The Treadmill of Declining Farm-Business

On the Relationship Between Farmers' Finances and Well-Being

De Negatieve Spiraal van Geld en Gemoed

Over de Relatie tussen de Financiën en het Welbevinden van Agrarisch Ondernemers

(Met een samenvatting in het Nederlands)

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CHAPTER 1

INTRODUCTION

In the second half of the 20th century, agriculture has faced profound environmental changes. The current thesis will address the question how changing prospects for the farm business affect the well-being of Dutch farmers and their wives. To put our research into perspective, we will first describe some of the most important developments in European agriculture at the end of the 20th century.

Structural Changes in European Agriculture at the end of the 20th Century

Since the Second World War, agriculture in Europe has been characterized by large structural changes. First, agricultural production started expanding in response to food shortages. The European Union (EU), which was founded in 1957, stimulated this expansion by subsidizing investments, and providing price support and export restitutions to correct for low prices of agricultural products (Bauwens & De Groot, 1990). Particularly medium sized farms benefited and expanded at the expense of their smaller neighbors (Gasson & Errington, 1993). Consequently, in the six countries then participating in the EU[1], between 1960 and 1980 the number of classified farms (larger than 1 ha.) dropped with almost 40%, from 6,818,000 (Ministerie van Landbouw en Visserij, 1963) to 4,326,000 (Ministerie van Landbouw en Visserij, 1983). Simultaneously, the average farm size increased (Vidal, 2000), as small farms gave way to larger farms and larger farms invested in technical innovations and growth. For instance, in the six founding countries of the EU, between 1967 and 1997, average farm size increased from 10 to 19 ha.

[1] Belgium, Luxemburg, The Netherlands, France, Germany and Italy

However, in the 1980s, the drawbacks of EU politics became evident. Protected by market and price policies, surpluses of agricultural products arose, because of which prices of other agricultural products fell and farm incomes declined (Landbouw Economisch Instituut, 2000). Farmers increasingly got caught in what was called the "treadmill of technology" (Gasson & Errington, 1993). Early adopters of new technologies had benefited from temporary gains related to decreased production costs and increased output, but the average farmer now needed to innovate merely to survive. Those who continued to produce at the old, higher level of production costs were eventually forced out of business. Farmers could generally not finance expansion and innovation with their own capital, and they increasingly started to work with borrowed capital. In turn, this led to striving for higher profit margins in order to pay interests and redemptions.

The EU started to take measures to control overproduction, such as the introduction of milk quota, which curtailed the volume of milk produced, but maintained the milk price. After 1992, launched by the MacSharry reforms[2] and the GATT agreement[3], governmental support gradually shifted from price support towards income support. Partly because of these changing EU policies, overproduction decreased and prices in agricultural products increased.

The last decennium of the 20th century, the farming community in the EU faced a gradually declining economic importance of their sector, which translated, for instance, into a lower contribution to the gross domestic product (GDP) and lower employment in the sector (Gordon, 2000; Landbouw Economisch Instituut, 2000). This led to further restructuring of agriculture

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[2] Reforms introduced by the EU commissioner of Agriculture McSharry in 1991, primarily aimed at driving back overproduction in agriculture

[3] The General Agreement of Tariffs and Trade (GATT) is a set of basic rules and regulations for a multilateral global trading system, which are the result of multilateral negotiations of the World Trade Organization (WTO), a global international organization dealing with international rules of trade.

and horticulture. Meanwhile, the decline in number of farms continued. Between 1990 and 1997, the number of classified holdings in the EU, now consisting of 15 countries, decreased with 19% from 8582.900 to 6954.300 (Gordon, 2000). On the other hand, the average farm size kept increasing. Between 1990 and 1997, in the EU it grew from 13.3 ha to 18.4 ha. Additionally, the production process intensified, leading to a constant increase in production volume. A positive aspect of these developments was that the average incomes the EU derived from farming have shown an upward trend between 1990 and 1996 (Gordon, 2000). Only recently have farm incomes started to decline somewhat again (Landbouw Economisch Instituut, 2000).

Farming in The Netherlands

Agriculture in The Netherlands followed the European trends mentioned above to a large extent. Particularly in the early years of the EU, Dutch farmers innovated on a large scale, greatly profiting from the EU measures. However, although incomes in Dutch agriculture were still high in the 1990s, since 1992 the income developments have lagged behind the developments in the rest of the EU (Landbouw Economisch Instituut, 2000). The main reasons are that, first, whereas employment had *de*creased in other EU countries, the employment rate in Dutch agriculture had not changed. Second, two important branches had faced unfavorable financial results, namely horticulture under glass and pig and poultry farming.

Together with structural changes and the declining economic importance of agriculture, the public opinion on farming changed as well. Consumers became increasingly demanding concerning both the quality of agricultural products and the production process (Landbouw Economisch Instituut, 2000). This was not only communicated to farmers through the media, but societal demands also translated into regulations affecting farmers' daily work. For example, in 1998, the use of pesticides and herbicides was

restrained and many means for plant protection were forbidden in order to protect nature. This resulted in increased outbreaks of diseases in crops, thus increasing production costs (Janssens, Van der Meer & Thews, 2002). Additionally, public support for financial aid to allow farmers to continue their business when facing poor financial prospects has declined. Feelings typically ran high after calamities that by themselves already caused the farming community great difficulties. Recently, animal welfare has become an important issue, which gained interest after the outbreak of classic swine fever in 1998, and foot and mouth disease in 2000 (Landbouw Economisch Instituut, 2000). This has led to increased dialogues between farmers and society, in order to obtain a renewed "license to produce" (e.g., Bachus & Van der Schans, 2000). A second important issue is food safety, which gained renewed interest after the BSE and dioxin crises in 1999. A third issue concerns environmental pollution caused by the use of pesticides, fossil fuels and the emission of minerals and ammonia (Landbouw Economisch Instituut, 2000) Finally, the rural area in The Netherlands increasingly urbanized, that is it becomes more and more a mixed business and residential area. Because of an increasing need to expand areas for housing, business activities and infrastructure on the one hand, and scenic areas and nature reserves on the other hand, agriculture had to compete with other activities for space.

Consequences of Changing Perspectives for the Dutch Farm Family

In spite of the aforementioned structural developments, the fact that practically all farms in The Netherlands are family businesses has not changed (Arachne Vrouwenadviesbureau Overheidsbeleid, 1997). The most important characteristic of the family business is that capital, management, labor, and land are combined into one single unit (Gasson & Errington, 1993). Family members, related by kinship or marriage, own the farm and provide most of its capital. Additionally, they are in management control and do a large part of the

farm-work themselves. Moreover, work and home are closely intertwined. Most farm families live at their farm, and with the passage of time, business ownership and managerial control are usually transferred to the next generation. In The Netherlands, farms have generally been in the family for many generations and farmers were raised to take over the business from early childhood. For this reason, they feel a strong emotional attachment to the farm, which is not only their business, but also their home and the place where they grew up.

The developments in the agricultural sector had severe personal consequences for Dutch farmers and their families as well. Most importantly, many farm families have experienced financial problems. For instance, between 1988 and 1995, for 28% of the businesses farm-incomes had structurally been below subsistence level, i.e. for four to five years uninterruptedly (Van Everdingen, Venema & Van Bommel, 1999). As previous (inter)national farm studies showed, financial hardship relates to considerable distress, for instance to impaired mental and physical health (Berkowitz & Perkins, 1985; Duncan, Volk & Lewis, 1988; Hertsgaard & Light, 1984; Keating, 1988; Lorenz, Conger, Monague & Wickrama, 1993; Schubert-Walker & Walker, 1988; Schulman & Armstrong, 1989; Swisher Elder, Lorenz & Conger, 1998; Weigel, Weigel & Blundall, 1987; Welles & Defares, 1983). Moreover, many farm families saw the continuity of their business threatened. Qualitative studies proved that having to give up the farm has a profound negative impact on the emotional well-being of the farmers concerned (Giesen, 1993; Oomens, 1991; Rosenblatt, 1990).

In addition to financial distress, reorganizations and modernization processes also changed the nature of farm-work thoroughly (Welles & Defares, 1983). Initially, mechanization of manual labor relieved the farmer from many physical tasks, but caused farmers' mental load to increase, as the emphasis now shifted from craftsmanship to management skills and entrepreneurship.

Throughout the years, cognitive demands increased, for instance, with the introduction of computers that regulated the operational processes at the farm, such as feeding cattle or fertilizing crops. Additionally, governmental regulations have led to an increase in administrative work (Gorgievski-Duijvesteijn & Giesen, 1997; Venema, De Bont, Van Everdingen, Alleblas & Van Bommel, 2001), such as the obligation to keep a detailed administration on the input and output of minerals and ammonia, referred to as "mineral management".

In response to the changing situation, farmers also developed non-agricultural activities to generate additional income, such as nature conservation, agro-tourism, home processing and sales, and the provision of opportunities for rehabilitation and relaxation of special groups, such as the handicapped or sick children. Furthermore, a growing percentage started to work off-farm (Landbouw Economisch Instituut, 2000), because of which they could spend less time on farm work. As Keating (1988) showed, this often leads to feelings of dissatisfaction and guilt. Most Dutch farmers experienced the continuous need to adjust and the insecurity related to constantly changing prospects as very demanding and stressful (e.g., Giesen, 1991; Gorgievski-Duijvesteijn & Giesen, 1997). Additionally, in spite of all their efforts, farmers increasingly felt society criticized rather than appreciated them (e.g. Vinkers & De Hoog, 2000). Consequently, the motivation to continue farming in The Netherlands has declined, which was, for instance, illustrated by a growing interest in emigration to continue farming abroad. It is estimated that in the past few years, about 200 farm families with relatively large farms and good financial prospects left to farm abroad (Wijnen & Voskuilen, 2000).

Objective of the Study and Theoretical Background

Using a stress-theoretical perspective, this thesis aims at providing insight into the personal consequences of changing financial prospects of the

farm business for farmers and their spouses. In line with contemporary occupational stress approaches (Cox & Griffiths, 1995; Frese & Zapf, 1994), our research is based on a so-called stress perception model (see Figure 1.1). This model regards stress as a process in which objective stressors may lead to the subjective experience of stress, which, in turn, predicts stress-outcomes (strains). Strains may be affective (e.g., dissatisfaction, negative affect), cognitive (e.g., diminished commitment), or behavioral (e.g., quitting), or they may pertain to physical or mental ill health. Additionally, we will consider the possibility that strains might cause or aggravate stressors, the so-called reversed causation (cf. Zapf, Dormann & Frese, 1996). Finally, we expect personal differences to render one person more vulnerable than another to experiencing stress and to develop negative stress-outcomes in response to the appraisal of stressors.

