Risk and Rationality
Effects of contextual risk and cognitive dissonance on (sexual) incentives

Andréa Mannberg
Abstract

The thesis consists of an introductory part and four self-contained papers.

**Paper [I]** theoretically analyzes how the level and uncertainty of future prospects affect incentives to abstain from sexual risk taking in the presence of HIV. The results suggest that, for individuals with limited access to HIV treatment, uncertainty of future health may be an important factor driving unsafe sex practices and support the empirical finding of a weak link between sexual behavior, HIV prevalence, and HIV knowledge in poor countries; therefore suggesting that AIDS policy needs to be calibrated in order to fit within different social contexts.

**Paper [II]** empirically tests the hypothesis derived in paper [I] on young adults in Cape Town, South Africa. In order to adequately measure sexual risk taking we combine a wide range of variables measuring risky sexual behavior such that the maximum information possible is extracted from, and adequate weights are attached to, each measure. This approach differs from studies that commonly use individual measures or arbitrary aggregations. The findings indicate that expected income and health and future uncertainty are significant determinants of current patterns of sexual risk taking. However, the empirical results only provide limited support to a link between expected health and sexual risk taking.

**Paper [III]** theoretically analyzes effects of affect and defensive denial on incentives to engage in sexual risk taking related to HIV. The theoretical approach incorporates ideas from psychology on decision-making processes and risk evaluation, and ideas from economics on utility maximization. The results of the theoretical analysis suggest that the effect of rationalization of personal risk depends on the risk of being HIV positive. Although rationalization causes excessive risk taking behavior for individuals with a relatively low lifetime risk, it may prevent fatalism among individuals whose lifetime risk of HIV is perceived as overwhelming.

**Paper [IV]** theoretically analyzes the role of identity conflict for the evolution of female labor supply over time. The results suggest the fear of becoming an outsider in society may have prevented a complete transition of women from housewives to breadwinners. In addition, our analysis shows that not recognizing that the weights attached to different social identities are endogenous may imply that the long-run effects on labor supply of a higher wage may be underestimated.

**Keywords:** HIV/AIDS, Health risk, Uncertainty, Risk aversion, Self-Control, Time-inconsistency, Cognitive dissonance, Regret, Norms, Social identity.
Acknowledgments

My late grandfather always told me to do things the easy way instead of the hard, in terms of making sure that the proper knowledge was in place before aspiring to do some difficult task. Unlike him, however, who only got half deaf during old age (and then only heard what he wanted to hear), I’ve been half deaf most of my life. Consequently, I never paid much attention to his advice but rather continued to base my decisions on the strategy to plunge in and hope that I would keep my nose over the surface. Admittedly, leaping into unknown waters may not be such a daring strategy for an experienced swimmer. However, it may present an inexperienced one with some unpleasant surprises.

To be honest, my swimming skills were quite poor upon entering the cliffs of PhD-studies. As with my grandfather’s advice, I naturally ignored these facts. Instead I convinced myself that the force was strong in me and happily dove into the murky waters of writing this dissertation. Unsurprisingly, I’ve had a few involuntary gulps of cold water on the way. Indeed, there have been moments when I seriously thought that I would perish in the waves. Lucky for me, I’ve had a couple of wonderful people offering moral support, swimming advice and a life-west when things got tough. Needless to say, I would not have made it to the other side if it was not for them.

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Andréa
This thesis consists of an introductory part and four self-contained papers:


Introduction

How can we explain seemingly irrational engagement in sexual practices that expose individuals to the risk of an HIV infection? The main purpose of this thesis is to address this question. I first started thinking about sexual risk taking in terms of HIV/AIDS when I was writing my master's thesis on macroeconomic consequences of the HIV epidemic in Malawi in 2004. During my stay in the country, and upon doing the background research on the HIV/AIDS epidemic in sub-Saharan Africa, I became both devastated and intrigued. Devastated to see and learn about the magnitude of the epidemic and the consequences on the individual and household level, and intrigued because I could not quite understand why individuals with adequate HIV knowledge engage in sexual behavior that exposes them to the risk of an HIV infection. During the six years that have passed since my stay in Malawi, I have been trying to sort out the underlying mechanisms for sexual risk taking both in terms of what distinguishes the epidemic development in different countries, and in terms of what binds it together. The first three papers of this thesis constitute an attempt to disentangle these mechanisms.

The questions raised in the last paper of this thesis are not related to sexual behavior. Instead, paper [IV] addresses issues related to how social norms and personal behavior affect the development of personal preferences in the long run.

The rest of this introductory essay is outlined as follows: In section 1 a brief overview of the state of the HIV/AIDS epidemic and of sexual risk taking in the presence of HIV is given. Section 2 addresses the issues discussed in paper [I] and [II], and section 3 gives an introduction to the role of affect on sexual decision making. After these two sections a summary of paper [I], [II] and [III] is given. Finally, in section 4 the role of social norms and social identity for the evolution of personal norms is discussed. The section concludes with a summary of paper [IV].
1. HIV/AIDS and sexual risk taking

Since 1990, the global prevalence of HIV has increased more than threefold. According to UNAIDS (2009), 2.7 million new HIV infections occurred globally in 2008. In the same year, 2 million individuals died of AIDS related diseases, whilst an estimated 33.4 million were still living with HIV.

Poor regions in general and sub-Saharan Africa in particular continue to carry a disproportionately heavy burden in terms of HIV victims; in 2008, 67 percent of all HIV infections in the world were found in sub-Saharan Africa. During the same year, 68 percent of new adult infections, 91 percent of HIV infections in children, and 72 percent of all AIDS related deaths occurred in sub-Saharan Africa.\(^1\)

On the positive side, the development of antiretroviral (ARV) drugs and the combination of different ARV drugs into Highly Active Antiretroviral Treatment (HAART) have substantially increased the life length of HIV-positive individuals.\(^2\) In addition, access to ARV treatment in low and middle income countries increased ten-fold between 2003 and 2008. Similarly, reports on HIV knowledge are encouraging. For example, surveys in Burundi, Kenya, Zambia and Tanzania suggest a nearly universal awareness of HIV.\(^3\) However, although ARV coverage rates and HIV related knowledge have improved, a large share of HIV positive individuals in poor countries does not have access to HIV treatment.\(^4\) In addition, myths and misinformation\(^5\) about HIV still prevail.\(^6\) It should also be

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\(^1\) UNAIDS (2009).

\(^2\) For rich countries, reduced mortality has been documented on the population level. However, in poor countries results are only available from small sample studies: In Malawi, access to ARV reduced AIDS related mortality by 35 percent during the first 8 months of the intervention (Jahn et al., 2008). Likewise, in Kwa-Zulu Natal, the introduction of ARVs reduced AIDS related mortality among women by 22 percent and among men by 29 percent (Herbst et al., 2009).

