University Amsterdam. 25 research papers were presented and about 50 scholars from 15 different countries attended the conference.

Peer reviewing

I have peer-reviewed submissions to academic international journals in sociology (e.g., American Sociological Review, Social Forces, Journal for the Scientific Study of Religion, Review of Religious Research); psychology (e.g., Journal of Economic Psychology, European Journal of Personality), in philanthropic studies, (e.g., Voluntas, Nonprofit & Voluntary Sector Quarterly) and in economics (Applied Economics, Journal of the European Economic Association); for professional organisations: International Society for Third Sector Research (ISTR), Association for Research on Voluntary Action (ARNOVA); and for funding agencies: Netherlands Organisation of Scientific Research (NWO), the Economic and Social Research Council (ESRC).

Invited lectures

“Philanthropy: A Literature Review” – Dept. of Sociology, Groningen University, September 2010
“Education, Giving and Volunteering: What Have We Learned?” – Center on Philanthropy, Indiana University: Workshop in Multidisciplinary Philanthropic Studies, November 2009
“Regulation of Fundraising in the Netherlands” – Master Program of Public Services, DePaul University: Seminar, November 2006
“Social Networks and Prosocial Behavior” – Department of Sociology, Duke University: Seminar, November 2005
“The Benefits of Accreditation” – Charles University, Prague: Workshop on Certification Systems for the Nonprofit Sector in the Czech Republic, May 2005
c. Early achievements track-record (max 2 pages)

Publications in international peer-reviewed journals

<table>
<thead>
<tr>
<th>Reference</th>
<th># of citations (excl. self-citations)</th>
<th>Journal impact factor</th>
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Contributions to edited books

Selected papers presented at international conferences

Selected other publications
Extended Synopsis  

**d. Extended Synopsis of the scientific proposal (max 5 pages)**

We all witness many different acts of altruism, large and small, each and every day. Some of these acts we commit ourselves. Acts of altruism are intriguing when they benefit others at a distance, for example by donating money to charity or volunteering for a nonprofit organization. These acts cannot be motivated by expectations to receive contributions in return from the beneficiaries. It is especially intriguing to see some individuals engage in many acts of altruism, while others are less altruistic. Why is it that some people are more altruistic than others?

A wealth of evidence from surveys consistently shows that altruism is stronger among the higher educated and among religious people.\[^{A-D,33,9,2,3}\] The higher educated and the religious display more altruism than the lower educated and the non-religious. The objective of this research is

1. to estimate and explain the effects of religion and education on the development of altruism over the life course;
2. to identify the genetic and environmental factors that cause these effects.

**Previous research.** The common interpretation of the findings showing that altruism is positively correlated with education and religion is that somehow education and religion change people to become more altruistic. It is argued for instance that education makes people aware of the needs of others beyond one’s immediate social circle,\[^{E}\] provides people with the resources that facilitate engaging in altruism,\[^{3}\] and puts people in social networks in which they are more likely to be mobilized for altruism.\[^{C}\] With respect to religion it is argued that religious traditions teach people that helping others is morally right, and that religious involvement puts people in social networks in which altruism is a strongly supported and enforced social norm.\[^{9}\]

**My view.** The research I propose will challenge these ideas about the impact of education and religion on altruism. The problem with the evidence from surveys is that it does not show whether religion and education are actually the sources of altruism. It could very well be that the higher altruism among religious and educated people is not the result of the schools and churches that people attend but the result of their personal traits – the same characteristics that made them interested in religion or achieve in education.

**Methodology.** An almost perfect research design is to compare identical twins with different levels of education and religious affiliation. Does their level of altruism differ? Do they differ in other ways that are correlated with altruism? To what extent can these differences be attributed to religion and education? Another design – though less ideal – is to measure the tendency to engage in altruistic behavior at multiple points in people’s lives, starting at an early age. Are changes in education and religion followed by changes in altruism? Both types of designs require longitudinal data on altruism, religion and education. Using sophisticated econometric models such as the fixed effects regression model for panel data\[^{P}\] I will analyze samples of twins and random population samples to answer the research questions.

**Multidisciplinary approach.** The research will be conducted from a multidisciplinary approach. Current research on altruism, education and religion is conducted by researchers scattered over different disciplines, who are working in relative isolation. Biological psychologists, sociologists of religion and economists of education have specialized in their respective fields and do not cooperate enough with each other to solve questions on altruism. Yet knowledge from such different fields is required to realize a breakthrough.

**Theories.** I distinguish two broad types of explanations for the relationship between altruism and religion and education:

1. **Causation:** religion and education have a causal effect on the level of altruism;
2. **Selection:** traits of individuals predispose them to engage in religion, advance in education, and display altruism while there is no causal effect of religion and education.
Causation explanation. According to the first type of explanation, which is dominant in sociology and political science, social groups (such as religious groups) and institutions (such as education) confront people with opportunities, requests and norms to display altruistic behavior. As a result of group membership, individuals are mobilized for altruistic behaviors; they develop participation skills; and they internalize group norms supporting altruistic behavior. Also, engagement in religion and advancement in education exposes people to more opportunities and requests to display altruistic behavior. Both altruistic values and integration in networks that mobilize for altruism are likely to be shaped by education and religion, affecting, in turn, altruistic behavior.

Selection explanation. According to the second type of explanation, which emerges from psychology and behavioral genetics, people join groups that provide opportunities and requests, and endorse values that are attractive to them because they fit their capacities and personality traits. Indeed religious and higher educated individuals tend to have stronger altruistic values than the non-religious and the lower educated. Individuals allow themselves to be exposed to group socialization and mobilization by joining or remaining members of these groups. In this view, education and religion are not ‘social facts’ - exogenous phenomena that happen to be around and affect individuals beyond their will. Instead, the traits of individuals make them more likely to be exposed to group socialization and mobilization.