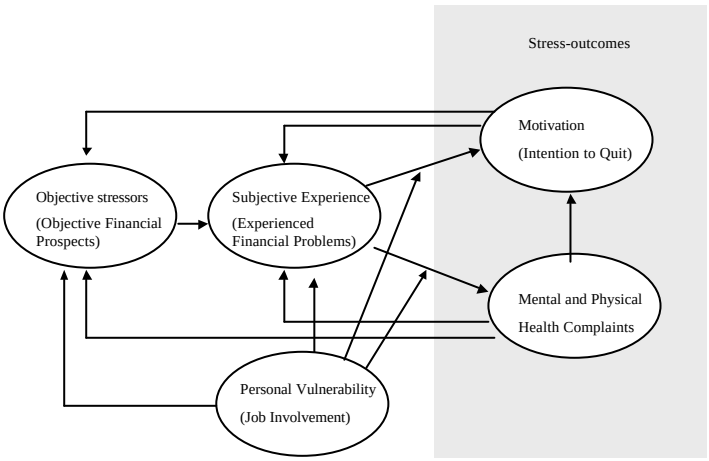

Figure 1.1. *The proposed research model.*

More specifically, our research is inspired by Conservation of Resources (COR) theory (Hobfoll, 1988; 1989; 2001). COR-theory is a motivational stress-theory, according to which people strive to build, protect and retain their resources. Resources are objects, personal characteristics, social circumstances, energies and conditions that are valued and sought after and foster the acquisition and accumulation of other resources. The means people have to do so, are the resources they posses. According to COR theory (Hobfoll, 1988; 1989; 2001), stress results from either a (potential) loss of resources, or when the investment of resources does not lead to the expected gain. An interesting feature of COR-theory is that, by centering the stress-process upon peoples' resources, reciprocal effects between stressors and strains become hard to ignore. After all, peoples' health and motivation are important resources that may foster the achievement of their goals (building, protecting, and retaining other resources).

Objective Financial Business Prospects

One of the main questions this thesis addresses is how objective financial business prospects impinge on farmers' minds. This is an important, yet under-investigated issue in occupational stress research. Measuring stressors objectively reduces the risk of methodological artifacts. For example, it reduces the probability of common method variance, which may lead to overestimation of the relationships between subjective measures of both stressors and strains. Moreover, the stressor-strain relationship needs not necessarily be similar for subjective stressors and their objective antecedents (e.g., Kasl, 1987). Focusing on objective stressors in addition to subjective experience may therefore reveal a part of the stress process that is particularly relevant for some purposes. For instance, the personal consequences of a poor objective financial perspective for the farm business may be of particular relevance for policymakers, which generally base their decisions on objective features of the agricultural sector. In

spite of repeated calls of several authors for using more objective indicators of job stress (e.g. Frese & Zapf, 1994; Hobfoll, 1988, 1989, 2001; Kasl, 1987, 1998), there are still only a few studies that investigated the effects of objective stressors (Frese & Zapf, 1994).

An important problem with using objective stressors is the question how to capture them. Our research focuses on the objective financial perspective for continuation of the farm (Mulder, 1994; 1996), from now on denoted as objective financial prospects, which means whether a farmer will have sufficient financial means to continue his or her business with the same operational characteristics, including size, location and business activities. Based on economic organization theory (Hendrikse & Schroeder, 1990; Panzar & Rosse, 1984), objective financial prospects are expected to depend on the behavior of different parties that have an interest in the business, being the farm-family, the bank, suppliers and the national government (Mulder, 1994, 1996). The primary aim of all parties concerned is to keep the business running. However, if the (financial) interest of any of these parties is not met, the party concerned may take actions that jeopardize the continuity of the business. Take for example suppliers. Suppliers are primarily expected to provide goods. However, if the farmer is unable to pay the bills, eventually the supplier will stop delivering, which impairs the productivity of the farm.

More specifically, the interest of the different parties can be translated into financial requirements that need to be met in the short, the middle and long term (Mulder, 1996; Mulder, Van der Veen & Van Bommel, 1999). In the short term, continuation of the business is threatened by liquidity problems. This means a farmer does not have sufficient liquid means to finance the daily routine, such as paying suppliers. In the middle term, farmers *additionally* need to be able to finance investments that are necessary to maintain or improve the farm's competitive position from a technical, economic or societal point of view. An indication of good financial prospects in the middle term is the

modernity of the durable assets, such as buildings and machinery. Finally, in the long term, on top of good liquidity and modernity, farmers need sufficient solvency to finance large structural changes. This may be financing take-over when the current farmer wants to retire. However, sufficient solvency might also pertain to financing large adjustments in order to cope with restructuring of the agricultural sector, such as moving to farm elsewhere or increasing the farm size dramatically.

Hence, given this complexity of the farmers' financial situation, a multifaceted indicator is proposed to measure objective financial prospects, comprised of liquidity, modernity and solvency. A suchlike indicator has several advantages above the single indicators that have been used in most previous studies, such as debt to asset or debt to gross sales ratios (Keating, 1988; Welles & Defares, 1983), debt-load (Cary & Weston, 1978; Welles & Defares, 1983), or low gross income (Cary & Weston, 1978; Duncan, et al., 1988; Schulman & Armstrong, 1989; Swisher, et al., 1998). Our multi-faceted indicator shows a more comprehensive picture of the farm's financial situation. Moreover, the rules for evaluating whether it indicates a good or a poor business perspective are theory-driven, taking into account expectations for future developments of the farm and its environment. Indeed, validation studies have shown that the proposed multi-faceted indicator is a good predictor of actual business foreclosure at the branch level, for instance for fruit growing (Baltussen & Van der Veen, 1999), pig and poultry farming (Daatselaar, Van der Vleuten & Backus, 1999) and horticulture under glass (Landbouw Economisch Instituut-Dienst Landbouwkundig Onderzoek, Proefstation Bloemisterij en Glasgroenten & Centrum voor Landbouw en Milieu, 1998).

Objective Business Prospects and Experienced Financial Problems

Now that we have identified the relevant objective stressor, the second important question is to what extent poor objective financial prospects lead to

experienced financial distress. This may seem trivial. In their position as self-employed, farmers can be considered to know their own financial situation well. If we, for instance, assess a farmer's objective financial prospects to be excellent in both the short and the long run, we do not expect him or her to experience financial hardship. In a similar vein, if farmers' objective financial means are assessed to be insufficient to fulfill short-term financial obligations, such as paying suppliers, it is hard to imagine they may be unaware of it. However, to some extent this may be plausible. As a farmer in one of our interviews said: "My wife doesn't need to tell me all the time about the bills she hasn't been able to pay. Right now, I need all my attention to keep the farm running. That's the best I can do. My output is what pays the bills."

So far, only two other farm-studies have addressed the relationship between objective indicators of the financial situation of the farm (i.e. family income and the ratio of debt to asset) and subjectively experienced financial hardship (Armstrong & Schulman, 1990; Lorenz, et al., 1993). These studies show that two indicators, family income and debt-to-asset ratio, predict the extent to which farmers experience financial problems in the household. Experienced financial problems, in turn, relate to depressive symptoms for both farmers and farm-wives. However, because these studies did not have full-lagged longitudinal designs, no firm conclusions could be drawn concerning causality. Our research extends the knowledge derived from those studies by focusing on other aspects of the objective financial situation. Moreover, we have tried to avoid methodological problems that may artificially suppress the relationship between objective financial prospects and experienced financial problems, such as unreliable measurement, for instance by using latent factor structural equation modeling (Frese & Zapf, 1994). Finally, causality and reversed causality will be investigated.

Psychological Consequences of a Poor Financial Situation

The core question of this thesis is whether a poor financial situation (both objectively and subjectively) affects farmers' well-being. Based on COR-theory (Hobfoll, 1988; 1989; 2001), a poor financial situation is expected to lead to impaired well-being, because financial means are important resources. First, money may have intrinsic value, or it may be appreciated because it represents something else which is valued, such as security and status (Hobfoll, 1988). Second, money also has exchange value, being an important resource for running the farm and fulfilling family needs (Gasson & Errington, 1993). Therefore, when financial means are insufficient or lost, stress is expected to ensue.

A unique feature of this thesis is that the relationship between the financial situation and well-being are put in a time perspective. Two important time-related aspects will be addressed. First, the impact financial problems have on well-being at different time intervals, varying from simultaneous effects to effects after as long as ten years. Second, the impact of developments in the financial situation over time will be investigated. More specifically, we will investigate how a stable versus a changing financial situation affect well-being. Up till now, the role of time in the stress process has received limited attention in occupational stress research, but in longitudinal research, the developments of the stressor or the course of the stress-process over time are crucial. Ignoring developments over time may not only conceal important information, but it may even lead to erroneous conclusions (e.g., Frese & Zapf, 1994). The most common one is that the impact of a stressor is underestimated. This is because the effect of most stressors is expected to be temporary or even to peak at a specific point in time. Therefore, when testing the stress-effect of a particular stressor, there is a reasonable chance of using time lags that are either too long or too short to capture the maximum effect. This phenomenon is likely to play a role in surveys studying the effect of daily stressors among a

large number of subjects in real life, since they are unlikely to have experienced the same stressors at the same time.

Two different kinds of models can be distinguished explaining possible stress-effects in the course of time (cf. Frese & Zapf, 1994), namely the initial impact model and the exposure time model (See Figure 1.2). The effect of the financial situation on farmer's well-being is expected to be a combination of both. Following the *initial impact model*, when farmers first realize that they have financial problems or that they may encounter them in the near future, they are expected to experience immediate, short-term distress. After some time, when the consequences of financial distress on different life domains have become clearer and feelings of insecurity decrease, or when farmers have found ways to adjust to experiencing financial problems, the deteriorating effect on well-being may weaken.