\(^3\) UNAIDS, (2009); Caldwell, (1999); see also, e.g. Varga, (2001), Williams et al., (2003).

\(^4\) The percentage of pregnant women receiving antiretroviral treatment has improved substantially over that past couple of years. In many countries with reports of coverage rates, numbers are as high as 80 percent. However, although the trend in antiretroviral treatment distribution in poor countries has been positive, the number of new HIV infections each year outnumbers the increase in individuals on ARVs, by 2.5 to 1; See e.g. UNAIDS (2008); Rao et al. (2006).

\(^5\) See e.g. the misconception that HIV is transmitted via mosquito bites, that condoms can carry the virus and that having sex with virgins can cure the disease.

\(^6\) See e.g. UNAIDS (2009); Campbell (1997); Tillotson & Maharaj (2001).
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noted that, although important breakthroughs have been achieved, there is to date no cure for HIV and although HIV testing in sub-Saharan Africa has increased substantially, a majority of the population remain undiagnosed. For example, although HIV testing more than doubled in Kenya between 2003 and 2007, 83 percent of Kenyans living with HIV do not know their sero-status.7

In sub-Saharan Africa, the main mode of transmission of HIV is heterosexual sex. Now, heterosexual sex is a relatively inefficient mode of transmission of HIV.8 However, sub-Saharan Africa may be particularly vulnerable to HIV for several reasons: First, the relatively high prevalence of untreated Sexually Transmitted Infections (STIs) and traditions such as dry sex9 makes the transmission rate of HIV during vaginal intercourse substantially higher in sub-Saharan Africa than elsewhere.10 Second, the social acceptance of simultaneous sex partners in combination with a low degree of condom use increases the risk of an HIV transmission.11 For example, in Lesotho, 24 percent of adults have simultaneous sex partners, and in Uganda the percentage of men reporting having multiple sex partners rose from 24 percent in 2001 to 29 percent in 2005.12

Although interventions have resulted in improvements in HIV knowledge, increased condom use and reduced number of sexual partners, the lack of

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7 UNAIDS, (2009)
8 The risk of an HIV infection via unprotected vaginal sex has been estimated to 0.0001, see e.g., Gray et al., (2001).
9 Dry sex is a method for tightening the female genitalia by the use of herbs or synthetics. Since dry mucous membrane are vulnerable to cuts and sores, the tradition increases the risk of HIV transmission.
10 See e.g. Oster (2005); Campbell (1997); Buvé et al. (2001); Morison et al. (2001); Wojcicki and Malala (2001).
11 The reason for why having multiple sex partners is associated with such a high risk stems from a change in virus activity during the incubation of AIDS. As HIV enters the body, the virus is very active in terms of multiplying itself. This makes the individual highly contagious. However, as the virus attacks the body, the immune system tries to fight back. Although the human immune system is unable to completely eliminate HIV, it does bring down the viral load, and thus the degree of contagiousness. However, since HIV specifically attacks the immune system viral loads will eventually begin to soar again, thus making the individual once again highly contagious. For individuals with simultaneous sex partners, this implies that if one individual contracts HIV the likelihood of transmitting the disease is much higher than in cultures where individual have sequential sex partners, see e.g., Piasani (2008).
12 For example, in Lesotho, 24 percent of adults have multiple sex partners, and in Uganda the percentage of men reporting having multiple sex partners rose from 24 percent in 2001 to 29 percent in 2005 (UNAIDS, 2009).
behavioral change in high risk groups effectively means that there are very few signs of a significant reduction in HIV prevalence in sub-Saharan Africa. Indeed, in spite of the risk of an HIV infection, the price of unprotected sex has been found to be substantially higher than that of safe sex in areas where HIV prevalence rates among commercial sex workers (CSW’s) can reach 70 percent, and in Burundi, only 1 in 5 people report using condoms during commercial sex. Perhaps most puzzling is the high degree of sexual risk taking in groups where HIV knowledge is not necessarily inadequate.

According to economic theory, individuals form decisions by equating marginal costs to marginal benefits of given alternatives. Applied on sexual behavior, an economist would thus expect an individual to use all information available to him/her with regards to marginal costs and benefits of unprotected casual sex and choose the amount of ‘risky sex’ that maximizes utility. Using this approach, an increase in HIV prevalence should intuitively increase the marginal cost of unsafe sex and thus increase incentives to abstain from risky activities. This implies that, as HIV prevalence and HIV knowledge levels increase, we would expect to see a change in behavior towards safer sex practices and thus to a reduction in the spread of HIV. In many countries, this description fit the data

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13 Lagarde et al., (2001) estimate condom coverage at 27-31 percent for men and 11-17 percent for women in a number of highly affected cities in sub-Saharan Africa. In Zambia, the share of unprotected sexual acts with non-cohabiting partners actually increased during the late 1990s. See also UNAIDS, (2009); Caldwell, (1999, 2000); Bloom et al. (2000); Hearst & Chen (2004); Mwaluko et al. (2003).

14 Robinson & Yeh (2008) estimate the compensating differential for condom-free sex to 7.8% for CSWs in Busia District in Kenya, while Rao et al. (2003) find a 66% price differential for CSWs in Calcutta. Sociological case studies have reported prices for unprotected sex that are up to four times those for sex with condoms; see e.g. Abdool-Karim, et al. (1995); Pettifor et al. (2000); Morison et al. (2001). See also, e.g. Campbell (1997); Williams et al. (2003); Caldwell (1999); Varga (2001).

15 UNAIDS (2009).

16 Studies on South African miners (one of the most AIDS susceptible groups) suggest that risky sex prevails in spite of free access to condoms and a sufficient knowledge about HIV (Campbell, 1997).

17 It should also be noted that ARV treatment have been suggested as a potential explanation to persistent sexual risk taking and high HIV prevalence rates. The intuition behind this argument is that, since ARV treatment increases the life length of HIV positive individuals, the opportunities to infect other individuals also increase. In addition, since ARV reduces viral load, it reduces the risk of contracting the virus from a HIV positive individual and the potential cost of an infection. Hence, the availability of ARV treatment may actually spur sexual risk taking behavior and thereby increase HIV incidence. Indeed, a number of empirical results suggest that this is the case, at least in the United States (Lakdawalla et al., 2006; Mechoulan, 2007; UNAIDS, 2009).
relatively well. However, the simple cost-benefit approach to sexual behavior can neither explain why HIV intervention has been relatively successful within some groups, such as the gay community in industrialized countries (at least until recently), but not in others, nor why increased levels of HIV awareness has not been accompanied by larger reductions in sexual risk taking.