According to the selection explanation, altruistic values as well as altruistic behavior are dependent on specific traits of individuals that also predispose them to continue in education, to participate in religious groups, and to get mobilized for altruistic behavior. People with traits that make altruism more attractive to them find groups where altruism is practiced and preached more attractive. As a result, people with these traits engage in religion, advance in education and the same traits lead them to have more altruistic values and display more altruistic behavior. In this perspective, there is not necessarily a causal pathway from education, religion, and mobilization to altruistic values and altruistic behavior. Trait selection theory is consistent with a long series of findings in behavioral genetics showing that altruistic values, altruistic behavior, religious participation and level of education among adults have substantial genetic components.

Previous tests of causation and selection explanations. The causation explanation has never been tested adequately either because existing studies use cross-sectional datasets that do not allow for causal inferences or because inadequate statistical modeling has been applied to available panel data. Cross-sectional studies have not been able to rule out all the potential differences between individuals with different levels of education and religious affiliation. The studies using panel data have used models developed for cross-sectional data. As a result it is not clear at all to what extent and how religion and education actually influence altruism. For all we know, the true effects of religion and education may be non-existent.

New tests. To approximate an estimate of the true effects of religion and education I propose to use theories from sociology infused by insights from psychology and behavioral genetics. This is an unusual yet promising combination. One of the most important lessons of behavioral genetic analyses in the past decades is on the effects of ‘nurture’. The influence of shared environmental factors such as parental education and religion is weak at best, and moreover, it declines with age. Parents have a substantial direct influence on their children up to early adolescence, but this influence is diminished strongly after that. It is not the shared experiences of twins – growing up in the same religion or achieving a certain level of education - that contribute to the development of altruistic values and behavior. Twins are often quite different from each other, despite their shared parental environment. It is the unique environment of individuals that contributes to the development of altruistic values and behavior, in interaction with genetic factors. Individuals create and select their environments based on their own preferences that are dependent on personality characteristics.

Twin study. I propose a twin study not to prove that altruism is genetic, but to learn more about the environmental effects of religion and education. Panel data from the general population enable estimation of the total effects of education and religion. But these estimates reflect genetic and environmental effects. Twin studies yield estimates of the separate effects of genetic and environmental factors in education.
Studying monozygotic twins only, genetic effects are eliminated because they are kept constant by nature. Combining samples of monozygotic as well as dizygotic twins, the relative influence of unique and common environment can be estimated.

Impact of the research: risk and gain
The first gain of the research I propose is that it will advance the science of altruism, uncovering how altruism develops over the life course. Altruism is a fast-growing topic in many disciplines. Since 2003, several articles on altruism have appeared in Science, Nature, and other top journals. The work proposed here will benefit from the increasing interest in altruism, and will further expand this field. Specifically, both projects proposed here will have an impact on the study of altruism in the academic community. In sociology and political science, knowledge about appropriate models for panel data analysis is lagging behind, favoring causation explanations. A second impact of the research is that it will make the usefulness of behavioral genetic analysis more widely known in sociology. Recently, sociologists have become more open to behavioral genetics and biological approaches to social phenomena. The research will extend this development. The collection of new data on altruism among twins will be of high value for future research beyond the scope of the present proposal. Specific genes may be identified that contribute to the development of altruism in interaction with environmental factors, such as church attendance in the case of voting.

The research is not without risk, however. The first risk is that the analyses in project 1 may show that there are no significant changes in altruism associated with changes in the level of education and religious involvement. In this case, the research will seek to identify the omitted variables that cause the spurious correlation between education, religion and altruism. The second risk is that the period of time covered in the GINPS or the NTR is not long enough to observe substantial changes in altruism, religion or the level of education. This risk lowers the statistical power for hypotheses tests using panel survey data. To assess this risk, a statistical power analysis will be conducted at the start of the research. If the power turns out to be too low, additional data will be collected using retrospective surveys in which respondents report about their altruistic behavior at earlier points in their lives.

Data and methods
The research I propose consists of two projects. In my role of applicant I will coordinate the data collection and analysis in both projects.

Project 1: Dynamics of Altruism among Adults
This project will use panel data from a random sample of individuals in the Netherlands to estimate the total effects of religion and education on altruism. The research will also identify the variables that cause the correlation between religion and education. The source of data is the Giving in the Netherlands Panel Study (GINPS). The GINPS is a random sample of the Dutch population surveyed biennially. I have coordinated the GINPS most of the time since 2001. The survey includes prospective panel data on a variety of altruistic behaviors, including charitable giving, volunteering, blood donation, and helping behaviors. In addition, the surveys include data on altruistic values, mobilization, religion and education. Fixed effects regression models will be used to estimate the causal effects of education and religion on altruism.

This project will be conducted by a Ph.D. candidate at the Center for Philanthropic Studies at VU University Amsterdam, supervised by the applicant and Dr. Marjolein Broese van Groenou at the Department of Sociology at VU University, an expert in the analysis of panel data affiliated with the Longitudinal Ageing Study Amsterdam (LASA). Results of the research on the development of altruistic values and behavior in the life course, on longitudinal effects of education and religion, and on the effects of altruistic behavior on altruistic values will be published in international journals in sociology, psychology and economics.

Project 2: Religion, Education and Altruism: A Behavioral Genetic Study
This project will use data on twins to identify the causal factors that link education and religion to altruism. Though panel studies among random population samples provide a powerful design to disentangle
causation and selection, they are not the most powerful design. The superior design is a panel study among monozygotic twins. Because these twins share 100% of their genes with each other, they can be considered genetic copies of each other. Any within-MZ twin differences that appear in cross-section must be due to environmental effects or interactions of environmental and genetic effects. Even among monozygotic twin pairs, one twin may achieve a lower level of education than the other because of lower levels of emotional stability and cognitive ability that have non-genetic origins. If education has a causal, non-genetic effect on altruism one would expect the lower educated twin to be less altruistic than the higher educated twin. The argument for religion would be similar: the less religious twin should be less altruistic. First within-twin differences in religion and achievement in education will be ascertained. Do twins discordant with respect to religion and education display different levels of altruism? And if so, how are differences in altruism within discordant twins correlated with other characteristics that differ within the same twin pair? Next the development of altruism over time will be studied in a panel survey among twins.