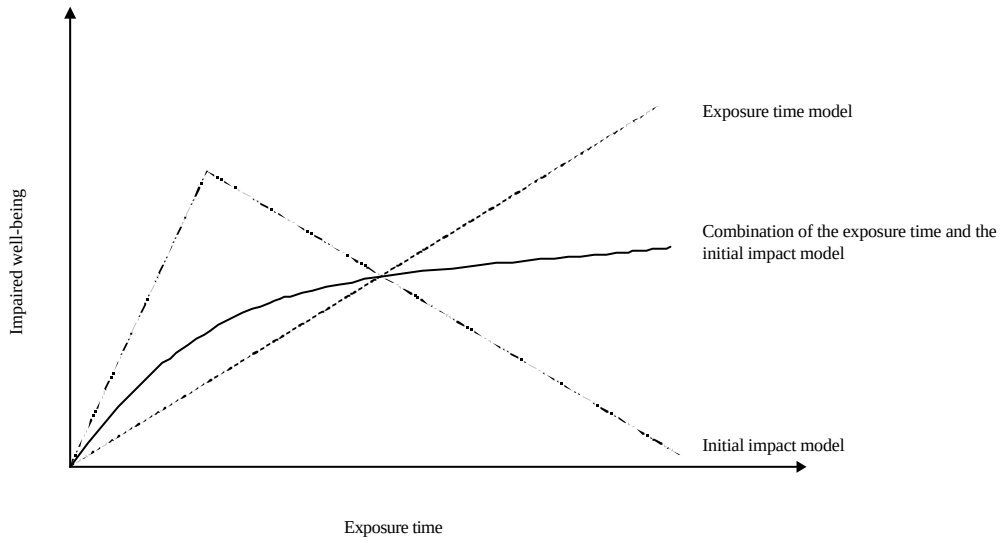

Figure 1.2. *The relationship between a poor financial situation and well-being over time, according to the initial impact model, the exposure time model and a combination model (cf. Frese & Zapf, 1994).*

However, the coping strategies farmers may develop to counteract financial problems may not be without costs and, therefore, they may lead to increased strain over time, as hypothesized in the *exposure time model* (Figure 1.2). Initially, small adjustments may be made (cf. Hobfoll, 1988; 1989; 2001), i.e. those resources will be invested which are easily replenished, promise the highest probability of success and the smallest probability of further resource loss. Examples are investing a few hours working off-farm, demanding suspension of payment, or postponing small maintenance investments. If financial problems are short-lived, as soon as they have been solved, the distress related to it is expected to decrease or they may even lead to positive effects on well-being, by replenishing other resources, such as confidence in internal strength or stronger social networks (see also Aneshensel, 1996).

In the long run, however, farmers may get trapped in a so-called "loss-spiral" (Hobfoll, 1988). Financial problems may lead to the investment of more and more important resources, resulting in a depletion of those resources and consequently in increased mental health problems. For instance, previous studies have shown that it is quite common for farmers to use their family's financial resources to solve financial problems at the farm, by cutting down family expenditures (e.g., Leistritz, Ekstrom, Leholm & Wanzek, 1987; Rosenblatt, 1990), thus causing financial problems to cross over into the private domain. Furthermore, farmers may have to sell essential means of production, such as stocks and other assets, which, in turn, impairs the productivity of the farm. Eventually, farm-closure may even become inevitable and farmers may decide costs become too high and they may decide to quit.

Financial Consequences of Diminished Motivation and Deteriorated Health

In longitudinal research, the possibility of reversed causal effects deserves serious attention. Especially when studying the stress process among the self-employed, a true effect of deteriorated health and diminished

motivation on the financial situation seems plausible. After all, when the family provides most of the labor and is primarily responsible for all management decisions, as is the case for self-employed running a family farm business (see Gasson & Errington, 1993), they can be assumed to have a substantial influence on business productivity and hence on its financial situation. Clearly, motivation and good mental health may be important resources for doing so.

To our knowledge, reversed causal effects leading from stress outcomes to financial problems have not been studied among the farming population or among the self-employed in general. Among employees on pay role, studies among an educated middle class sample (Aldwin & Revenson, 1986) and among skilled blue collar workers (Glickman, Tanaka & Chan, 1991) did show that people with poor mental health had a higher risk of running into financial problems and were also less likely to recover from them. However, their situation is different from that of self-employed individuals, and therefore results may not generalize to farmers. For instance, the incomes of employees on pay role depend less directly on their own performance than for the self-employed. Therefore, for employees, a 'drift'- explanation may be given for the effect of mental health on their financial situation, rather than a 'true impact' explanation. That is, employees with better mental health may have 'drifted' towards better paid jobs, for instance, because they were selected for a promotion. On the other hand, employees with poorer mental health may have drifted towards worse paid jobs. For instance, previous studies among employees showed that those with poorer mental health were more likely to lose their jobs (Kessler, House & Turner, 1987; Taris, De Bok, Caljé, 1998). Additionally, they stayed unemployed for longer periods of time (e.g., Hamilton, Hoffman, Broman & Rauma, 1993) and if they found other jobs, they were paid less than employees with better mental health (Taris, et al., 1998). Such a 'drift' explanation is less likely to apply to farmers.

Emotional Involvement as a Possible Weakness

Previous studies have shown that the self-employed (Rosenblatt, De Mik, Anderson & Johnson, 1990) and in particular farmers (Rosenblatt, 1990; Gasson, 1973; Gasson & Errington, 1993) are highly involved in their jobs. All farm owner-operators and also many of their spouses were raised at the farm (Giesen, 1993). Therefore, farmers not just view farming as an economic activity, they are highly involved in farming as a way of life, both for themselves and for their families. Accordingly, when facing poor financial prospects, farmers may stay in farming at large material and non-material costs. They often manage to stay in farming even if, from an economic point of view, they no longer have the means to adjust to the farm's financial problems (Mulder, 1996). Because of their high emotional involvement, the recurrent farm crises are thought to be particularly stressful for farmers and their families.

To date, systematic studies on the stress-exacerbating effect of high emotional involvement are scarce. Two studies among employees showed that a higher involvement increased the stress-effect of job-stressors on satisfaction (Frone & Mayor, 1988), and on physical health and alcohol abuse (Frone, Russell & Cooper, 1995). However, in another study among a small sample, job-involvement was not found to strengthen the relation between job-stressors on job satisfaction, job-related anxiety and turnover intentions (Batlis, 1980). More systematic research is therefore merited.

Dyadic Processes

At the farm family business, the work and the private domain are closely intertwined. The typical features of the farm family business are therefore particularly suited for studying the dynamics between family members. The current thesis will address three issues concerning the stress process among spouses, related to the position of husbands and wives at the farm in The Netherlands.

In The Netherlands, farm-wives traditionally fulfill different roles at the farm than their husbands (Arachne Vrouwenadviesbureau Overheidsbeleid, 1997). At most farms, husbands are the farm-operators. Their primary responsibility is the work domain. Their wives are primarily responsible for the household and the family. Additionally, a growing number of farm-wives have careers outside farming (Arachne Vrouwenadviesbureau Overheidsbeleid, 1997). In 2000, the Dutch Central Bureau of Statistics registered about 108,000 male farm operators (CBS, 2000). On the other hand, although the majority of farm-wives are to some extent also involved in farm work, only 26,000 of the 61,000 farm-wives working at the farm were registered as farm-operators (CBS, 2000), most of whom ran their farms in a partnership with their husband. Moreover, a previous study showed that about two thirds of the women having partnerships with their husbands still only played a minor role in strategic and operational decision making (Overbeek, 1993).

As a consequence of their different roles, the question rises as to whether farm stressors, such as financial problems, affect farm-wives to the same extent as they affect their husbands. This needs not necessarily be the case. For instance, a farmer may more strongly feel that problems at the farm are his responsibility than his wife does. Consequently, farm stressors may be more relevant to him and thus lead to more distress for him than for his wife (cf. Barnett & Baruch, 1987). Another topic related to this issue is whether the financial situation affects the well-being of farm-wives differently than they affect their husbands. A previous farm study showed financial problems affected farm-wives particularly through social processes, namely diminished spouse support (Lorenz et al., 1993), which was not the case for their husbands. Therefore, we will study whether the well-being of husbands and wives influence *each other*. This may shed light on the question whether one spouse's stressors may affect the other spouse's wellbeing through crossover processes of strain (cf. Westman & Etzion, 1995). Crossover of strain may, for instance,

occur because diminished well-being of one spouse poses demands on the other spouse, such as a demand for social support. Crossover of strain may also be caused by empathic reactions.

Finally, our study will address the question whether reversed causal processes, i.e. impaired well-being affecting the financial prospects of the business, are similar for husbands and wives. So far, several farm-studies have addressed the stress process for both husbands and wives (e.g. Duncan, et al., 1988; Keating, 1988; Keating, Munro & Doherty, 1988; Lorenz et al., 1993). However, to our knowledge, no studies so far tested integrated models including relationships between the stress-reactions of husbands and wives, or reversed causal relationships.

Specific research topics and organization of the thesis

In sum, this thesis investigates how poor financial prospects for continuing the farm business affects the well-being of farmers and their wives. A special feature of the research project is that, in addition to causal relationships (i.e. a poor financial situation affects farmers' well-being), reversed causation (i.e. farmers well-being affects their financial situation) is investigated as well. More specifically, the following questions will be answered:

1) Do (changes in) a poor financial situation affect farmers' well-being, and particularly, do *objective* financial prospects matter?
2) Does farmers' well-being (or changes in well-being) affect their financial situation? And if this is the case, does that apply to both objective financial prospects and farmers' perception of financial problems?
3) Does farmers' job-involvement influence the relationship between the financial situation and well-being?
4) How does a poor financial situation and farmers' well-being affect the wives' well-being, and vice-versa.

These questions will be answered in the next four chapters. Each of these chapters is either published or submitted to a journal and therefore has its own specific hypotheses. Chapters 2 and 3 are based on data of a ten-year follow-up study among Dutch Dairy farm-couples, which started in 1986 (Giesen, 1991). The follow up took place in 1996. Chapters 4 and 5 are based on another study that included three waves of data, collected in 1998, 1999 and 2000, respectively.

Chapter 2 investigates the role of job-involvement in the stress process (Research question 3). The role of job-involvement has been shown to be paradoxical (Reilly, 1994). People who are highly involved in their jobs are generally found to be happier and healthier, presumably because their jobs give their lives existential meaning (e.g. Brown, 1996; Kanungo, 1982a; 1982b). However, highly involved employees have also been identified as potentially vulnerable to experiencing strain, when confronted with stressors that may threaten their professional role (Burke, 1991; Thoits, 1991; 1992; Frone, et al., 1995). We will examine the latter aspect of job-involvement (vulnerability) among 107 farm-couples participating in the second wave of our ten-year follow-up study. Specifically, we will test whether experienced financial problems, problems with current developments in the agricultural sector and threats to the autonomy as a self-employed had a stronger negative effect on well-being (i.e. job-related worrying and mental health complaints) for highly involved than for less involved farm-couples. In addition, gender differences are explored (research question 4).

The main purpose of Chapter 3 is to gain insight into long-term relationships between the financial situation and well-being, and dyadic processes between farmers and farm-wives. Based on data of 91 couples participating in both the first and the second wave of data-collection, Chapter 3

investigates whether couples who experienced financial problems in 1986 tended to have more health complaints ten years later (research questions 1 and 4). Additionally, a long-term effect will be investigated of the farm-couples' mental and physical health complaints in 1986 on their financial situation ten years later (research questions 2 and 4). We expect a long time lag to be particularly suited to study a possible reversed causal effect. Previous studies have shown health complaints to be very stable (Duncan-Jones, Fergusson, Ormel & Horwood, 1990; Ormel & Schaufeli, 1991). Therefore, even if health complaints only modestly affect the financial situation, over time, their effect may become substantial. Additionally, this study examines crossover effects of mental and physical health complaints between spouses (research question 4).