2. Expectations of future prospects and sexual risk taking

“Interviewer: Why is it that men think about pleasure first before thinking about their health?
Informant: The dangers and risks of the job we are doing are such that no one can afford to be motivated with life - so the only thing that motivates us is pleasure” (Interview with a South African mineworker, Campbell, 1997, p. 277)

During my stay in Malawi 2004, I became painfully aware of how the high degree of uncertainty of the future affected both individuals’ ability and incentives to plan for the future. I especially remember a young carpenter who, after having a good day, went out and used all his hard earned money for alcohol. When I asked him why he didn’t use the money to invest in better tools he simply replied: “Why should I? I may get robbed or hit by a car tomorrow”. After my stay in Malawi, I started to think that perhaps the same reasoning could be applied on sexual behavior.

Paper [I] and [II] address issues related to how uncertainty of the future affects incentives to abstain from sexual risk taking. In these papers, I argue that persistent sexual risk taking may reflect a rational decision process if future health is uncertain. The relatively long incubation time of AIDS implies that while the benefits of unsafe sex occur in the present, the cost does not occur until in a

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18 e.g. Philipson & Posner (1993; 1995); Schroeder & Rojas (2002).
19 For example mine workers, refugees, soldiers and migrant workers
20 See e.g., Caldwell (1999).
21 9-11 years without treatment; see e.g. UNAIDS (2008).
distant future. In addition, although the benefit is almost certain, the cost is most uncertain: not all sex partners are HIV positive and even if they are, the probability of an HIV infection is still just a probability. Similarly, since the future is always to some extent uncertain, the potential benefit of abstaining from pleasurable, but risky, activities is also uncertain.

For risk averse individuals, the more uncertain the future is the lower will the expected utility of experiencing that future be. Indeed, the tangible presence of risk and uncertainty of future prospects is a common feature among many HIV susceptible populations. For example, miners in sub-Saharan Africa face daily threats of mutilation or death in work related accidents. Similarly, WHO & UNAIDS (2002) reports that HIV prevalence soars in times of civic unrest: In Sierra Leone, estimated HIV prevalence surmounted to 60-70 percent among soldiers in 2002 and HIV frequencies among prostitutes increased from 26.7 percent to 70.6 during the civil war.22

The analysis of investment decisions under uncertainty of the future has a relatively long history in economics. Prominent examples include North’s (1990) theory of institutions, which suggests that uncertainty of the future may have detrimental effects on investments in human and physical capital and thus hamper economic growth. Similarly, Brock et al., (1982) argue that uncertainty about prices on foreign markets makes firms prone to focus on the domestic market even if the expected profit from selling abroad is higher, and Johansson & Löfgren (1985) and Koskela (1989) suggest that uncertainty of future prices increases incentives to harvest forest earlier than would be optimal without uncertainty. Applied on health related behavior, Dow et al., (1999) show that immunization programs, by reducing pressing mortality risks, increase incentives to invest in health. Similarly, but not explicitly focused on uncertainty, Oster (2007) shows that life expectancy is inversely correlated with number of sex partners.

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22 UNAIDS & WHO (2002), see also e.g., Benz (2005).
The argument put forward in paper [I] and paper [II] is that, for individuals living in areas where the risk of dying of something else than HIV is relatively high, the return to investments in health, such as abstaining from unsafe sex, is uncertain. Consequently, the presence of uncertainty of future health may make it rational for risk averse individuals to act shortsightedly.

Admittedly, it may be argued that the indulgence in sexual risk taking behavior is a consequence of hyperbolic discounting. However, hyperbolic discounting is likely to exist in all cultures and there is little evidence that HIV susceptible groups have more hyperbolic utility functions than others. Hence, although the existence of present bias preferences is probably a part of the problem, the first and second paper in this thesis does not focus on this aspect of sexual risk taking. Instead, paper [I] and [II] focus on the mechanism that differentiates the situation in countries with a soaring HIV epidemic from the situation in countries where HIV prevalence have remained at low levels: expectations of future prospects.

2.1 Measuring sexual risk taking

The second paper in this thesis empirically assesses the link between expectations of future prospects and sexual risk taking among young adults in Cape Town, South Africa. In addition to the focus on uncertainty of future health, the empirical approach in paper [II] differs from previous research with regards to two aspects: 1) instead of using a single indicator we use a combined measure of sexual risk taking and, 2) instead of focusing on sexually active individuals we control for the potential selection mechanism underlying the decision to enter the sexual market.

23 See e.g. O’Donoghue & Rabin (2000).
24 The Cape Area Panel Study (CAPS) Waves 1-2-3 were collected between 2002 and 2005 by the University of Cape Town and the University of Michigan, with funding provided by the US National Institute for Child Health and Human Development and the Andrew W. Mellon Foundation. Wave 4 was collected in 2006 by the University of Cape Town, University of Michigan and Princeton University. Major funding for Wave 4 was provided by the National Institute on Aging through a grant to Princeton University, in addition to funding provided by NICHD through the University of Michigan.
In previous research, sexual risk taking has commonly been measured with a single variable, such as age of first sex, condom use or number of sex partners. In paper [II], we argue that these variables in isolation may not give an adequate measure of sexual risk taking. Although condoms may admittedly fall off or break during sexual intercourse, it is not clear that individuals with relatively many sex partners that use condoms consistently engage in more risk than individuals with relatively few sex partners with whom condoms are used inconsistently. However, focusing only on sexual activity implies that we would make this assumption. Similarly, focusing only on condom use may give a distorted picture of sexual risk taking if the type of relationship is not considered. Finally, although having sex at a young age may imply that the individual will have relatively more sex partners in life than an individual that abstains from sex until older age, it may also reflect a culture where the social custom is to get married (and stay married) at a young age.

Hence, one of the main challenges for testing the hypothesis derived in paper [I] was to construct an adequate measure of sexual risk taking. This challenge was made more difficult due to the lack of previous theoretical and empirical research on the issue. The approach taken in paper [II] draws on a series of psychological studies by van der Velde & van der Pligt (1991), van der Velde et al., (1994) and van der Velde et al., (2002). In these studies, information concerning condom use, number of sexual partners and type of partner is combined in order to measure sexual risk taking among high risk individuals in Amsterdam. The approach taken in paper [II] constitutes an effort to extend the measure used in these studies, by empirically estimating the weights on each sexual risk indicator. This

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25 See e.g. Dinkelman et al. (2007); Oster (2007).
26 The measure used in these studies was achieved by multiplying the type (i.e. private or prostitution partner) and number of sexual partners with the degree of condom use (past 4 months preceding the interview). In addition, information related to the frequency of vaginal intercourse with each partner was included in the measure. The measure of condom use and frequency of vaginal intercourse was measured on ordinal scale (from never to always). The measure was constructed by transforming the Likert scales into multipliers. For example: A participant who had 5 private partners with whom the participant often had vaginal intercourse and with whom condoms were never used, and 5 prostitution partners with whom the participant always had vaginal intercourse while used condoms half of the time received the risk score: (5*0.75*1)+(5*1*0.5).
was achieved by conducting a factor analysis for ordinal variables and estimating the latent factor scores for our hypothesized variable sexual risk taking in LISREL 8.80.27

The second challenge for assessing the effects of health related uncertainty concerns how to deal with individuals not yet sexually active. The decision to abstain from sex altogether may reflect a strategy to avoid an HIV infection. Hence, excluding sexually inactive individuals from the analysis may give biased results. Accordingly, in the empirical model in paper [II] we control for selection into the sexual market.