Project 2 will be conducted by a Ph.D. candidate at the Center for Philanthropic Studies at VU University Amsterdam in close collaboration with the applicant and Professor Dr. Dorret Boomsma at the Department of Biological Psychology, who is leading the NTR. Boomsma is an international authority in the field of behavioral genetics, in which she has published proficiently. Boomsma received the prestigious Dutch Spinoza prize in 2002 and the ERC Advanced Investigator Grant in 2008. In project 2, papers will be written jointly with internationally respected experts on the social psychology of altruism with whom I have worked before: professors Paul van Lange and Mark van Vugt at the Department of Social Psychology at VU University. Results of the research will be published in international journals in behavioral genetics, sociology, psychology and economics.

In a previous survey among twins in the Netherlands Twin Register a measure of volunteering was included. The Netherlands Twin Register is a longitudinal study of twins, their parents, and siblings. Repetitions of the volunteering measure enable a study of changes in volunteering over a five year period. The longitudinal design of the NTR allows for a repetition of the altruism measures we propose below in the future. This will allow researchers to track changes within individuals. The head of the NTR, Dorret Boomsma, has already invested in collection of data on volunteering, and she welcomes future data collection and analyses on altruism.

In a multiple regression framework, comparisons of monozygotic twins can be made using the fixed effects regression model, eliminating unobserved heterogeneity, and allowing for causal inference. Such an analysis enables tests on causal and non-genetic effects of education and religion, that are often overestimated in conventional models.

Data collection: GINPS and NTR
To extend the longitudinal scope of the analyses in project 1, funding is requested for a new wave of data collection for the GINPS. At the start of the project, five waves of data will be available. A sixth wave is planned for 2012, for which co-funding is requested. Most of the funding required is already secured from the Department of Justice. The amount requested here completes funding so that the survey includes additional questions on altruistic values, and on social networks, health subjective well being as consequences of altruistic behavior. To enable longitudinal analyses among twins in project 2, funding is requested for the collection of a second wave of data on volunteering. Also new data will be collected on altruistic values and altruistic behaviors, required to answer the research questions.

Host institute and local collaboration
The work will be coordinated by Dr. René Bekkers, Associate Professor and Head of Research at the Center for Philanthropic Studies at VU University. The department is one of leading centers of research on philanthropy in the world. The GINPS is a widely respected unique source of data on philanthropy and volunteering. The Department is very well connected to scholars in philanthropic studies world wide through the European Research Network on Philanthropy (ERNOP) and individual contacts. Recently, Dr. Pamala Wiepking, a close colleague from the Center, received a Veni-grant from the Netherlands Organisation for Scientific Research for cross-national comparative research on philanthropy.
Local collaboration at VU University involves colleagues at Sociology, Biological Psychology, and Social Psychology. Project 1 will be conducted by a PhD candidate, supervised by the applicant in collaboration with Dr. Marjolein Broese van Groenou at the Department of Sociology at VU University, an expert in the analysis of panel data (LASA). Project 2 will be conducted by a PhD candidate, supervised by the applicant and Professor Dr. Dorret Boomsma at the Department of Biological Psychology, who is leading the NTR. Boomsma is an international authority in the field of behavioral genetics, in which she has published proficiently. Boomsma received the prestigious Spinoza prize in 2002 and the ERC Advanced Investigator Grant in 2008. In project 2, papers will be written jointly with internationally respected experts on the social psychology of altruism with whom I have worked before: professors Paul van Lange and Mark van Vugt at the Department of Social Psychology at VU University. The collaboration in this project gives unique opportunities for cross-disciplinary research discovering the interaction between genetics and social environments created by religion and education.

Feasibility
The research I propose is effective and attainable as most of the groundwork is already in place. Since the GINPS started at VU University in 2002, I have acquired expertise in panel data collection, processing and analysis. Project 1 will build on the data already collected. Project 2 will use NTR data collected earlier. Data to be collected in both GINPS and NTR will be extensions of fieldwork that is already planned and for a large part funded. The infrastructure created earlier allows for an effective and efficient collection of a new wave of data. Collecting data in these surveys is relatively cheap. However, without the level of funding budgeted in the current application the data cannot be collected.

Literature references
Section B2: Scientific proposal

(max. 15 pages)

a. State of the art and objectives

The objective of this research is (1) to estimate and explain the effects of religion and education on the development of altruism over the life course; (2) to identify the genetic and environmental factors that cause these effects.

Altruism is defined here as the tendency to benefit other individuals at a cost to oneself. The word ‘tendency’ is used to refer not only to the behavior itself that is altruistic, but also to the latent traits that predispose individuals to display altruistic behavior. Specifically, the research I propose will examine altruistic values and exposure to solicitations for altruism as traits that influence altruistic behavior. The definition of altruism includes many forms of human behavior. People help their neighbors, friends and family, and even strangers by doing things for them, or indirectly by giving them access to their resources. Such examples of altruism are often called ‘helping behavior’ or ‘social support’. Also, people give time to nonprofit organizations by volunteering, donate money to charitable organizations and give blood. These examples of altruism all involve an intermediary organization that channels the help offered by individuals to the beneficiaries. In this proposal I focus on such organized altruism. Although helping friends or family members also qualifies as altruism according to the above definition, this type of altruism is more easily explained by kinship altruism, direct reciprocity and exchange.

In the case of organized altruism, however, people usually do not have direct contact with the beneficiaries, and they cannot be sure that their efforts will be compensated in the future. In this case, altruism does not hold the promise to the helper that once she will be the beneficiary of an act of reciprocated altruism. Nevertheless, we observe a lot of organized altruism in everyday life that seems to be at odds with a simple egoistic model of man. Yet the questions I seek to answer are not so much about the absolute level of organized altruism, but rather on the determinants of altruism. Specifically I will investigate the genetic and environmental factors that cause the level of education and religious involvement to be associated with altruistic behavior.