Chapters 4 and 5 present the results of a three-wave longitudinal study among 513 agriculturalists and horticulturalists, who filled out questionnaires in the spring of 1998, 1999 and 2000, respectively. This study was a joint project of Utrecht University and the Dutch Agricultural Economics Research Institute (LEI). This provided us with the unique opportunity to obtain information on objective financial prospects for each individual farm from an independent data source, namely the Farm Accountancy Data Network (FADN), and to match them with self-report measures of experienced financial problems and well-being.

More specifically, the role of objective financial business prospects is investigated in Chapter 4. To this end, reciprocal effects are tested between on the one hand the financial situation, measured both objectively and subjectively (research question 1), and on the other hand mental health complaints and intention to quit the farm business (research question 2). In other words, a negative "loss-spiral" (Hobfoll, 1988; 1989; 2000) will be tested: a poor financial situation leads to impaired health and vice versa, impaired health leads

to deterioration of the financial situation. Furthermore, this study also investigates to what extent a possible negative effect of a poor financial situation on well-being was due to negative *changes* in the financial situation over time (research question 1).

Finally, Chapter 5 approaches the relationship between the financial situation and health from another perspective. In this chapter, we proposed a "dynamic equilibrium" – model of resources. According to this model, peoples' resources are expected to have characteristic baseline levels (cf. Heady & Wearing, 1989), which are kept stable by internal, homeostatic processes. External influences, such as stressors, may cause resource levels to deviate from their characteristic baselines. However, we expect these influences to be temporary, since homeostatic processes will cause them to return to their original baselines. Testing a "stability and change" model of resources provides additional insights into time-related aspects of both causal and reversed causal relationships between the financial situation and well-being (research questions 1 and 2). Specifically, our study will test to what extent the financial situation and (mental and physical) health are stable resources over time. Subsequently, the relationships between stable and variable levels of the financial situation and health are examined.

In the concluding Chapter 6, results of the four studies are comprehensively discussed and the theoretical and practical implications of the studies are illuminated.

CHAPTER 2

JOB-INVOLVEMENT AND STRESS IN FARM-COUPLES[4]

As a farmer put it: 'I am my farm'. In a nutshell this example illustrates the idea behind Identity-Theory. According to Identity-Theory individuals fulfill different social roles, for example that of spouse, parent or worker (Burke, 1991; Thoits, 1991; 1992). Identification with social roles gives people existential meaning and purpose in life and this is generally expected to be beneficial for their well-being. However, it can also increase vulnerability to stressors stemming from a psychologically salient role, so-called role-relevant stressors: events that threaten possession of a social role, block the achievement of goals and values related to this role, or signs indicating that one is not meeting one's normative standards of role-performance.

This study set out to test whether identification with the professional role, or job-involvement (Lodahl & Kejner, 1965; Kanungo, 1982a; 1982b), intensifies the negative relationship between job-stressors (stressors relevant to the professional role) and well-being. Empirical studies that investigated such a relationship are scarce. Two studies among employees on pay role showed that job-involvement exacerbated the negative effect of stressors impairing successful role-performance on satisfaction (Frone and Mayor, 1988), and physical health and drinking (Frone, et al., 1995). However, in another study among a small sample, job-involvement was not found to exacerbate the

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[4] This Chapter has been published: Gorgievski-Duijvesteijn, M.J. (1999). Job Involvement and stress in farm couples, Gedrag en Gezondheid, 27, 109-117. The study was funded by the Dutch Ministry of Agriculture, Nature Management and Fisheries.

relation between role-perception on job satisfaction, job-related anxiety and turnover intentions (Batlis, 1980). Such results merit further investigation.

The present study was conducted among self-employed couples, namely Dutch farm-couples, a segment of the workforce that has hardly been researched by social and organizational psychologists. Yet, today the topic of job-involvement and stress is critical in the farming community, because of two features. First, previous studies have shown that job-involvement is generally high among the self-employed (Rosenblatt, et al., 1990, Thompson, Kopelman & Schriesheim, 1992) and in particular the farming population (Rosenblatt, 1990, Gasson and Errington, 1993). In the Netherlands, the farm has usually been in the family for many generations and most members of the farm-family have grown up in farm communities. Therefore, farming is more than an economic activity; it is a way of life, as was expressed in the above quotation. Furthermore, the farm-family is the main source of capital and labor and is, to an important extent, responsible for the tactical and managerial decisions concerning the farm. Therefore, as for the self-employed in general (Lewin-Epstein & Yuchtman-Yaar, 1991) business results and prospects may be easily interpreted as indicative of personal success, and losses as failures.

Second, the farming population in Europe currently faces a crisis. Developments such as changing governmental policies, growing international competition, and fall in prices of agricultural products are likely to be role-relevant. They cause economic strains and potentially threaten the continuity of the business. In addition, they conflict with norms about good role-performance. For example, depending on the government for permits to carry out investment plans conflicts with farm-values such as autonomous decision making and striving for independence as a self-employed person. The current developments have great impact on the farming population, and are, for example, associated with increased suicide rates in rural communities (Gallagher & Sheehy, 1994; Malmberg, Hawton & Simkin, 1997).

It is hypothesized that job-involvement exacerbates the negative effect on well-being of three stressors related to the current Dutch farm-crisis: 1) potential threats (problems with new legislation, changing farming methods and macroeconomic developments); 2) restrictions of autonomy and 3) financial problems. In other words, job-involvement moderates the relationship between stressors and wellbeing.

Another aim of this article is to explore gender differences. In the traditional farm setting work and home are closely integrated, physically, socially as well as financially. The current farm-crisis is therefore likely to affect the well-being of both husbands and wives, as was described in a qualitative study by Rosenblatt (1990). However, husbands and wives might not be affected to the same extent, because of two reasons. First, the division of labor on most farms follows traditional beliefs on the different core-roles of husbands and wives (Barnett and Baruch, 1987). That is: the husbands are the farm-operators and primarily responsible for the business. Although the number of female farm-operators is rising, the wives' primary responsibility is in most cases that of mother and homemaker, although they do some farm-work as well or hold a job off-farm (Arachne, Vrouwenadviesbureau Overheidsbeleid, 1997). Second, husbands often become farmers by succession and were raised and educated to be farmers from early childhood. Succession of the farm by a daughter is rare and women generally become farm-wives through marriage (Giesen, 1993). Until then they may never have thought of a future at a farm for themselves. It was thus hypothesized that job-involvement, in this case the identification with the professional role as a farmer, is stronger among husbands than among wives and that, as a consequence, the current problems relevant to this role have a stronger negative effect on well-being for husbands than for wives.

Method

Subjects

Data were obtained from 107 Dutch dairy farm-couples (response rate 67 %), taking part in a ten-year follow-up study (Gorgievski-Duijvesteijn & Giesen, 1997). Details about selection criteria are described elsewhere (Giesen, 1991). Trained students visited the farm-couples and administered highly structured interviews with husbands and wives separately. All husbands were farm-operators. The mean age of the husbands was 52 years (*SD* = 5.08), that of the wives 49 years (*SD* = 6.11). The husbands worked an average of 61 hours per week on the farm, the wives 16 hours. Besides the farmer and his family, no other persons were permanently employed on any of the farms. Of the husbands, 9.5% worked an average of 10.8 hours (*SD*= 8.24) off-farm, and 15.5 % of the wives for an average of 12.6 hours (*SD*=6.19). To illustrate that husbands and wives had different backgrounds: whereas 87,7% of the husbands had an agricultural education, none of the women had. Furthermore, 70.8% of the farmers agreed with the statement "I knew at a very young age that I would become a farmer", compared to 20.2% of the wives.

Measures

Apart from potential confounding variables (age and number of working hours per week) the following measures were included in the analyses.

Financial problems were measured by a 5-item scale, anchored by 1 'never/rarely' to 5 'very often' (Welles and Defares, 1983; Giesen, 1991). An example item: 'Lately, how often has it occurred that you have been unable to pay the bills on time?'. Cronbach's α was .81 for husbands and .83 for wives. Natural logarithms of the scores were used in the analyses to correct for skewness.

Potential threats to the continuity of the farm-business were measured by a 19-item checklist, anchored 1 'no problem at all' to 5 'a very large problem'.

The items were introduced by the question: 'Currently, to what extent are the following developments a problem for you?' This question was followed by a list of developments related to new legislation (e.g. environmental laws), changing farming methods (e.g. expansion) and macroeconomic developments (e.g. fall in prize of agricultural products). A pilot study (see Gorgievski-Duijvesteijn & Giesen, 1997), anecdotal material (Giesen, 1993) and articles in farm trade magazines, indicated that these developments place large demands on farm-couples. An exploratory factor analysis was performed on all 19 threat items (PCA extraction and oblimin rotation) (Ferguson & Cox, 1993). Although four factors were extracted with eigenvalues greater than unity, it was decided to compute one composite threat score, because of the very strong first factor (eigenvalue 7.27, eigenvalue second factor 1.56) Cronbach's α was .89 for husbands and .81 for wives.

Restrictions of autonomy were measured by a 6-item scale, specially developed for the purpose of this study. An example: 'Too many authorities interfere in the way we run our business.' The answers ranged from 1 'strongly disagree' to 5 'strongly agree'. Cronbach's α was .78 for husbands and .82 for wives.

Job-involvement was measured by a translated, 6-item version of Lodahl & Kejner's (1965) "Job-Involvement Scale". To ensure that the focus would be on the farm-role "my work" and "my job" were replaced by "our business" or "farming". An example item: 'The most important things in my life are related to our business'. The answers ranged from 1 'strongly disagree' to 5 'strongly agree'. Cronbach's α was .82 for husbands and .84 for wives.

Worrying, a specific, job-related indicator, was measured by a 4item scale from the "Vragenlijst Beleving en Beoordeling van de Arbeid [VBBA; Occupational Health Questionnaire] (Van Veldhoven & Meijman, 1994). An example item: 'After I have finished my work, I keep worrying about problems

related to the business' (yes-no scores, range 0-1). Cronbach's α was .69 for husbands and .72 for wives.

Mental health complaints, a more general indicator, were measured using a 10-item scale from the "Vragenlijst Organisatie Stress" [VOS-D, Organizational Stress Questionnaire] (Bergers, Marcelissen & De Wolff, 1986). Respondents were asked to indicate on a 4-point scale, anchored by 1 'never/rarely' to 4 'very often', how often they felt: angry, relaxed, confused, etc. Cronbach's α was .77 for husbands and .78 for wives.