Although the results of the empirical analysis in paper [II] lend some support to the hypothesis derived in paper [I], some of the results are mystifying and several questions remain unanswered. For example, expected health, which we proxy by subjective life expectancy, should intuitively be closely related to sexual risk taking. According to the theoretical hypothesis derived in paper [I] a lower level of expected health reduces the expected value of abstaining from unprotected casual sex. In addition, there may also be a relationship going the other way around: A high degree of sexual risk taking should intuitively reduce the expected level of future health. However, our results show that life expectancy is a relatively poor predictor of our measure of sexual risk taking, and we cannot reject exogeneity of the variable. How can this be?

First, note that regardless of whether the future is uncertain or not, the marginal cost associated with HIV risk does not only depend on the per-coital risk of an HIV infection, it also depends on the probability of being HIV positive since, disregarding altruistic objectives, an HIV positive individual has little to lose from having unprotected sex.28 As was mentioned above, many individuals (especially in poor countries) remain untested for HIV. For these individuals, an increase in HIV prevalence thus implies two things: 1) that the per-coital risk of

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28 Admittedly, unprotected sex for an HIV positive individual is still risky since the individual may acquire another STI which in turns reduces the immune system’s ability to keep maintain the viral load at low levels. See, e.g., Piasani (2008).
an HIV infection is greater and, 2) that the risk of already being HIV positive is greater.\(^29\) This implies that, at sufficiently high perceived risk of HIV, individuals may deem the likelihood of already being infected with the virus to be sufficiently high to make abstaining from risky sex relatively meaningless.

Second, although bringing uncertainty into the picture perhaps provide some answers to differences in the spread of HIV between countries and groups of individuals it doesn’t fully explain why individuals all over the world engage in sexual risk taking although we know we shouldn’t. Uncertainty of the future cannot explain the fact that although most individuals overestimate the risk of an HIV infection of an unprotected sexual act with a HIV positive individual, they nonetheless tend to underestimate their personal risk of HIV.\(^30\) Could it be that individuals that engage in sexual risk taking also overestimate their life expectancy for the same reasons? In that case, what are those reasons?

Paper [III] attempts to provide some answers to these issues, in terms of modeling effects of sexual arousal on decision making capacity and how the desire to maintain psychological wellbeing may induce incentives to underestimate personal HIV risk.

3. Emotions and rationalization of past behavior

3.1 Visceral cues and time-inconsistent behavior

Emotions may have both beneficiary and detrimental effect on decision making capacity. According to Lowenstein & Lerner (2003), emotions of low and moderate levels of intensity play a largely advisory role in terms of informing the individual about his or her preferences. However, at higher levels of intensity, physical arousal may block a systematic evaluation of the situation and of the potential consequences of a given behavior. In addition, the immediate emotion experienced at the time of the decision also indirectly impact decision making by

\(^29\) Kremer (1996).

\(^30\) See e.g., Bauman & Siegel (1987); van der Velde & van der Pligt (1991); van der Pligt, et al. (1993); Van der Velde et al. (2002).
changing the decision maker’s expectations about the probability and desirability of potential outcomes of the decision. In general, happy moods have been shown to favor a decision making process based on heuristics, to create an optimistic bias of the probability of positive outcomes and induce an underestimation of the negativity of emotions experienced due to a negative outcome. Similarly, strong negative emotions such as fear have been shown to induce a reliance on heuristics.31

The decision to use condoms or not are usually taken at a state of heightened physical arousal. Consequently, if preferences in the heat of the moment differ from preferences in colder states, it may not be entirely possible for an individual to act in accordance with his or her optimal life plan. The question that we have to ask ourselves is thus whether individuals truly can assess the marginal costs and benefits related to unsafe sex. Since decisions related to sexual behavior are usually taken in a positive mood, we may expect the decision to use condoms or not to be based on rules of thumb rather than on a systematic evaluation of marginal costs and benefits and that the probability of an HIV infection may be underestimated. Similarly, if this behavior later on induces fear of an HIV infection (or any other type of STI), we may once again expect that the individual experiencing this emotion will engage in heuristic based decision making.

So how can we understand how rational individuals deal with the presence of strong emotions? According to Ainslie (1974; 1975; 2001) the human mind can be described as a set of different interests which differ with respect to the time-horizon for need-fulfillment. For example, consider an individual with the desire to have a well trained and healthy body. Actions that work towards satisfying this interest clearly have a long term pay-off. However, upon coming home from work the same individual may have the short term interest to dodge in front of the TV instead of heading out for a 10 km run. In other words, the individual experiences a conflict of interests. According to Ainslie, the outcome of the decision process depends on the relative bargaining power of each interest.

31 See e.g. Johnson & Tversky (1983); Griffin et al. (1999); Bodenhausen, et al. (1994); Forgas (1998); Tiedens & Linton (2001).
Bargaining power in turn, depends on the proximity of need-fulfillment, how benefits and costs are bundled, and on contextual cues.

According to Loewenstein (1996), states of heightened physical arousal make present benefits more salient and future costs less distinct, and may therefore give rise to time-inconsistent preferences. Indeed, Loewenstein goes as far as arguing that visceral factors, such as sexual arousal, hunger or fear, tend to ‘crowd out’ virtually all goals other than that of mitigating the visceral factor, and thus to hamper the long term interests’ ability to exert power. This hypothesis is supported by a number of empirical studies. For example, in a series of experiments, Ditto et al. (2006) found that respondents induced to experience sexual arousal or hunger were significantly more likely to act myopically (i.e. being more positive towards unprotected sex in a sexually aroused state and accepting a smaller immediate reward when exposed to the smell of chocolate chip cookies) than respondents not exposed to visceral cues. Similarly, Ariely and Loewenstein (2006) found that experimentally induced sexual arousal was associated with a higher degree of acceptance of norm-violating and risky behaviors that increased the likelihood of having sex.