Theoretical overview

Altruism has been studied extensively in many scientific disciplines. Empirical studies on the socio-demographic correlates of organized altruism reveal a fairly consistent pattern of results for two characteristics: the level of education and religious affiliation and engagement. Higher educated individuals display more organized altruism than lower educated individuals, and more religious individuals display more altruism than less religious individuals.

Broadly speaking, there are two possible explanations for the relations between altruism, education and religion. First I will formulate them as alternative ideal types. Later I will discuss the potential complementarities between the two explanations. The first explanation assumes that religion and education change people, and that due to these changes, people become more altruistic. Because the explanation assumes a causal role for religion and education, it is called the causation explanation. Figure 1 shows the causal relationships between religion, education, and altruistic behavior. The figure also includes two variables that are most likely to be mediating the influence of religion and education: altruistic values and mobilization.

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<th>Causation explanation</th>
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Figure 1. Causation explanation
The second explanation assumes that individual traits predispose people to engage in religion and education as well as in altruism. People select, evoke and manipulate environments that fit their own traits. In this explanation there is no causal influence of religion and education on altruism. Instead, individuals select themselves and are selected into religion, education and altruism because of specific traits. In this explanation the relationship between altruism, religion and education is spurious. Because this second explanation assumes no causal role for religion and education, but a selection based on specific traits, it is called the selection explanation. Figure 2 shows the causal relationships between religion, education, and altruistic behavior. There are no causal effects of education and religion on altruistic behavior. Instead, there are traits that predispose people to display altruism that also influence the level of education and religion among individuals. Note that in this model altruistic values and mobilization influence altruistic behavior, as in figure 1 above. However, religion and education have no direct influence on altruistic values, mobilization or altruistic behavior in the selection model.

![Figure 2. Trait Selection Theory Causal Model](image)

To dissect the relationship between altruism and religion and education successfully, I build on insights from research in many different disciplines. In this paragraph I describe these insights in general terms, separately for education, religion and altruism. Below I will discuss the evidence in more detail.

**Education.** In the sociology of education and political science education the causation explanation dominates as education is viewed as a formative social influence on individuals. In this view, education is shaping not only the preferences of people – expressed in their outlook on fellow citizens and their social and political values – but education is also enhancing their resources and skills. Studies in this area, however, seldom answer the question when and why people invest in education. This question is answered by the selection explanation. Why do some individuals achieve higher levels of education than others? Labor economics explicitly deals with this question. In the investment model of human capital, individuals determine their level of investment in education based on the expected costs and benefits. The pay-off from higher grades and achieving a higher level of education consists of higher earnings on the labor market, which depend on the scarcity on the labor market. In economics, the costs are assumed to consist of the amount of money required to achieve a specific degree in the form of registration fees for academic programs. Scholars in personality psychology have mapped traits of individuals that affect the subjective costs and benefits of academic achievement. The level of effort required to perform well in education depends not only on cognitive ability, but also on basic personality traits such as openness to experience, conscientiousness and emotional stability, and on more specific traits such as self-esteem. Studies in behavioral genetics have shown these traits to be heritable to a large extent, as monozygotic twins are often much more similar with respect to these traits than dizygotic twins. Because personality traits are also very stable over time, the educational system can be viewed as a big sorting machine that awards the highest grades and degrees to the most talented.

**Religion.** The state of the art in research on the relationship between religion and altruism follows the disciplinary structure outlined above. In the sociology of religion and political science churches and other religious institutions are viewed as a formative social influence on individuals. In this view, religion is shaping not only the preferences of people but also their resources and skills. As in the case of education,
however, these studies rarely answer the question when and why people invest in religion. Why are some people more strongly engaged in religion than others? While scholars in the sociology of religion have focused on denominational differences, scholars in personality psychology have mapped traits of individuals that affect the subjective costs and benefits of engagement in religion. Religion is more or less attractive for people depending on their traits. In addition to basic personality traits such as agreeableness, extraversion, openness to experience, conscientiousness and emotional stability, trust and empathy are more specific traits that determine the level of engagement in religion. Also these traits have been shown to be heritable to a large extent by studies in behavioral genetics.

Altruism. The structure of the ‘state of the art’ in research on altruism is very different from the two structures above. In the 1980s, a separate field of research has emerged that studies the donation of money to nonprofit organizations under the name of philanthropic studies. Research in this field tends to include religion and education as predictor variables without identifying or testing arguments on why these variables are related to charitable giving. In behavioral economics a proliferating body of literature has studied altruism using experimental methods, largely ignoring individual heterogeneity in altruism other than as a source of error. In social psychology trust, empathy, and the principle of care have been measured explicitly as individual characteristics that influence altruism also in experiments, yet this body research has ignored sociodemographic correlates such as religion and education. Studies in personality psychology have identified cognitive ability and extraversion as traits that promote altruistic behavior. In economic sociology the organization of altruism has been studied as a context variable that influences the characteristics of the pool of donors. Empirically, however, education and religion are important predictors in most contexts. Finally, life course studies have shown the influence of social roles on activity in nonprofit organizations.

Literature review
Now I will discuss the state of the art in the academic literature on altruism, religion and education.

Causation explanation
First I will review the literature supporting the causation explanation, identifying altruistic values and mobilization as mediating variables in the relationship between religion, education and altruistic behavior.