Analyses

The data were analyzed using regression analyses. Because the data were obtained from couples, prior to testing the hypotheses it was determined whether correction for multilevel structure would be necessary, (Hox, 1995). A two level model only proved to be better for mental health complaints ($\Delta\chi^2_{(1)} = 6.89$, $p < 0.01$). Consequently, multi-level regression analyses were carried out for mental health complaints. For worrying, the hypotheses were tested using a classical hierarchical moderator regression analyses, method enter (Cohen & Cohen, 1983).

Results

Means, standard deviations and correlation coefficients of the study variables are presented in Table 2.1. As Table 2.1 shows, both husbands and wives scored relatively high on potential threats and restrictions of autonomy, whereas they reported relatively few financial problems. As predicted husbands were more involved than wives ($t_{(94)} = 4.88$, $p < 0.001$).

Finally, the scores on worrying and mental health complaints were comparable to those among employees. A recent study among 28,877 employees showed a mean score of .21 on worrying ($t_{(29,075)} = 1.16$, $p > .10$).

Table 2.1. *Means (M) standard deviations (SD) and correlation coefficients of the study variables. Upper triangle husbands, lower triangle wives (N=100 couples, listwise deletion).*

	Husbands		Wives		1	2	3	4	5	6
	M	*SD*	*M*	*SD*						
1.Potential threats	3.34	0.74	3.56	0.75	-	.30**	.33**	.14	.14	.18
2.Restrictions of autonomy	4.24	0.59	4.19	0.63	.23*	-	.03	.33**	.19*	.03
3.Financial problems	1.49	0.58	1.46	0.64	.15	.10	-	-.04	.32**	.33**
4.Job-involvement	3.36	0.79	2.97	0.82	-.03	.16	.03	-	.32**	-.05
5.Worrying	0.25	0.30	0.22	0.29	.18	.18	29**	41**	-	34**
6.Mental health complaints	1.71	0.39	1.75	0.41	.05	.08	.15	.12	36**	-

* $p < .05$, ** $p < .01$

(Van Veldhoven & Broersen, 1998). Bergers et al. (1986) report a mean score of 1.75 on mental health complaints among 2,800 employees ($t_{(2,998)} = -.05$, $p > .10$).

To test the supposed moderating effect of job-involvement on the relationship between role-relevant stressors and mental health, interaction terms of job-involvement and role-relevant stressors were tested (Table 2.2). Only one interaction effect proved to be significant. That is: job-involvement exacerbated the positive relation between financial problems and worrying. The regression lines of the standardized measures for individuals with scores on job-involvement of -1 *SD*, representing low job-involvement, and one for those with scores of +1 *SD*, representing high job-involvement are drawn in Figure 2.1. Table 2.2 further shows three significant direct effects: 1) Job-involvement related to more worrying; 2) Financial problems correlated positively with worrying and 3) mental health complaints. Interestingly, financial problems only explained variance in mental health complaints *on the couple-level*. Furthermore,

neither potential threats nor restrictions of autonomy directly affected worrying and mental health complaints.

Finally, it was tested whether husbands would be more affected by role-relevant stressors than wives. For this purpose regression analyses were carried out with interaction terms of gender and role-relevant stressors in addition to the main effects. None of the interaction terms turned out to be significant and the fit of the models containing interaction terms was not significantly improved (for worrying $\Delta F_{(3)} = 0.65$, $p > 0.05$ and for mental health complaints $\Delta\chi^2_{(3)} = 3.55$, $p > 0.05$).

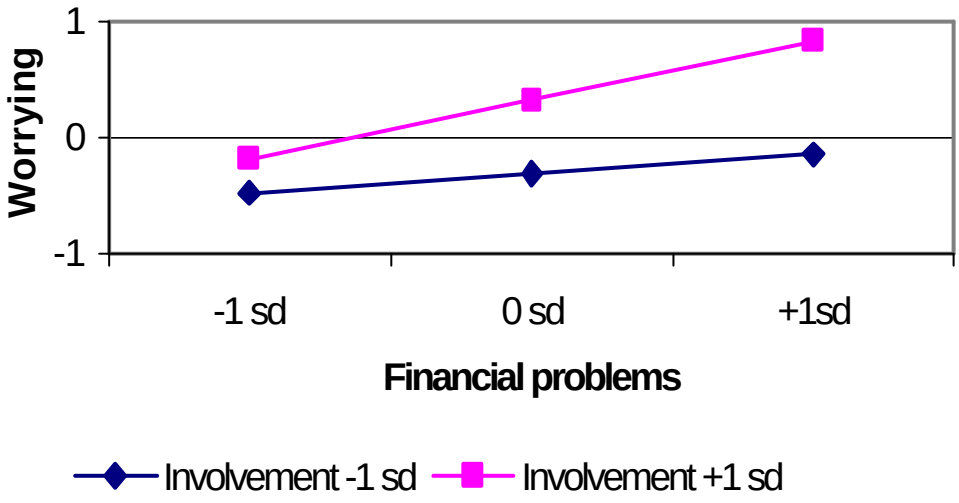

Figure 2.1. *Plot of the interaction effect of job-involvement on the relationship between financial problems and job-related worrying for husbands and wives (N=200, listwise deletion)*

Table 2.2. *Results of the regression analyses of satisfaction, worrying and mental health complaints in 100 Dutch farm-couples (listwise deletion).*

Predictors	Worrying			Mental health complaints			
	ΔR^2 (individual)	B (step 4)	(*SE*)	ΔR^2 (individual)	ΔR^2 (group)	B (step 4)	(*SE*)
Step 1	.01			.02	-- [1)]		
Sex		.02	(.08)			.06	(.11)
Age		.07	(.18)			-.01	(.01)
No. of working hours / week		-.00	(.00)			-.00	(.00)
Step 2	.13***			.00	-- [1)]		
Job-involvement (JI)		.11***	(.03)			.02	(.04)
Step 3	.10***			.00	.24**		
Potential threats		.02	(.03)			.02	(.04)
Restrictions of autonomy		.05	(.03)			.00	(.05)
Financial problems		.26***	(.05)			.26**	(.08)
Step 4	.05**			.00	.02		
JI x potential threats		.04	(.03)			.02	(.05)
JI x restrictions of autonomy		.07	(.04)			-.04	(.06)
JI x financial problems		.16*	(.06)			.08	(.09)
Overall R^2	.29			.01	.26		

* $p < .05$, ** $p < .01$, *** $p < .001$

[1)] The variance on group level slightly increased.

Discussion

The primary aim of this study among 107 farm-couples was to test the hypothesis derived from Identity-Theory, that job-involvement would exacerbate the negative relationship between role-relevant stressors and well-being. The results showed limited support: job-involvement intensifies the effect of only financial problems on job-related worrying for both spouses, whereas no such effect was found for potential threats and restrictions of autonomy as a self-employed person. Furthermore, no exacerbating effect was found for any of the three role-relevant stressors on mental health complaints.

It is remarkable that neither interaction-effects were found of potential threats and restrictions of autonomy with job-involvement on well-being, nor any direct associations between those two stressors and well-being, whereas financial problems did interact with job-involvement on worrying, and related directly to both worrying and mental health complaints. After all, scores on potential threats and restrictions of autonomy were rather high, in contrast to those on financial problems. Yet, financial problems seem to be most important. Possibly, although al three stressors were presumed to be role-relevant, financial problems pose a more direct threat to the continuity of the farm, and hence to "being a farmer" than the other two stressors. They may also more directly block the attainment of role-related goals and values and impair role-performance. Concerning the stress-moderating influence of job-involvement, such an effect might be restricted to role-relevant stressors *indicative* of poor role-performance. Self-employed generally experience their financial situation as an indicator of personal success or failure and hence may feel responsible for the onset of financial problems (Rosenblatt et al, 1990), which does not apply to the other two stressors. Future stress-research based on Identity-Theory should benefit from testing more specific hypotheses about the role-relevant nature of stressors.

Job-involvement was not found to exacerbate the effect of role-relevant stressors on mental health complaints, nor does it relate directly to more mental health complaints. Why not? Perhaps this study only demonstrates a short-term effect. Dutch dairy-farmers had been doing relatively well until the time of the data-collection (Landbouw Economisch Iinstituut-Dienst Landbouwkundig Onderzoek, 1995) and the problems they encountered may have been recent. Following the assumption that the stress-effect may lead from job-related stress-reactions (worrying) to more global reactions (c.f. Van Dijkhuizen, 1980), higher involved farm-couples may gradually develop more mental health complaints than less involved farm-couples, as problems persist or worsen over time. To test this possibility, a longitudinal study would be needed. Our data show some indication in this direction: the correlation between financial problems and mental health complaints drops from .23 to .14 when controlled for worrying.

The second objective of this study was to explore gender differences in the strength of the association between role-relevant stressors and well-being. Contrary to the hypothesis, the relation between role-relevant stressors and well-being was equal for both spouses. This was in spite the fact that husbands, most of whom had been raised to become farmers from early childhood, were all farm-operators, and, as expected, have a higher job-involvement than wives. Apparently, a higher job-involvement for husbands does not make them more vulnerable for job-relevant stressors than wives. The close integration of work and home might have obscured such an effect. First, financial problems, the only stressor that was found to relate to well-being in this study, probably not only affect the business, but also the financial resources that are available to the family. This would mean a threat to the fulfillment of other roles besides the professional role, which may have been more salient to the wives, such as that of a homemaker. Also, interaction processes between the spouses may have accounted for the findings. For example, financial problems have been found

to decrease social support and increase social undermining among couples (e.g. Vinokur, Price and Kaplan, 1996). Moreover, a study among farm-couples (Lorenz, et al., 1993) showed that financial problems lead to depressive symptoms for both spouses, but this relationship was mediated by lack of spouse support for wives, and by loss of control for husbands. It would be interesting to study how stressors affect the well-being of couples in more detail, for example by including the salience of other roles such as that of a home-maker or breadwinner, and to focus on the interaction processes between spouses.

The current farm crisis is a pervasive phenomenon in the Netherlands, as well as in other industrial countries, with far-reaching negative consequences for the well-being of farm-families. These effects are often intuitively associated with a high commitment of self-employed persons towards their business. However, so far, no quantitative studies had been conducted on this subject. Despite the limitations of a cross-sectional design and subjective measurements of both stressors and stress-outcomes, the current study provides some insight into the relationship between job-involvement and stressor experience among this poorly researched group. Apparently, job-involvement increases job-related worrying and exacerbates the effect of financial problems on job-related worrying. Although these results seem modest, one should bear in mind that the study was conducted among dairy-farmers, who had been doing relatively well until the time of data collection, as was reflected in the low scores on financial problems. If times should get worse, higher involved individuals might develop more generalized mental and physical health complaints than less involved individuals, because of their tendency to worry more. This indicates that it may be useful to provide self-employed with more helpful coping strategies to reduce job-related worrying, or to minimize the negative effects of worrying, for instance by using cognitive behavioral techniques.