Time-inconsistent behavior in terms of hyperbolic utility functions is today relatively standard procedure in economics. However, although the assumption of hyperbolic discounting has been well motivated by state-dependent utility or by modeling the individual as a sequence of temporal selves with different preferences, it was not until relatively recently that the analysis of the mechanisms underlying the excess weight on present utility was addressed in economic papers. Loewenstein (1996) and Loewenstein & O’Donoghue (2007), argue that the human brain can be modeled as consisting of two systems: an affective/short-sighted, and a cognitive/forward-looking system. Visceral cues, such as hunger or sexual arousal, activates the affective system of the brain and makes decisions...
consistent with long term goals more costly (i.e. resisting the temptation to eat sweets is more difficult when exposed to the lovely scent of a newly baked bun than when not exposed to the scent). If the cognitive cost of resisting the temptation is sufficiently high, the individual may thus indulge in behavior that is later regretted.34

3.2 Defensive denial and cognitive dissonance

“People think: we are not simple reinforcement machines. And, because we think, we frequently get ourselves into a tangled muddle of self-justification, denial, and distortion.” (Aronson, 1992, p. 304)

Although the presence of emotions may explain how time-inconsistent behavior occurs, much of the research conducted within the field of economics have not studied the consequences of inconsistent behavior on attitudes and preferences. In other words, very little economic research has focused on the question: what happens inside an individual upon realizing that long term goals (perhaps closely associated with the individual’s actual or ideal self-image) has been violated?

The aim of Cognitive dissonance theory35 is to answer this important question. The theory predicts that holding two cognitions that are psychologically inconsistent will give rise to a negative physiological arousal (cognitive dissonance). According to Festinger (1957), the arousal caused by the psychological inconsistency is sufficiently uncomfortable to motivate people to reduce the conflict by changing one of the cognitive elements so that they fit better together.36 Festinger’s original theory predicted that any two inconsistent cognitions would give rise to dissonance and thus to incentives to change either cognition. However, as shown by Aronson (1968), dissonance theory makes its strongest predictions when a person’s freely chosen behavior violates an important element of the self-concept. Accordingly, Aronson’s revised version of cognitive dissonance theory suggests

34 See also, e.g., Fudenberg & Levine (2006); Gul & Persendorfer (2001).
35 Festinger, (1957), Aronson, (1968; 1992)
36 Aronson, (1992)
that only cognitions that are inconsistent with the individual’s self-concept will give rise to aversive physical arousal.\(^{37}\) Aronson (1992) further suggests that most individuals strive for three things: 1) to preserve a consistent, stable, predictable sense of self, 2) to preserve a competent sense of self, and 3) to preserve a morally good sense of self. Hence, what makes an individual to perform a dissonance reducing behavior depends on whether the individual has performed something that a) surprises him, b) questions his intelligence, or c) makes him feel guilty.\(^{38}\) Aronson (1989) gives an illustrative example: Consider a smoker that receives information about the relationship between smoking and cancer. The information about cancer and smoking presents him/her with two inconsistent cognitions: a) information of the dangers of smoking, and b) the knowledge that he/she is engaging in this potentially lethal habit. In combination these two cognitions clearly questions the individual’s intelligence. The individual can handle this information in mainly two ways; 1) by a change of behavior (quit smoking), or 2) by discrediting the information given. In Aronson’s own words: “When a person reduces dissonance, he defends his ego, and keeps a positive self-image. But self-justification can reach startling extremes: people will ignore danger in order to avoid dissonance, even when that ignorance causes their death” (Aronson, 1989, p.135). Dissonance theory further suggests that although people tend to use all available information before making a decision, they tend to seek reassurance that they did the right thing after the decision has been made. In order to do so they either seek information that supports the rightness of their behavior, or try to rationalize their behavior by a benevolent interpretation of the information already in their heads.\(^{39}\)

Sexual risk taking behavior in areas where the risk of an HIV infection is significant clearly questions the individual’s perception of being an intelligent and competent person. In addition, given the risk of being HIV positive, continuing to have unprotected sex with potentially uninfected individuals questions the self-image of being morally good. Hence, if an individual engages in risky sex, due to

\(^{37}\) Thibodeau & Aronson, (1992)
\(^{38}\) Aronson, (1992)
\(^{39}\) Aronson (1989).
for example the reasons discussed in the previous section, we may expect that this individual will experience cognitive dissonance and thus have incentives to rationalize behavior in order to maintain a positive and consistent self-concept. This hypothesis is supported by a number of empirical studies: Gerrard, et al., (2000) asked adolescents to report risk behaviors and the extent to which concerns about health and safety would influence those behaviors in the future. The results showed that the more the adolescent reported concerns, the less likely they were to engage in risk behavior. However, once they initiated in risky behaviors they entered into a ‘denial-like’ process in terms of avoiding thinking about the danger associated with that behavior. According to Gerrard et al., (2000) the motivation behind the tendency to minimize the perception of risk and severity of the outcome is the justification that one is normal and rational. Similarly, Benthin et al., (1995) found that respondents who used condoms were more likely to associate positive concepts and positive outcomes with condoms, and less likely to associate negative concepts and negative outcomes.

The theoretical model presented in paper [III] attempts to incorporate ideas relating to the role of emotions concerning both decision making capacity and the tendency to rationalize behavior in order to maintain a positive and consistent self-image. The theoretical approach relates most closely to the work of Akerlof and Dickens (1982), who in accordance with the ideas of Aronson (1968; 1992) assume that individuals that accept being exposed to health risks will experience aversive arousal related to both fear and a questioning of their self-image as an intelligent person. In the setting of their theoretical model, rationalization is modeled as deliberately (but perhaps unconsciously) understating the risk taken.

Akerlof and Dickens model the exposure to risk as to a large extent exogenously given. Since the decision to use condoms in most circumstances is endogenous, the approach taken in Paper [III] differs from the Akerlof and Dickens (1982) approach in terms of the assumption related to the exogeneity of risk exposure. Instead, the approach taken to model the effect of sexual arousal is closely related to the work of Loewenstein & O’Donoghue (2007) and
O’Donoghue & Rabin (2000). However, whereas the Loewenstein & O’Donoghue (2007) and O’Donoghue & Rabin (2000) papers end with the analysis of how affect may give rise to excessive sexual risk taking, the model presented in paper [III] continues with an analysis of how affect induced myopia creates incentives to adjust long run preferences and behavior.

3.3 A final remark related to sexual risk taking

In the theoretical models presented in this thesis, individuals are assumed to remain ignorant about their HIV status. This is naturally a relatively stark assumption. However, as mentioned in section 1, a majority of individuals in HIV susceptible groups actually do remain undiagnosed. To some extent, the low level of HIV testing is explained by insufficient supply of affordable HIV tests. However, I also find it intuitive to apply the reasoning from the previous discussion on the decision to test for HIV. Since HIV is still not curable and effective treatment is not universally available, and since being HIV positive in many instances is associated with social stigma, resistance to HIV testing may not be that surprising. As stated by a 28 year old trucker in Varga (2001, p. 359): “I would never take an AIDS test voluntary… Such a decision would be premature and suicidal”. Similarly, a quote from an informant in a study on sex workers in Johannesburg show that fear prevent HIV testing: “No. I’ll do the HIV test when there is a cure for AIDS. I don’t want to make myself miserable.” (Wojcicki & Malala, 2001, p. 114).