Socialization of altruistic values. In many social situations people face norms proscribing them to behave altruistically. For long, the family, education and religion have been considered the three main institutions that assume responsibility to socialize their members.[18,19] Today altruistic values are still viewed as a result of socialization of these values in families, schools and churches.[20-22] Religion is deemed to be of particular importance for the socialization of altruistic values.[101] All the major world religions emphasize the value of helping others. The few studies that have actually measured altruistic values have found that indeed religious persons endorse altruistic values more strongly than non-religious individuals.[9,24] One study looked specifically at differences between religious groups in the Netherlands, finding that members of religious groups in which the average level of engagement is higher have stronger altruistic values.[9] This suggests that group norms influences the level of endorsement of altruistic values by individual members of the group. The same study found that differences in the level of altruism between the non-religious and religious persons - as well as differences between members of different religious denominations - are partly the result of differences in altruistic values.[9]

The influence of education on altruistic values is less clear. There are few schools beyond compulsory education that actively seek to encourage altruistic values among students. Thus far no studies have investigated the relationship between education and altruistic values. However, there are many studies on the relationship between education and other social attitudes and values. One study found a sizeable positive relationship between education and ‘social attitudes’ including political efficacy and tolerance.[27] Other studies have also documented relationships between education and social attitudes such as social responsibility,[25] trust,[104,105] and tolerance.[110] Though many of these social attitudes have been argued to be associated with civic engagement, none of the scales actually refers to the importance of helping others.
Socialization explanations have been criticized not only on theoretical grounds but also on the basis of indirect empirical tests. Yet there is not much empirical research that allows for a direct test of socialization theories, because data on altruistic values are rarely collected in population surveys in addition to data on altruistic behavior. Life course studies have focused on stratification outcomes, traditional family values and political preferences. Studies including measures of altruistic values almost always have a cross-sectional design. As a result, the basic hypothesis that exposure to a social norm proscribing altruism—e.g., in religion, education, and family relations—promotes the development of altruism throughout the life course remains to be tested. Do people who become more religious and continue in education really become more altruistic over time? We simply don’t know yet. Also the hypothesis that altruistic values cause altruistic behavior needs further testing. A similar criticism may be directed at mobilization theories. Mobilization may not only be a cause but also a consequence of altruistic behavior. Also altruistic values may elicit requests for contributions. To say the least, it is likely that the direction of causality in the relation between mobilization and altruistic behavior runs both ways. Therefore I propose to conduct life course analyses of altruism and collect additional data to repair the lack thereof. Although previous research has not provided strong support for the socialization explanation, the hypothesis on altruistic values from the causation explanation to be tested in the research I propose is:

**H1. The relationship between education and religion on the one hand and altruistic behavior on the other hand is partly mediated by altruistic values.**

*Mobilization: opportunities and requests.* Social groups have an impact on the altruistic behavior of individuals not just through socialization of altruistic values, but also through mobilization for altruistic behavior. Groups create opportunities and organize requests to display altruistic behavior. These mobilization effects are often contrasted with socialization effects, though the two are not necessarily mutually exclusive. Several studies have found that religious people do not have a stronger inclination to donate and volunteer once they are asked. These findings call the altruistic values explanation into question. But engagement in religion exposes people to opportunities and requests to display altruistic behavior. More frequent church attendees are confronted with a higher number of solicitations for charitable contributions and are more likely to be asked to volunteer, also for secular organizations. Religious communities are pools of potential donors and volunteers that can be accessed relatively easily. Religion functions as an institution channeling citizens to meet social needs, transforming altruistic values into altruistic behavior.

Achieving a higher level of education is also likely to increase exposure to opportunities and requests for altruistic behavior. People with higher levels of education may be more actively engaged in altruistic behavior because they have larger networks, increasing exposure to mobilization attempts. Opportunities to display altruistic behavior in formal settings occur also in the spheres of family and work, and they may also explain the effects of religion and education. The hypothesis on mobilization from the causation explanation is:

**H2. The relationship between education and religion on the one hand and altruistic behavior on the other hand is partly mediated by mobilization.**

Yet mobilization is not the whole story behind the relationship between education and altruistic behavior. If asked, the higher educated express a stronger inclination to donate money and volunteer time for charitable causes. Taking exposure to requests into account, higher levels of education are still associated with higher levels of altruistic behavior. It may be argued that apparently education instills altruistic values or some other preference or skill that makes people behave more altruistically. The alternative explanation, of course, is that education selects for traits that also produce altruistic behavior.

**Selection explanation**

The selection explanation assumes that pre-existing differences between individuals determine their level of education and religion as well as their level of altruism. Take the example of religion. It is unlikely that one would join a religious group in which members are expected to volunteer a lot and to donate 10% of their wealth unless one is prepared to do so. Likewise, people who do not feel at ease with such strict social norms on altruism are more likely to leave religious groups where and when these norms are strongly
endorsed and socially enforced. Thus, the decision to participate in religious groups is partly dependent on
the willingness to display the behaviors that are proscribed by the group’s norms, e.g. on altruistic
behavior. Yet researchers in many disciplines, including sociology, political science and philanthropic
studies, commonly include religious denomination and church attendance as predictor variables in
regression models of charitable giving and volunteering. Their relationships are interpreted as exogenous ‘effects’.

According to the selection explanation, altruistic values as well as behavior are dependent on specific traits
of individuals that also predispose them to continue in education, to participate in religious groups, and to
get mobilized for altruistic behavior. People with traits that make altruism more attractive to them find
groups where altruism is practiced and preached more attractive. As a result, people with these traits
engage in religion, advance in education and the same traits lead them to have more altruistic values and
display more altruistic behavior. In this perspective, there is not necessarily a causal pathway from
education, religion, and mobilization to altruistic values and altruistic behavior (see figure 2 above).

A similar problem can be found in studies regressing altruistic behavior on education. Though
traditionally social scientists have viewed education as ‘the universal solvent’, recent studies have
discovered that individual traits of students are much more important than their experiences in the
classroom. As one scholar in political science put it: “Differences in political sophistication evident after
people attend college are already in place before anyone sets foot in a college classroom”. Similar
findings emerge from a study on civic engagement in the UK, though a small positive effect of education
remained after selection was taken into account. The key question of course is whether such a pattern is
also behind the correlation between education and manifestations of altruism, such as the donation of
money or volunteering. Using cross-sectional data it is impossible to determine the timing of events in the
relationship between education and altruism.