CHAPTER 3

FINANCIAL PROBLEMS AND HEALTH COMPLAINTS AMONG FARM COUPLES: RESULTS OF A TEN-YEAR FOLLOW-UP STUDY[5]

The relationship between financial problems and health complaints has been studied extensively in a large variety of populations all over the world. Financial hardship has consistently been shown to relate negatively to mental and physical well-being. Depression and negative mood are the stress correlates most often reported, both in specific populations, such as adolescents (e.g., Ullah, 1990), students (Jou & Fukada, 1996, Roberts, Golding & Towell, 1998) and the elderly (e.g., Krause & Baker, 1992; Krause, Jay & Liang, 1991; Mendes de Leon, Rapp & Kasl, 1994), and in the general population (e.g., Friedemann & Webb, 1995; Pearlin, Lieberman, Menaghan & Mullan, 1981; Ross & Huber, 1985; Turner, 1995; Vinokur, Price & Kaplan, 1996; Voydanof & Donelly, 1989; Whelan, 1992). In addition, financial problems have been found to relate negatively to *physical* health (Jou & Fukada, 1996; Roberts et al., 1998; Krause & Baker, 1992), and they have been associated with health impairing behaviors, such as excessive alcohol use and abuse (e.g., Conger, Ge, Elder, Lorenz & Simons, 1994; Humphreys, Moos & Finney, 1996; Liberto & Oslin, 1995; Neff, 1993; Peirce, Frone, Russel & Cooper, 1996), drug use and tobacco consumption, and deteriorated health behavior (e.g., Conger et al., 1994).

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[5] This study has been published: Gorgievski-Duijvesteijn, M.J., Giesen, C.W.M., Bakker, A.B. (2000). Financial problems and health complaints among farm-couples: Results of a ten-year follow-up study. *Journal of Occupational Health psychology, 5*, 359-373

Thus, ample evidence exists that relates financial problems to health complaints in a wide range of different populations. This line of research will be expanded in the present study by investigating the association between financial problems and mental and physical health complaints among self-employed couples (more specifically farm couples). The self-employed have received very little attention in organizational psychology literature. This is surprising because the self-employed constitute an important part of our working population. For instance, in 1997, about 15% of the labor force in the European Union were employers or self-employed, about half of which ran small enterprises, working alone or with their families (Eurostat, 1998). Moreover, for the self-employed, financial issues are a central and ongoing concern, especially when compared to individuals who receive a regular salary. For instance, the economic situation is not only relevant for the welfare and consumption level of the family, but it is also an indicator of the economic success of the enterprise.

Financial Problems and Health Complaints in the Farming Population

Studies on financial problems and health complaints among the farming population showed the same results as those among the general population: mental and physical health related negatively to a decrease in income level (Duncan, et al., 1988; Welles & Defares, 1983), as well as to more enduring financial hardship (Berkowitz & Perkins, 1985; Hertsgaard & Light, 1984; Keating, 1988; Schubert-Walker & Walker, 1988; Schulman & Armstrong, 1989; Weigel, et al., 1987; Welles & Defares, 1983). Although most studies so far have been correlational, recently, several methodologically sound longitudinal studies have been carried out (Lorenz, et al., 1993; Swischer Elder, Lorenz & Conger, 1998). These showed that over a period of two to three years, financial problems are significant predictors of depression and negative affect in the farming population. However, the presence of a possible reverse or reciprocal causal effect was not assessed.

In comparison to these earlier farm-studies, the present study has unique features that may provide valuable additional insights into the relationship between farm couples' financial problems and their health. First, it will focus on the long term-effects, using a ten-year time lag. Second, both a causal *and* a reverse causal effect of financial problems and health complaints will be tested for both spouses.

Conservation of Financial Resources

The general idea underlying the present study originates from Conservation of Resources (COR) theory, a motivational stress theory according to which people strive to build, protect and retain their resources (Hobfoll, 1988, 1989). Resources are those objects, personal characteristics, social circumstances, energies and conditions that are valued and sought after, and aid the requirement of other resources. COR theory predicts that, when confronted with an opportunity to achieve resources, or with a (potential) loss of their resources, people will be motivated to obtain, maintain or retain these resources by investing other resources they possess. If this does not lead to the expected outcome, individuals will experience distress and may consequently develop health problems.

A farm couple's financial situation can be considered a resource in several ways. First, capital is an "object resource" (Hobfoll, 1988, 1989), which has intrinsic value or is appreciated because it represents something else which is valued, such as security or status. Second, capital is considered an "energy": a resource with important instrumental value. For farm families, this relates to the specific characteristics of a traditional family farm-business. Capital is a necessary means to run the farm and lack of financial resources may paralyze business activities. Furthermore, at the farm, work and home are closely intertwined and farm-families may invest resources from the home environment to compensate for financial problems at the business, for instance

by adjusting family expenses and by investing the money thus saved in new machines. Previous research has shown such an entanglement to be fairly common (e.g., Leistritz, et al., 1987; Rosenblatt, 1990).

Over time, COR theory predicts that less important or easily obtainable resources will be invested first (Hobfoll, 1988, 1989). Farm couples may, for instance, start by postponing small renovations, which reduces the value of the business, or one of the family members may invest a few hours and start to work off-farm. If financial problems are being solved within the near future, the distress related to it will decrease. After it has been resolved, short-term financial problems may even have a positive effect on distress, by replenishing other resources, such as confidence in internal strength or social networks (see also Aneshensel, 1996).

However, when financial problems persists over a longer period of time, farm couples may get trapped in a "loss-spiral" (Hobfoll, 1988, 1989): more and more important resources may be invested or lost, resulting in a depletion of resources and consequently in increased stress reactions. Farm couples may, for instance, have to sell essential means of production, such as land or cattle. Eventually, even the business may have to be given up. This would not only mean losing valued property, but also losing the most important source of income and farming as a way of life. Losing the farm has a great impact on the emotional and physical health of the couples concerned (Rosenblatt, 1990).

Impaired Health as a Cause of Financial Problems

Financial problems may cause health complaints, but building on COR-theory (Hobfoll, 1988,1989), one can argue that the reverse may also be possible. People do not just passively undergo stress, but they are also active creators of their environment. People have their resources for doing so, one of which is their health. In this vein, farm couples' health complaints may also be

predictive of financial problems. Farm couples can be assumed to have a substantial influence on the farm's productivity and hence on their financial situation, providing most of the labor themselves and being primarily responsible for all management decisions (see Gasson & Errington, 1993).

Studies providing evidence for a reversed causal relationship leading from health complaints to financial problems are scarce. Two longitudinal studies have addressed this issue, one among an educated middle class sample (Aldwin & Revenson, 1986) and one among skilled blue-collar workers (Glickman, et al., 1991). Results showed that individuals with poor mental health were more likely to experience financial hardship and were less likely to recover from it than those with better mental health. Other studies have provided indirect evidence. For example, a study among human service supervisory personnel (Wright, Bonett & Sweeney, 1993) showed that poor mental health impaired management qualities, such as goal emphasis, team building and work facilitation. Health problems have also been found to precede the occurrence of stressors, indicating that people with poor health may be less able to positively influence their environment. Poor mental health was found to prolong unemployment after lay-off among employees working in the automobile industry (Hamilton, et al., 1993). Furthermore, recent studies have shown that employees with health problems are less able to maintain or enhance their job resources, such as job-variety, opportunities for promotion and good relations with superiors and coworkers (Taris, 1999; Taris, et al. 1998). However, in a review of longitudinal studies in organizational stress-research (Zapf, et al., 1996), identifying fifteen studies addressing both causal and reversed causal relationships between stressors and health complaints, only half of the studies found evidence for a reversed causal relationship, the other half did not.

For the purpose of examining the reversed effect of health complaints on financial problems, the long-term longitudinal design of the present study is

particularly useful. Health has been found to have a large stable component (e.g., Ormel & Schaufeli, 1991), so its influence is expected to be constantly present. Therefore, even if the effect of poor health on the financial situation of the farm may be modest, in the long run its effect may become substantial, just like constant dripping wearing away the surface of a stone.

Crossover of Health Complaints between Spouses

Unraveling the long-term relationship between farm-couples' financial problems and husbands' and wives' health complaints raises the question of whether health complaints of one spouse may influence the health of his or her partner. That health complaints may be transmitted between spouses is obvious for contagious diseases such as the flu. However, concordance amongst spouses has also been found for non-contagious physical diseases, such as multiple sclerosis (Jones & Fletcher, 1992), and mental distress, for instance negative mood (e.g., Doherty, Orimoto, Singelis, Hatfield & Hebb, 1995; McIntosh, Druckman & Zajonc, 1994), depression (e.g., Howes, Hokanson & Lowenstein, 1985; Joiner, 1994; Westman & Vinokur, 1998), and occupational burnout (e.g., Bakker & Schaufeli, 2000; Bakker, Schaufeli, Sixma & Bosveld, 1998; Westman & Etzion, 1995). Several psychosocial mechanisms have been described to explain the transmission of health complaints between spouses (Westman & Etzion, 1995). Although these mechanisms primarily aim to clarify the transmission of *mental* health complaints, some of them can also explain other crossover effects, such as the effect of physical health complaints of one spouse on the mental and physical health complaints of the other.

First, having a sick partner may confront a person with demands (Westman & Etzion, 1995): the partner's illness may be an ongoing source of concern and the sick partner may need extra care or social support. Additionally, health complaints may be reflected in the way the sick partner behaves, which might be stressful. For instance, previous studies have shown

that individuals experiencing negative mood and depression were evaluated by their partners as being unusually withdrawn and detached (Jones & Fletcher, 1996) or even 'socially undermining' (Vinokur et al., 1996; Westman & Vinokur, 1998). The latter means that individuals are hostile, react negatively towards their partners and their efforts, and that they hinder their partners in attaining instrumental goals.

Second, demands that may have led to health problems in one spouse may crossover and pose demands on the other. Jones and Fletcher (1993) have found that marital partners can have rather accurate perceptions of each other's work-related stressors. In their study, the frequency of discussing work at home was positively related to mental health complaints for both spouses, presumably because it posed a demand for social support on them. Marital partners have also been found to compensate for spousal stress by taking over some of each other's household-tasks (Bolger, DeLongis, Kessler & Wethington, 1989; Pittman, Solheim, Blanchard, 1996).