Finally, it should be noted that one important aspect of sexual risk taking is missing in this thesis: It takes two to tango. All the way through this thesis, decisions are treated as made by a single individual. However, decisions related to sex are in general made by two individuals. Hence, even if one individual finds the direct benefits of condom use to outweigh the direct costs, it is not certain that his or her partner makes the same evaluation. This implies two things: 1) that the decision to use condoms or not may best be represented by a bargaining game where the outcome depends on the relative bargaining power of each player and, 2) that additional costs associated with condom use needs consideration.
If women lack sexual bargaining power, they may not be able to choose their individual optimal bundle unless their preferences are the same as their partners. Similarly, social norms may foster attitudes towards condoms that increases the social cost of safe sex practices. For example, studies in sociology suggest that condoms in many cultures are associated with lack of trust, lack of masculinity for men and promiscuity of women. Hence, the inclusion of social norms and sexual bargaining is important areas of future research. In addition, empirical investigations on the role of cognitive dissonance in sexual risk taking need further attention.

Summary of papers [I], [II], and [III]

Paper [I]: Risky Sex in a Risky World – Sexual risk taking in an HIV/AIDS Environment

In the first paper in this thesis, a theoretical model is developed in order to analyze how observations of seemingly irrational sexual behavior, such as unprotected casual sex in areas and populations with high HIV frequencies, fits with existing knowledge on human incentives under uncertainty of future health prospects. In addition, effects of improvements in expected health and income are analyzed. The results of the theoretical analysis suggest that, for individuals with no access to HIV treatment, uncertainty of future health reduces the expected benefits of health investments and the expected cost of health destructive behavior. Similarly, low levels of expected future health contribute to low levels of perceived costs regarding unsafe sex activities and may thereby reduce incentives to abstain from unsafe sex practices. These results support the empirical finding of a weak link between sexual behavior, HIV prevalence, and HIV knowledge in poor countries. In regions where access to ARV drugs is limited, interventions that improve general health and reduces uncertainty may thus constitute an important ingredient in an effective AIDS policy. The results

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40 See e.g. Campbell (1997); Campbell (2000); MacPhail & Campbell (2001).
also suggest that the recommendations for policy changes with the availability and quality of ARV drugs; the larger the share of the HIV positive population that is covered by HAART, the less beneficial will policy that focuses on reductions in uncertainty be for sexual risk taking. Hence, while it may be major importance to focus AIDS policy on social insurance etc. in poor countries, it may be of little interest (it may even be destructive) to focus AIDS policy on reducing uncertainty in rich countries. In addition, the more effective HIV treatment becomes, the more important it may become to invest resources in improving overall health in areas where access to drugs is limited. Thus, if a cure for HIV is found in the future and if we lack resources to distribute this cure to all, it may be of great value to intensify efforts on general health interventions such as immunization programs etc. Finally, as long as we cannot cure HIV, risk preferences among targeted individuals will affect the outcome of AIDS policy. More specifically, the more risk prone an individual is, the more likely it is that a policy aimed to improve general health will increase the incentives to abstain from unsafe sex consumption. Some of the most HIV susceptible populations can be suspected to be less risk averse than the average person (e.g. CSW’s, mine workers, military workers, and drug users). Hence, health focused interventions may be of great importance in these populations.

Paper [II]: Sexual Risk Taking among Young Adults in Cape Town – Effects of Expected Health and Income

The second paper in this thesis empirically analyzes the link between expectations of future prospects and sexual risk taking on a dataset consisting of young adults in Cape Town, South Africa. More specifically, the effects of uncertainty of future health, the expected level of future health and the expected level of future income on sexual risk taking are assessed. In order to adequately measure sexual risk taking we use factor analysis to combine a wide range of variables measuring risky sexual behavior such that the maximum information possible is extracted from, and adequate weights are attached to, each measure.
The estimated measure of sexual risk taking is then regressed on the set of explanatory variables using a Tobit model with selectivity. Since expectations of future health are possibly endogenous to the level sexual risk taking, we instrument this variable with mean life expectancy in the community in which the young adult resides.

The results of the empirical analysis suggest that uncertainty of future health is a significant determinant of current patterns of sexual risk taking. Similarly, risky sexual behavior tends to be associated with low current income. Hence, if current household income is a viable proxy for income expectations, this result suggests that an expectation of a prosperous future may reduce the incentives to engage in sexual risk taking in the present. Finally, the empirical analysis does not lend support for a relationship between expected life length and the combined measure of sexual risk taking. Since the reliability of the estimated sexual risk taking measure is relatively low, we also consider the degree of condom use with the young adult’s latest sexual partner as a proxy for sexual risk taking. Controlling for selectivity and for the type of relationship the young adult had with his or her latest sexual partner, this regression produces a significant effect of life length expectations on the degree of sexual risk taking in terms of condom use. However, the degree of variance explained in the regression is relatively low. Hence, the evidence for a link between subjective life expectancy and condom use is relatively weak. Since our test of exogeneity indicates that subjective life expectancy is not affected by the degree of sexual risk taking, we suggest that this weakness may be a result of optimistic bias. If the fear of HIV induces incentives to rationalize behavior, in terms of downplaying the risk associated with the young adult’s sexual behavior, then subjective life expectancy may not appear to be affected by the degree of sexual risk taken. In addition, if the measure of life expectancy is biased due to rationalization tendencies, we perhaps should not be surprised to only find a weak link between the two measures.

The results for the covariates suggest that females are exposed to HIV risk to a higher degree than men. Even though women are less likely to be sexually
active, they are also less likely to use condoms frequently. This result points to the social taboos related to women’s use of condoms and to women’s general lack of sexual bargaining power. We also find a significant relationship between HIV knowledge and the degree of sexual risk taking. However, although previous research has found that knowing someone with HIV reduces the degree of sexual risk taking, our analysis suggests that a personal experience of HIV actually increases the degree of sexual risk taking.

Paper [III]: Risk and Rationalization – The Role of Affect and Cognitive Dissonance for Sexual Risk Taking

In the third paper of this thesis, a theoretical model is developed in order to analyze how affect and defensive denial affect incentives to engage in sexual risk taking with respect to an HIV infection. The theoretical approach incorporates ideas from psychology on decision-making processes and risk evaluation, and ideas from economics on utility maximization. In the model, an individual is assumed to live during three time periods. In each time period, the individual is exposed to sexual temptations with potentially HIV infected partners. During these occasions the individual can choose whether or not to use a condom.