**Traits selected for in education.** Not all individuals feel at home in schools. Some people have more fun in
education than others. Cognitive ability and emotional stability are likely to promote achievement in
education, in addition to traits like openness to experience. Omitting a discussion of emotional
ability and openness to experience, I focus here on cognitive ability. Though cognitive sophistication is
sometimes viewed as the result of more years of schooling, it is also a trait that determines academic
achievement. One study that explicitly sought to estimate the effect of education on cognitive ability
found a strong influence of prior levels of ability on the level of education, but no evidence for a feedback
loop from education to cognitive ability. We do know, however, that cognitive ability is positively
related to altruistic behavior. One of the potential reasons behind this link is that cognitive
ability contributes to the potential for internalization of moral values. In developmental psychology,
cognitive ability is identified as an important factor in moral development. At the highest stage of moral
development, altruistic values are internalized such that group members behave altruistically when there is
no chance of punishment for violations or reward for conforming to the norm. It may be that education
indeed fosters altruistic values by expanding general knowledge and increasing awareness of social
needs over and above the effect of cognitive ability. Yet no study to date has tested this explanation
empirically. Controlling for cognitive ability, relationships between the level of education and charitable
giving as estimated from cross-sectional data tend to diminish. Using panel data from the WLS, one
study found that IQ measured in high school is positively related to volunteering thirty five years later.
However, education still has a positive relationship with volunteering when selection for cognitive ability
is taken into account. The hypothesis that will be tested is:

**H3.** The relationship between education and altruistic behavior is partly spurious, due to the omission of
cognitive ability, emotional stability and openness to experience as confounding variables.

**Traits selected for in religion.** A religious world view that stresses compassion for others is more appealing
to people who easily empathize with others and who are trusting of others. Several studies suggest that
indeed trust and empathy are associated with higher levels of religious participation. Religious groups
and education are likely to select for these traits. Empathy and trust are robust and fairly strong predictors
of altruistic values and behavior. Relationships of volunteering with empathic concern – a
strong correlate of altruistic values become weaker when church attendance is included, while the
reverse is not true. Behavioral genetic studies show that religiousness as well as altruistic behavior are partly heritable. One study concluded about the relationship between religiousness and altruistic behavior that "these connections were partly because the same genes influence differences in [...] altruistic behavior that influence differences in religiousness." This finding is consistent with the selection explanation, but not with the socialization explanation. Specific genes may be identified that contribute to the development of altruism. A study on voter turnout, theoretically related to altruistic values, identified monoamine oxidase A (MAOA) and a serotonin transporter gene (5HTT) as sources of genetic variation in voter turnout. Also, a study on two specific measures of altruistic values and behaviour identified the oxytocin receptor (OXTR) gene as a source of altruism. The hypothesis that will be tested is:

**H4. The relationship between religion and altruistic behavior is partly spurious, due to the omission of trust and empathy as confounding variables.**

**Altruistic Values and Behavior**

Scholars and policy makers alike have often argued that altruistic values and behavior are like ‘well-tossed spaghetti’, i.e., have reciprocal effects. However, in almost all studies, the data and models used do not properly use (or even lack) information on the timing of events and therefore cannot take selection of individuals into account. As a result, these studies have probably overestimated the effects of altruistic behavior. Those that did use more sophisticated models on panel data found no support of group socialization. Instead, altruistic values and generalized social trust increase the likelihood of starting to volunteer because they increase the likelihood of being asked to volunteer. Again, these findings are consistent with the selection explanation, but not with the causation explanation. Generalizing these findings to altruistic behavior in general, the hypothesis that will be tested is:

**H5. The relationship between altruistic behavior and altruistic values is due to a causal effect of values on behavior and not vice versa.**

A further argument for this hypothesis is the need for justification of one’s actions. Engagement in altruistic behavior may promote altruistic values not only through group socialization, but also through a parallel psychological process of self-justification. After one has displayed altruistic behavior, it is difficult to deny that helping others is important. If only to reduce cognitive dissonance and to justify one’s actions, one would expect altruistic behavior to promote altruistic values.

**Complementarity of selection and causation**

Though the selection and causation explanation have been presented above as mutually exclusive, selection and causation may be operating at the same time. To some extent individuals may be affected by the groups they are in, and at the same time, to some extent people may select groups that fit their traits. In fact, the empirical results of most of the studies reported above reveal such a pattern. These studies illustrate the power of prospective panel data to disentangle causes and consequences in the relation between altruistic values and altruistic behavior and their correlates. Recently, sociologists have become more open to behavioral genetics and biological approaches to social phenomena. The research will feed this development. In two research projects this fruitful line of research will be extended, seeking an answer to the question to what extent religion and education are causal factors in the development of altruistic values and behavior, and how their effects can be explained.

**b. Methodology**

This project uses panel data to estimate the relationships between altruism, education and religion. The advantage of panel data is that the timing of events can be observed, i.e., whether changes in altruism precede or follow changes in education and religion. Causes precede effects; changes in altruism that precede changes in education and religion cannot be caused by them. Panel data alone, however, are not a panacea for establishing the causal relationships between altruism, education and religion. Estimates from panel data are easily biased when inadequate model specifications are used, which is actually common practice in social research. Models developed in econometrics have allowed for more accurate estimates of the causal relationships among variables in panel data.