Third, like contagious physical diseases, mood states of one partner may also affect the mood states of the other directly, for example through an active sympathetic reaction, or a process of 'tuning in' (Hsee, Hatfield, Carlson & Chemtob, 1990). Tuning in refers to people trying to imagine what the other person may feel, for instance by comparing the other person's situation with their own past experiences. Mental distress may also be 'caught' through an unconscious process of "emotional contagion", which has been defined as: "the tendency to automatically mimic and synchronize facial expressions, vocalizations, postures, and movements with those of another person and, consequently, to converge emotionally" (Hatfield, Cacioppo & Rapson, 1994; p.5). Hatfield and her colleagues argue that frequent exposure to another person's emotions and paying close attention to them is one of the conditions facilitating the transmission of mental distress. This is likely to be the case for

farm couples, who care for each other and share a great part of their lives together.

The Present Study

The central aim of this ten-year follow-up study among farm couples is to investigate the long-term pattern of relationships between couples' financial problems and husbands' and wives' mental and physical health complaints. These relationships will be tested simultaneously in an autoregressive model, thus controlling for relative stability of financial problems and mental and physical health complaints over time. The first hypothesis is that T1 financial

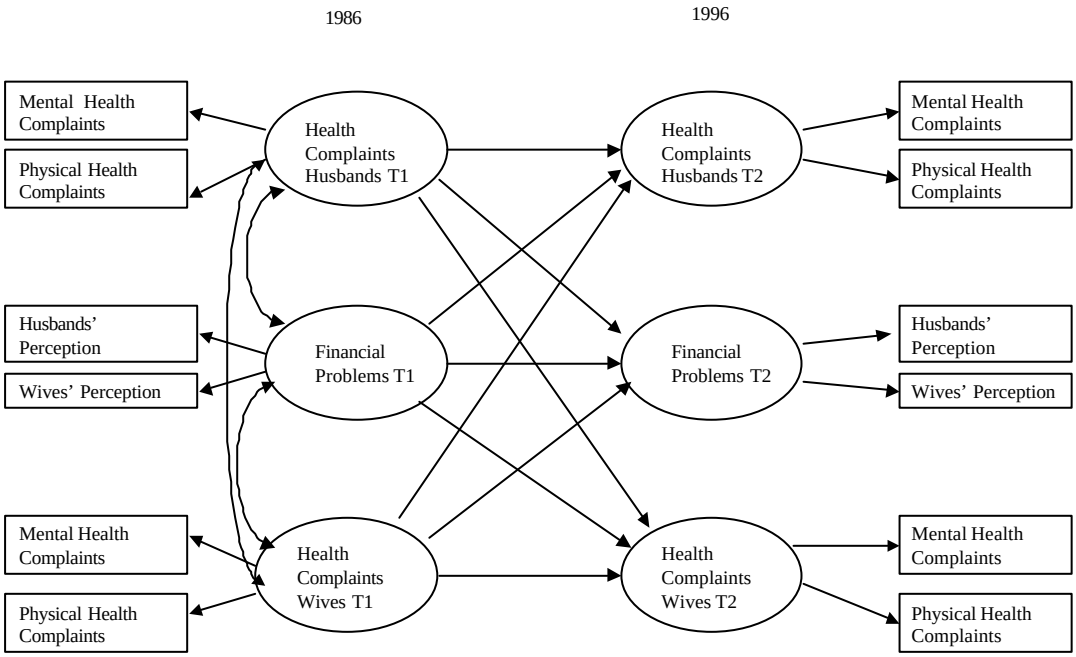

Figure 3.1. *The research model. T1 = Time 1; T2 = Time 2.*

problems are predictive of health complaints ten years later (T2). Hypothesis 2 states that T1 health complaints are predictive of T2 financial problems. These hypotheses will be tested for both husbands and wives. Additionally, the third hypothesis is that husbands' T1 health complaints are predictive of wives' T2 health complaints, and vice versa, i.e. wives' T1 health complaints are related to husbands' T2 health complaints. Figure 3.1 displays a graphic representation of our hypothesized model.

Method

Participants and Procedure

Data for this study were collected in 1986 and 1996 among Dutch dairy farm couples. In 1986, a sample of 182 couples (response rate 74 %) participated in a survey, including scales to measure financial problems, and mental and physical health (Giesen, 1991). This sample represented the Dutch population of dairy farm couples who were not in a transitional stage in 1986. It must be noted that, although the mean farm-size did not differ significantly from that of the Dutch Dairy farm-population (*M* = 55 milking cows, *SD* = 12), relatively small and large farms were not approached (range was 30 to 100 milking cows). Furthermore, the husbands were all between 32 and 50 years of age and had been farm-operators for at least five years.

In 1996, each of the couples was contacted again by letter, followed by a telephone call. It turned out that eight couples had transferred their farm to the offspring successor, four had switched to another branch in agriculture, ten were not traceable because they had moved to a farm elsewhere, and sixteen couples had completely stopped their farming activities. The main reasons these sixteen couples reported for discontinuation of their farming activities were age, health problems and not having a successor. Regression analyses showed that

1986 measures of health complaints and financial problems were not predictive of quitting.

The remaining 144 couples who were still working on their dairy farms were asked to participate in the second wave, 94 of whom responded (65 %). As during the first wave, trained students visited these couples and completed questionnaires in personal interviews with husbands and wives separately. Comparison of the couples responding in both the first and the second wave with those only participating in the first wave showed no significant differences regarding personal and family characteristics (age, education, health and mental health and family size) and farm characteristics (farm size and financial situation). In 1996, the mean age of the husbands was 52 years (SD = 5), that of the wives 49 years (SD = 6). In all cases, the husband was the farm operator and did most of the actual farm-work, namely an average of 61 hours per week (SD = 14), compared to an average 16 hours per week for wives (SD = 13). The wives were primarily responsible for the family and the home. On eight per cent of the farms, only husbands did actual farm-work; on 32 % of the farms, husbands and wives were both doing farm-work; and on 56 % of the farms, husbands worked together with their wives and one of their children. The number of children participating in actual farm-work had increased since 1986, when they participated only on 30 % of the farms. Furthermore, the mean farm size had decreased significantly (e.g., M = 48 milking cows, SD = 19, $t_{(96)}$ = -4.44, $p < 0.001$), but it was still within the mean range of Dutch dairy farms.

Measures

Perceived Financial Problems were measured with a 4-item Likert-scale, which was developed and used in a previous study in the Netherlands (Welles & Defares, 1983). The items were introduced with the sentence: 'Lately, how often has it occurred that …', followed by (1) 'you were unable to pay the bills on time?', (2) 'kept working with worn out machinery because you lacked

financial resources to replace them?', (3) 'Had to borrow money to pay off debts or cushion financial setbacks?', and (4) 'you did *not* have enough money to make ends meet?'. In 1986, the answers ranged from 1 'never/rarely' to 4 'very often'. Because the variance on the 1986 measure turned out to be somewhat limited (*SD*=.31 for husbands and .30 for wives), in 1996, the answers categories were changed into: 1 'never/rarely', 2 = 'now and than', 3 = 'sometimes', 4 = 'regularly', and 5 'very often'. Afterwards, it turned out that the variance was still somewhat limited (*SD* = .35 for husbands and .38 for wives). Scores were obtained from both husbands and wives and were used as two separate indicators of their financial situation. In 1986, Cronbach's alpha was .74 for husbands and .78 for wives. In 1996, Cronbach's alpha was .81 for husbands and .83 for wives.

Mental Health Complaints were assessed with a valid and reliable 10-item scale from the Vragenlijst Organisatiestress-D, [VOS-D, Organizational Stress Questionnaire; Bergers, et al., 1986.) This scale was originally developed by French and Kahn (1962). Participants were asked to indicate on a 4-point scale how often they felt angry, relaxed, confused, tense, etc. The answers range from 1 'never/rarely' to 4 'very often'. In 1986, Cronbach's alpha was .80 for husbands and .79 for wives. In 1996, Cronbach's alpha was .77 for husbands and .78 for wives.

Physical Health Complaints were measured with a 14-item scale from the VOS-D (Bergers et al., 1986). The items cover experiences such as headache, stomachache, changes in heart rhythm, dizziness and sleep disturbances. The answers range from 1 'never/rarely' to 4 'very often'. In 1986, Cronbach's alpha for this scale was .77 for husbands and .89 for wives. In 1996, Cronbach's alpha was .92 for husbands and .86 for wives.

Analyses

We tested the hypotheses in a path model, using latent variables in a structural equation model (SEM) with the EQS program (Bentler, 1989; Dunn, Everitt & Pickles, 1994). Missing values were listwise deleted, leaving 91 couples in the analyses. We used the scores of husbands and wives on the scale measuring perceived financial problems as two separate indicators of one latent variable "financial problems" in 1986 (T1) and 1996 (T2), respectively. The scores on the individual items measuring physical health complaints were generally low, suggesting they were psychosomatic in nature. Furthermore, the scales measuring mental and physical health complaints turned out to be highly correlated (see Table 2.1). For this reason, we used the scales measuring mental and physical health complaints as two separate indicators of one latent variable "health complaints", for husbands and wives separately, both at T1 and T2. The scores on all indicators had an inverted J-shaped distribution, showing that most of the participants reported only mild financial problems and few health complaints. Therefore, prior to the SEM analyses, we performed a natural logarithmic transformation on each of the scales (cf. Dunn et al., 1994).

To examine how close competing models fit to the data, we calculated several indices (Bentler, 1989; Hu & Bentler, 1995). The first is the traditional goodness of fit index Chi-square ($\chi 2$), which shows the magnitude of the discrepancy between the hypothesized and the observed covariance matrix. Since this discrepancy should be small, the $\chi 2$ should be non-significant. In addition, we used several other general fit indices that counteract problems associated with the $\chi 2$, such as the influence of a small sample size. The first of these is the Satorra-Bentler scaled $\chi 2$, based on GLS method, which has been recommended for use in small samples. We will also present some incremental fit indices, the Comparative Fit Index (CFI) and the Bonnet nonnormed fit index (NNFI), which compare the fit of the hypothesized model to a

Table 3.1. *Means, standard deviations and correlations of the observed variables, N=91*

	Scale score	*M*	*SD*	1	2	3	4	5	6	7	8	9	10	11
Time 1														
Husbands														
1. Perceived Financial Problems	1-5[a]	1.49	(.86)	-										
2. Physical Health Complaints	1-4	1.21	(.22)	.28**	-									
3. Mental Health Complaints	1-4	1.53	(.35)	.45**	.54**	-								
Wives														
4. Perceived Financial Problems	1-5	1.53	(.65)	.63**	.20*	.32**	-							
5. Physical Health Complaints	1-4	1.32	(.41)	.26*	.18	.29**	.19	-						
6. Mental Health Complaints	1-4	1.71	(.39)	.29*	.20**	.32**	.21**	.68**	-					
Time 2														
Husbands														
7. Perceived Financial Problems	1-5	1.54	(.68)	.53**	.28**	.44**	.38**	.20*	.22*	-				
8. Physical Health Complaints	1-4	1.61	(.36)	.21*	.52**	.40**	.15	.13	.15	.21*	-			
9. Mental Health Complaints	1-4	1.27	(.32)	.33**	.40**	.59**	.24*	.21*	.23*	.32**	.45**	-		
Wives														
10. Perceived Financial Problems	1-5	1.32	(.38)	.46**	.24*	.38**	.50**	.17	.19	.54**	.18	.28*	-	
11. Physical Health Complaints	1-4	1.50	(.70)	.27*	.26*	.42**	.20*	.59**	.43**	.24*	.19	.30**	.21*	-
12. Mental Health Complaints	1-4	1.74	(.39)	.25*	.24*	.38**	.18	.36**	.39**	.22*	.18	.28**	.19	.49**

Note. All correlations are based on the natural logarithmic transformations of the scores,

[a] To compare means, Time 1 scores have been rescaled from 1 to 4 into 1 to 5.