However, although the individual in cold states is assumed to be able to correctly estimate the risk associated with unprotected sex, a sexually aroused individual is assumed to suffer from myopia in terms of being unable to correctly assess the correct risk and the experienced utility of a negative outcome (i.e. acquiring HIV). Accordingly, I assume that the individual consist of a sequence of different selves (or interests) whose individual objective functions may differ in the evaluation of long term costs. At the onset of each time period, a rational long term self is assumed to use all available information to him at that point in time to maximize lifetime utility. However, this long term self is not in actual charge of future sexual decisions. Instead, sexual arousal is assumed to transfer the executive power to a more short-sighted self. Since sexual risk taking in the presence of HIV questions the individual’s self-image as an intelligent person and
induces fear of an HIV infection, an individual that has given in to the temptation to have unprotected sex is assumed to experience incentives to downplay the risk taken. This rationalization is assumed to not only relieve immediate stress but also to distort the information set of future selves.

The results of the theoretical analysis suggest that sexual risk taking may, in addition to increasing the risk of an HIV infection directly, increase the inclination to engage in unsafe sex practices in the future and that the mechanism behind this behavior is two-fold: First, sexual risk taking during young age increases the likelihood of being infected with HIV and thus reduces the perceived marginal benefit of abstaining from unsafe sex during later periods in life. Second, if affect induced risk taking is associated with defensive denial in terms of rationalizing, the underestimation of personal per-coital risk of HIV may lead to an underestimation of the marginal cost of unprotected sex later in life and therefore to excessive risk taking behavior. However, the defense mechanism to rationalize may not be destructive in all circumstances. Since denial of risk also reduces the perceived probability of being infected with HIV it may create incentives to use protection for individuals who would otherwise resort to fatalism and reckless behavior. The results further suggest that anticipating the regret associated with sexual risk taking increases incentives to engage in precautionary behavior.

4. Conflicting Identities and Social Pressure

As was mentioned in the introduction, the final paper in this thesis is not related to sexual risk taking. Nonetheless, the approach taken in paper [IV] is related to paper [III] in that it focuses on how behavior that questions our self-image affects incentives to both change our behavior and to update our self-image. Paper [IV] thus continues the analysis of cognitive dissonance. However, in this paper we utilize cognitive dissonance theory in order to analyze changes in gender roles and the evolution of female labor supply over time. To do this, we
draw on psychological theories on the role of social norms and conflicting social identities for changes in preferences over time.

4.2 Social norms and identity

According to Rimal and Real (2003, p. 185), a social norm in its most general sense is a “...code of conduct that either prescribe or proscribe behaviors that members of a group can enact.” In order for it to be a norm, a violation must trigger a sanction of some form, and in order for it to be a social norm it must be understood through social interaction. In other words, social norms impose non-pecuniary costs for norm-violating behavior and may therefore create incentives to conform to social expectations. However, social norms in isolation cannot explain why people conform when there is no surveillance or why they engage in sanctions of norm-violating behavior that, at least at first glance, does not affect them personally.\footnote{An example given in Elster (1989) is the presence of vengeance norms. The threat of vengeance is only credible if it is believed that the individual will follow through regardless if the expected benefit is positive or negative.}

In order to understand these phenomena, it is fruitful to consider the role that personal norms and identity plays for an individual’s well-being.

Personal norms may be defined as internalized rules prescribing certain values, beliefs and behaviors that are consistent with an individual’s desired self-image or identity. While social norms are maintained by external sanctions or rewards, compliance with personal norms is enforced by the fear of negative (guilt, shame, reduced self-esteem) or wish for positive (pride, enhanced self-esteem) self-evaluations.\footnote{Kerr et al. (1997); Swartz (1977); Steele (1988); Bamberg et al., (2007).} A violation of a personal norm questions the credibility of the individual’s identity and, in accordance with the discussion in section 3.2 therefore threatens to cause aversive arousal.

Although social and personal norms may differ, they are nonetheless closely interlinked. This is so since the more an individual identifies with a certain social group the more likely it is that part of the individual’s personal identity will be
related to that of other group members in terms of a social identity. To see this, consider an individual who aspires to become an accepted member of a given social group. When this individual interacts with the other members of that group, she becomes exposed to the prevailing social rules. Naturally, although she identifies with the group, she may not agree completely with all of these prescriptions. However, in order to avoid sanctions and to ‘fit in’ she may nonetheless feel compelled to adjust her behavior to that of the social expectations. If the social rules are inconsistent with her personal norms, this conformity may give rise to dissonance related arousal and therefore create incentives to either leave the group (stop identifying with the group members) or to convince herself that her values and beliefs are the same as those prevailing in the group. Due to this adjustment, individuals that categorize themselves as a member of a certain social group, also tend to ascribe prototypical attitudes in the group as their own.

The close relationship between our self-image and our social identity implies that the behavior of other group members affects our self-image. If these individuals conform with/deviate from the socially prescribed behavior, this behavior confirms/questions our identity and therefore has the potential to give rise to positive/negative arousal. Consequently, behavior that at first glance does not affect an individual may nonetheless present him or her with incentives to engage in positive or negative social sanctions via the effect on his/her identity.

Now, if all individuals only had one social identity we might expect personal norms to be relatively stable over time: We would simply affiliate with one social group, adjust our values and behavior and live ‘happily ever after’. However, most of us are not that one-dimensional. Instead, psychological theories of personality suggest that, although most individuals perceive themselves to have a coherent overall personal identity, they nonetheless define themselves in terms of a set of

43 Social identity is defined as the individual’s knowledge that he or she belongs to certain social groups, together with some emotional or value significance for him or her attached to the membership in the group (Tajfel, 1982).
44 Cooper & Hogg (2002).
45 Tajfel (1974); Hogg (2000); Abrams & Hogg (1990), Cooper & Hogg (2002).
identities related to the different social groups to which they ascribe membership. For example, if you would ask a certain female researcher in economics to describe who she is, she would probably respond in terms of a set of identities related to her gender, her nationality, her profession, her religious, political and cultural affiliation and perhaps in terms of her hobbies. Although these identities together constitute the building blocks of her overall personality, there is no guarantee that these different identities prescribe compatible values and behavior, thus leaving the door open for cognitive dissonance. In line with this argument Roeske and Lake (1977), in a study of identity conflict, found that female medical students defined themselves in terms of different social identities such as being a ‘physician’, a ‘woman’, etc. For many of the respondents, these social identities coexisted relatively peacefully. However, Roeske and Lake found that, upon reaching the age when children becomes incorporated in the social identity of being a woman, the respondents experienced negative emotions related to the conflict between the incentives to be a (good) mother, and incentives to have a career as a physician. Hence, in accordance with cognitive dissonance theory, these women experienced a motivation to either change their interpretation of the norms associated with each social identity or to change the relative weight of the social identities in their overall personal self-concept.