A conventional regression model in social research applied to cross-sectional data is of the following form:
In equation (1) $y_i$ is the dependent variable (altruism); $z_i$ is the independent variable of interest (i.e., education, religion) with parameter $\gamma$; $x_i$ are the other independent variables in the analysis with parameters $\beta$; and $\varepsilon_i$ is the error. In cross-sectional analyses omitting variables that are correlated with $y_i$ and $z_i$ bias the estimate of $\beta$. In panel data multiple observations are available of the same individuals over time. With panel data estimation, a dummy variable for each individual is included in the estimation that catches all the omitted variables. The following equation is estimated with observations of individuals $i$ across different time periods $t$:

$$ y_{it} = \beta x_{it} + \gamma z_{it} + \eta_i + \varepsilon_{it} $$

A fixed effect (dummy) is included for each individual $i$ representing all unobserved variables that are individual specific, like cognitive ability. This eliminates the omitted variable bias due to unobserved individual specific variables. The impact of explanatory variables like education and religion is now identified by their change over time. This becomes clear by subtracting the value of $y$ in period $t-1$, $y_{i,t-1}$ from the value in period $t$, $y_{i,t}$, expressed in equation (3) by the variable $\Delta$:

$$ \Delta y_{it} = \beta \Delta x_{it} + \gamma \Delta z_{it} + \Delta \varepsilon_{it} $$

Identification now comes from changes in the explanatory variables. The individual fixed effect drops from the equation as it is equal in the two time periods.

Panel data from random population samples help to identify the total effects of religion and education, eliminating selection based on individual traits. They will yield more accurate estimates that will be smaller than the estimates based on conventional analyses of cross-sectional data. Though panel studies among random population samples provide a powerful design to disentangle causation and selection, they are not the most powerful design. The superior design is a panel study among monozygotic (MZ) twins. Because these twins share 100% of their genes with each other, they can be considered genetic copies of each other. Any within-MZ twin differences that appear in cross-section must be due to environmental effects or interactions of environmental and genetic effects. Even among monozygotic twin pairs, one twin may achieve a lower level of education than the other because of lower levels of emotional stability and cognitive ability that have non-genetic origins. If education has a causal, non-genetic effect on altruism – as predicted by the causation explanation - one would expect the lower educated twin to be less altruistic than the higher educated twin. Contrary to this expectation, a small study in New Zealand found that differences in education within twin-pairs were inversely related to volunteering: the higher educated twin tended to volunteer less. The argument for religion would be similar: the less religious twin should be less altruistic. Twin studies yield estimates of the separate effects of genetic and environmental factors in education. Studying monozygotic twins only, genetic effects are eliminated because they are kept constant by nature. Combining samples of monozygotic as well as dizygotic (DZ) twins, the relative influence of unique and common environment can be estimated.

The logic of the fixed effect model can also be applied to twins. In this application an additional level of analysis is introduced next to time and individuals: the twin pair. Eliminating differences between twins in genes, only differences in environments remain. In a multiple regression framework, comparisons of monozygotic twins can be made using the fixed effects regression model, eliminating unobserved heterogeneity, and allowing for causal inference. Such an analysis enables tests on causal and non-genetic effects of education and religion, that are often overestimated in conventional models.

To show the importance of twin data, consider observations on a variable of interest like altruism $y_{im}$ in a twin pair consisting of members $m = 1, 2$. 

\[ y_i = \beta x_i + \gamma z_i + \varepsilon_i \]
\[ y_{i1} = \beta x_{i1} + \eta_i + \epsilon_{i1} \]
\[ y_{i2} = \beta x_{i2} + \eta_i + \epsilon_{i2} \]  

Equation (4)

\( x_{im} \) are explanatory variables that are different across twin pairs and \( \eta_i \) is a fixed effect catching all characteristics that are twin specific (i.e., equal for the twin members). By comparing outcomes for twins and hence taking the difference, it is clear that twin specific fixed effect drops out.

\[ y_{i1} - y_{i2} = \beta(x_{i1} - x_{i2}) + (\epsilon_{i1} - \epsilon_{i2}) \]  

Equation (5) controls for all factors that are equal across the twins, such as genetic effects among monozygotic twins.

By following twins over time, one can go one step further and also control for individual characteristics that differ across the two twins, but constant over time and for twin characteristics that are varying over time. Consider the following equation for the outcome of twin members \( m = 1, 2 \) for twin pair \( i \) in period \( t \), \( y_{imit} \):

\[ y_{imit} = \beta x_{imit} + \eta_i + \phi_i + \epsilon_{imit} \]
\[ y_{i2t} = \beta x_{i2t} + \eta_i + \phi_i + \epsilon_{i2t} \]  

Equation (6)

Taking first the difference over time and then difference between the two twins, one gets:

\[ \Delta_m \Delta_t y_{imit} = \beta \Delta_m \Delta_t x_{imit} + \Delta_m \Delta_t \epsilon_{imit} \]  

Hence, both the twin specific effects that can vary over time and the individual effects drop out and can thus be controlled for.

Longitudinal analyses of twins will show how environments affect altruism over the life course. This is important not just because such analyses will show which variables the individual level are mediating the effects of religion and education. Also the analyses will show how environmental effects change over the life course. Previous studies have found that shared environments have much larger effects in childhood than in adolescence and adulthood. This is probably a result of the increasing level of freedom for individuals to select their own environments. To capture this, the coefficient \( \beta \) can be made time dependent. This implies taking only the difference between twins and estimating for different periods separately (or using a so called SUR framework to account for correlation of the error terms over time estimating for all time periods at once). The individual fixed effects have to be omitted now, because the equation is estimated for each period separately:

\[ y_{i1t} - y_{i2t} = \beta_t(x_{i1t} - x_{i2t}) + (\epsilon_{i1t} - \epsilon_{i2t}) \]  