4.2 The role of identity for the evolution of female labor supply

During the last century, the roles of men and women have changed dramatically in most industrialized countries. For example, since the end of World War II, the female labor force participation (LFP) in the US has increased from 30 percent to over 70 percent. As can be seen in Figure 1, the same trend can be found in many other countries and in Iceland and Sweden female LFP rates today reaches 80 percent and higher.48
However, as is also depicted in the figure, large differences in female LFP persist between countries and there is to date no OECD country where women participate on the labor market to the same extent as men.

Possible explanations for the increase in female LFP are higher female wages, lower fertility rates and higher educational attainment among women. However, these factors have only been partially successful in explaining the evolution of female employment rates. Instead, it has been suggested that changes in social norms are important for understanding these developments.

The role of social norms for human behavior has a relatively long history in economics. However, as mentioned above, social norms in isolation provides us with insufficient information to explain changes in behavior and preferences over time.

In the model presented in paper [IV] we argue that social norms, in combination with the presence of conflicting identities and individuals’ need to maintain a

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49 UN gender info 2007
50 See, for e.g., Killingsworth & Heckman (1986), and Goldin (1990).
52 See Golding (1990, 1994), Romme (1990), and van der Lippe and Siegers (1994).
53 See e.g., Akerlof (1980); Bernheim (1994); Lindbeck (1995, 1997) and Lindbeck et al. (1999).
consistent self-image, may have important implications for individual behavior and for the evolution of preferences over time. More specifically, we argue that we, in order to fully understand the mechanisms underlying both the increase in female labor force participation and the persistence of part-time labor among women, need to incorporate identity conflict and social norms in the analysis. The theoretical approach taken in the paper relates to the economic literature of social sanctions, internalized personal norms and social identity. It is most closely related to the work of Akerlof & Kranton (2002) and Vendrik (2003).

Akerlof & Kranton (2002) show that if social group membership provides individuals with utility in terms of a social identity, deviant behavior that questions this identity will cause utility loss and therefore contribute to conformity even in the absence of external sanctions. Our approach differs from the Akerlof & Kranton (2002) model mainly in that we model how individual behavior may change the relative importance of different social identities and how this in turn affects female labor supply, whereas Akerlof & Kranton focus on the importance of a single (and static) identity for school performance.

Vendrik (2003) develops a theoretical model in order to analyze the evolution of female labor supply. According to Vendrik, the social identity of many women was previously to a large extent related to being a housewife. For these women, a ‘successful’ life was intimately associated with how well they lived up to the prescribed behavior of a ‘good’ housemother, and full-time market work may therefore not have been an option due to both social sanctions and to guilt of not taking properly care of the home. According to Vendrik, the increase in the demand for (and wage of) female labor during World War II provided women with incentives to act in discordance with the prescribed behavior of housewives and this norm-violating behavior in turn created incentives to erode the belief in the traditional household norm.

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54 See e.g., Akerlof (1980); Bernheim (1994); Lindbeck (1997); Lindbeck et al., (1999).
Although the Vendrik (2003) model provides interesting insights on the mechanisms underlying the female transition from housewives to breadwinners, we argue that his model can be augmented in several aspects. First, Vendrik’s analysis suggests a complete erosion of norms prescribing that women should take care of the family. However, in most countries women work part-time to a higher extent, and have a larger responsibility for household work, than men. In addition, great differences in both female LFP and gender norms persist between countries.57

Second, Vendrik assumes that women only have one social identity and therefore only derive utility from work in terms of consumption. However, from our discussion above, we know that most individuals derive utility from several identities. Hence, we may expect working women to have (or form) a professional identity as well as an identity related to their role within the household. In contrast to Vendrik (2003), we therefore assume that it is not only the conflict between one personal and social norm that drive the evolution of behavior over time, but rather that conflict between different identities. In accordance with the psychological literature referred to above, our main idea is that an individual’s overall self-concept is constituted by a set of different identities, where the weight attached to each identity (i.e., the relative importance of that aspect for the individual’s overall self-image) may differ both between individuals and within an individual over time. The argument put forward in paper [IV] is that changes in wages and social norms related to female market work may have induced changes in behavior that, via cognitive dissonance, changed the relative weight on women’s social identities as housewives and increased the relative importance of their identities as career women. The inclusion of different identities and the separation between personal and social norms in the model enables us to identify steady states where women do not make the full transition and therefore continue to work part-time. In addition, we show that in countries or social groups where the prevailing social norms prescribe traditional values, women with professional

57 OECD labor market statistics, UN Gender info 2007, and ISSP 2002
ambitions may resort to changing their identity towards being more ‘traditional’ in order to better fit into society.

Summary of paper [IV]:

Paper [IV]: Conflicting Identities and Social Pressure – Effects on the long-run evolution of female labor supply

In the fourth paper of this thesis, we utilize ideas developed by psychologists concerning peoples need to both fit into social groups and to maintain a positive and consistent self-image to analyze changes over time and between countries in female labor market participation. More specifically, we argue that part of the explanation to the change in both social norms and personal preferences for market work amongst women can be found by an analysis of conflicting social identities. We make the simplifying assumption that women mainly define themselves in terms two identities, one related to their role within the household (i.e., being a ‘good’ wife/mother) and another related to their work (i.e., their professional identity), each of which is associated with both personal and social prescriptions concerning behavior that may vary over time and between different societies. We further assume that behavior consistent with the prescriptions of a valued identity confirms that identity and therefore results in a boost in self-esteem. In contrast, a violation of a personal norm creates feelings of guilt and low self-esteem. Finally, we assume that the individual’s personal norms related to a given identity need not coincide with the social prescriptions related to that identity. Hence, if the individual values the membership of a given social group, she may feel compelled to act in discordance with her personal norms in order to satisfy social expectations. This violation of her personal norms is assumed to give rise to cognitive dissonance and thus to incentives to revise the relative importance of fulfilling that personal norm. In addition, since the individual is assumed to have two conflicting identities, an individual may experience cognitive dissonance even if personal and social norms coincide.
Applying this approach within the context of a dynamic model of labor supply, we are able to make some novel predictions about what may cause labor supply to change over time. For example, we show that the effect of a change towards more positive social attitudes to female labor market participation may become enforced in long-run due to the induced change in the self-image of women. Similarly, we show that not recognizing that the weights attached to different social identities are endogenous may imply that the long-run effects on labor supply of a higher wage is underestimated. Finally, our results suggest that women living in societies characterized by traditional gender norms with 'high ambitions', in terms of having strong personal preferences for market work, may find it optimal to adjust their self-image to the social representation of women.

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