Equation (7)

c. Resources

The research I propose consists of two projects (see figure 3). Project 1, the panel data research, will estimate the total effects of religion and education on altruism and identify the variables that cause the correlation between religion and education. Project 2, the twin data research, will identify the genetic and environmental determinants of altruism. In my role of applicant I will coordinate the research and the data collection in both projects. Project 1 will be conducted by a Ph.D. candidate at the Center for Philanthropic Studies at VU University Amsterdam, supervised by the applicant and Dr. Marjolein Broese van Groenou at the Department of Sociology at VU University, an expert in the analysis of panel data affiliated with the Longitudinal Ageing Study Amsterdam (LASA). Results of the research on the development of altruistic values and behavior in the life course, on longitudinal effects of education and religion, and on the effects of altruistic behavior on altruistic values will be published in international journals in sociology,
psychology and economics. Project 2 will be conducted by a Ph.D. candidate at the Center for Philanthropic Studies at VU University Amsterdam in close collaboration with the applicant and Professor Dr. Dorret Boomsma at the Department of Biological Psychology, who is leading the NTR. Boomsma is an international authority in the field of behavioral genetics, in which she has published proficiently. Boomsma received the prestigious Spinoza prize in 2002 and the ERC Advanced Investigator Grant in 2008. In project 2, papers will be written jointly with internationally respected experts on the social psychology of altruism with whom I have worked before: professors Paul van Lange and Mark van Vugt at the Department of Social Psychology at VU University. Results of the research will be published in international journals in behavioral genetics, sociology, psychology and economics.

<table>
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<tr>
<th>Year</th>
<th>Project 1: Dynamics of Altruism among Adults</th>
<th>Project 2: Religion, Education and Altruism: A Behavioral Genetic Study</th>
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<tr>
<td>2011</td>
<td>Identification of selection variables: GINPS12</td>
<td>Project Design: NTR12</td>
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<td>2012</td>
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Figure 3. Schedule for research projects

Project 1: Dynamics of Altruism among Adults
In project 1, longitudinal panel data will be analyzed that include measures of altruism. The source of data is the Giving in the Netherlands Panel Study (GINPS). The GINPS is a random sample of the Dutch population (baseline n = 1,964) surveyed biennially. I have coordinated the GINPS most of the time since 2001. The survey includes prospective panel data on a variety of altruistic behaviors, including charitable giving, volunteering, blood donation, and helping behaviors. In addition, the surveys include data on altruistic values, mobilization, religion and education. Because changes in the level of education are increasingly rare as people age, the recent waves include oversamples of young adults (18-25 years). These respondents are more likely to achieve higher levels of education as time goes by. While changes in religious affiliation are rare, changes in the frequency of church attendance are more common among GINPS respondents. Still the number of changes is limited. To extend the longitudinal scope of the analyses using the GINPS, funding is requested for new waves of data collection. At the start of the project, five waves of data will be available. A sixth, seventh and eighth wave are planned for 2012, 2014, and 2016, for which funding is requested. The new waves will not only include measures of concurrent altruism, religion and education, but will also include retrospective measures. The GINPS already includes measures of changes in variables that are likely to be correlated with changes in religion and education, such as marriage, family formation, and other life events.

This project will be conducted by a Ph.D. candidate at the Center for Philanthropic Studies at VU University Amsterdam, supervised by the applicant and Dr. Marjolein Broese van Groenou at the Department of Sociology at VU University, an expert in the analysis of panel data affiliated with the Longitudinal Ageing Study Amsterdam (LASA). Results of the research on the development of altruistic values and behavior in the life course, on longitudinal effects of education and religion, and on the effects of altruistic behavior on altruistic values will be published in international journals in sociology, psychology and economics.

Project 2: Religion, Education and Altruism: A Behavioral Genetic Study
This project will use a panel survey among twins to study of the development of altruism over time in relation to changes in education and religion. The main source of data is the Netherlands Twin Register (NTR). The NTR is a unique longitudinal study of twins, their parents, and siblings. The head of the NTR, Dorret Boomsma, has already invested in collection of data on volunteering, and she welcomes
future data collection and analyses on altruism. A strong advantage of the NTR is that it is an ongoing longitudinal study with a wide variety of measures available.

A repetition of the volunteering measure included in the previous NTR wave allows for a study of changes in volunteering. The longitudinal design of the NTR allows for a repetition of the altruism measures we propose below in the future. This will allow researchers to track changes within individuals. To do so, funding is requested for the collection of two more waves of data on volunteering (2012 and 2016). Enlarging the time span, more twins in the panel will have advanced through education, and also the variance observed within twin pairs will increase. In the new waves of data collection also measures of altruistic values and other altruistic behaviors beyond volunteering will be included.

Using the NTR and other twin data, first within-twin differences in religion and achievement in education will be ascertained. Next the question will be answered whether twins discordant with respect to religion and education display different levels of generosity. If so, the third question that will be answered in project 2 is how differences in generosity within discordant twins are correlated with other characteristics that differ within the same twin pair. At this stage the results from project 1 will be used to design the analyses. Individual traits identified as sources of selection bias in project 1 will be included in the analyses of the twin data. As the NTR is an ongoing study, measures of many potentially relevant traits have already been collected. If the research in project 1 identifies traits that are not yet included in the NTR, measures of these traits will be included in future NTR waves. Thus the NTR data will test hypotheses 3 and 4 on selection and hypotheses 1 and 2 on mediation.

Budget
The budget for the research I propose includes the salaries for the two Ph.D. candidates as well as my own salary for a half time appointment. The travel budget covers attendance of at least one international conference per year for the applicant and Ph.D. candidates. The budget also includes fees for subcontractors to collect data necessary for the project: the Giving in the Netherlands Panel Survey (GINPS) and the Netherlands Twin Register (NTR) waves to be collected. Previous waves of GINPS data collection have been funded by the Ministry of Justice, and it is likely that it will continue to sponsor the research. The amount requested here completes the funding likely to be secured from other sources for the collection of three waves of data, in 2012, 2014 and 2016. The NTR data are required to identify genetic and environmental origins of altruism. Sharing 100% of their genes, differences in altruism between monozygotic twins with different religious affiliation and levels of education show to what extent religion and education are ‘nurture’ influences. The twin data also enable identification of genes that contribute to differences in religion, education and altruism. The amount requested here covers the collection, cleaning and processing of two waves of data, in 2012 and 2016.

Literature references