* $p < .05$, ** $p < .01$

null-model. Finally we will present a parsimony index, the root mean square error of approximation (RMSEA). For the CFI and the NNFI, a value larger than .90 is generally considered acceptable. Browne and Cudeck (1993) have suggested that a RMSEA value of .05 indicates a close fit, and that values up to .08 represent reasonable errors of approximation in the population.

Results

Descriptives

Table 3.1 presents means (*M*), standard deviations (*SD*) and the correlation matrix of the scores on perceived financial problems, and mental and physical health complaints at T1 and T2 for husbands and wives separately. To compare the mean levels of financial problems at T1 and T2, the scores were temporarily corrected for different scaling. As can be seen, the absolute values for all variables are rather low. Furthermore, the level of financial problems had not changed significantly over time, for both husbands and wives: $t_{(90)} < 1$, ns. However, for husbands, mental health complaints had increased significantly, $t_{(90)} = 5.13$, $p < .001$, as well as physical health complaints, $t_{(90)} = 2.57$, $p < .01$. For wives, only mental health complaints had increased significantly, be it slightly over time, $t_{(90)} = 2.94$, $p < .01$. Furthermore, husbands and wives reported about an equal number of health complaints. Only in 1986, husbands reported fewer physical health complaints than wives, $t_{(90)} < 2.72$, $p < .01$.

As the correlations show, mental and physical health complaints were strongly related. Mental health complaints correlated somewhat stronger with financial problems than physical health complaints, but the differences were rather small.

Model Testing

As recommended by Jöreskog and Sörbom (1993), we tested the hypothesized model following a stepwise procedure. Prior to testing the

hypothesized structural relationships, we tested three different measurement models to obtain an optimal basis for further analyses (cf. the two-step approach of Anderson & Gerbing, 1988). Table 3.2 presents the fit indices of the different measurement models.

All measurement models included the six latent variables (T1 and T2 financial problems, husbands' T1 and T2 health complaints and wives' T1 and T2 health complaints), the twelve indicators of these latent variables, and paths leading from the latent variables to the indicators. Furthermore, each of the models contained covariances between all latent variables. The three measurement models differed in the extent to which we allowed the error terms of the indicators to covary. The first model tested was a true score model, which does not allow any covariances between error terms (Fergusson & Horwood, 1988). This model did not fit to the data ($p < .05$, see Table 3.2).

Secondly, we tested a common factor model, which allows covariances between all T1 and T2 error-terms of identical indicators (Fergusson & Horwood, 1988). The rationale behind this is that identical measures are likely to be related over time because of systematic error that is not of theoretical interest, such as response bias. This may attenuate the covariances among latent

Table 3.2. *Fit indices of the different measurement models, N=91*

	df	χ^2	*p*	scaled χ^2	*p*	CFI[a)]	NNFI[b)]	RMSEA[c)]	90% Confidence Interval RMSEA
True Score	39	56.96	.03	59.46	.02	.95	.92	.07	.02 - .11
Common Factor	33	32.36	.50	33.90	.42	1.00	1.00	.00	.00 - .08
Adjusted Common Factor	35	33.45	.55	34.68	.48	1.00	1.01	.00	.00 - .07

[a)]CFI = Comparative Fit Index. [b)] NNFI Non-normed Fit Index. [c)] Root Mean Square of Approximation

constructs. The model-fit of this common-factor measurement model was significantly better than that of a true-factor model, $\Delta\chi^2_{(6)} = 24.60$, $p < .001$. Although the common factor model fitted the data well, $\chi^2_{(33)} = 32.36$, $p = .50$, the Wald test for dropping parameters (Bollen, 1989) showed that two of the six relationships between the error-terms of the indicators were not significant: those of husbands' T1 and T2 perception of financial problems and wives' T1 and T2 mental health complaints. Therefore, we revised the common-factor model and the non-significant covariances were constrained to zero. The resulting measurement model showed a close fit to the data, $\chi^2_{(35)} = 33.45$ $p = .55$, and was used as the basis for testing our hypotheses. In this model, all paths from the latent variables to the manifest variables were highly significant ($p < .001$).

Table 3.3 presents the correlations between the latent variables in the revised common-factor model. As is shown, the autocorrelations, which are the

Table 3.3. *Correlations among the latent variables, N=91*

	1	2	3	4	5	6
Time 1						
1. Financial problems	-					
2. Health Complaints Husbands	.54***	-				
3. Health Complaints Wives	.37**	.40***	-			
Time 2						
4. Financial problems	.72***	.61***	.35*	-		
5. Health Complaints Husbands	.34**	.82***	.23	.43***	-	
6. Health Complaints Wives	.32*	.62***	.69***	.43**	.50***	-

*** $p < .001$, ** $p < .01$, * $p < .05$

correlations between identical factors on both measurement moments, were very high, ranging from .71 to .80. This indicates high (relative) stability of both the couples' financial problems and of their health complaints over a ten-year time period. Furthermore, except for the relationship between wives' T1 health complaints and husbands' T2 health complaints, which had a z-statistic of 1.91 ($p < .06$), all correlations between the latent variables were significant.

Subsequently, we tested the hypothesized structural model (Figure 3.1). This model fits rather closely to the data (Table 3.4), although not all predicted structural relationships are significant. First, we found no support for Hypothesis 1, according to which, over a ten-year time period, financial problems are predictive of health complaints: the paths leading from T1 financial problems to T2 health complaints were not significant for either husbands or wives. Second, Hypothesis 2, which predicted the reversed relationship leading from health complaints to financial problems, was supported for husbands: the more health complaints husbands had at the first measurement moment, the more severe were the couples' T2 financial problems. Results did not show an effect of wives' T1 health complaints on the couples' T2 financial problems. Finally, concerning the third hypothesis

Table 3.4. *Fit indices of the different structural models, N=91*

	df	χ^2	*P*	scaled χ^2	*p*	CFI[a)]	NNFI[b)]	RMSEA[c)]	90% Confidence Interval RMSEA
Hypothesized Model	38	33.90	.66	35.19	.60	1.00	1.02	.00	.00 - .06
Revised Model	42	36.41	.71	37.28	.68	1.00	1.02	.00	.00 - .06
Revised Model with Correlated T2 Residuals	39	35.52	.63	36.27	.60	1.00	1.02	.00	.00 - .06

[a)]CFI = Comparative Fit Index. [b)] NNFI Non-normed Fit Index. [c)] Root Mean Square of Approximation

predicting a long term crossover effect of health complaints between spouses, the model showed an effect of husbands' T1 health complaints on wives' T2 health complaints, but *not* vice-versa.

In the final step of the SEM-analyses, we removed all non-significant relationships from the model. The final model is displayed in Figure 3.2. The percentage of variance explained by the model was thirteen percent for financial problems, seventeen percent for husbands' health complaints and fourteen percent for wives' health complaints.

Additionally, we explored whether the variables included in the model sufficiently explained all systematic variance between the variables at T2, by allowing the disturbance terms, or unique factors, of T2 latent variables to

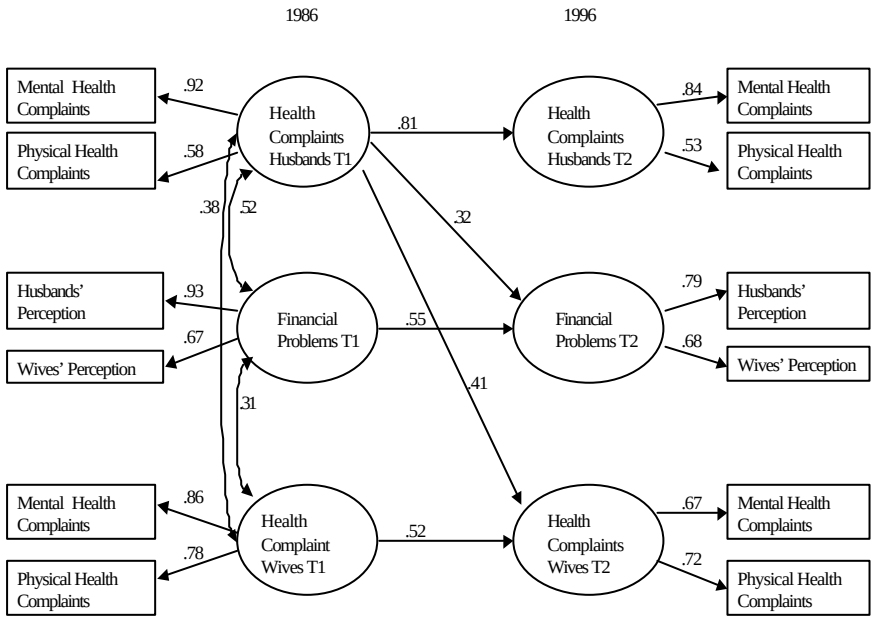

Figure 3.2. *Long-term relationships between financial problems and health complaints among farm-couples: final solution of the structural model. N = 91. T1 = Time 1; T2 = Time 2*

covary. None of these covariances between the T2 disturbance terms turned out to be significant and, consequently, adding these parameters to the model did not improve the fit of the model significantly, $\Delta\chi^2_{(3)} = 0.89$, $p > .10$ (see Table 3.4). This means that the relative stability of financial problems and husbands' and wives' health complaints, the relationships between these variables at T1 and the longitudinal relationships between, on the one hand, the T1 husbands' health complaints and, on the other hand, T2 financial problems and wives' T2 health complaints sufficiently explained the relationships between the variables at T2.

Discussion and Conclusions

This study set out to test both causal and reversed causal relationships between couples' financial problems and husbands' and wives' mental and physical health complaints over a ten-year time period. Additionally, we investigated a possible long-term crossover effect of health complaints from husbands to wives and vice versa. The relationships were tested simultaneously, using structural equation modeling (SEM).

The first interesting finding was the relative stability of both financial problems and health complaints. Financial problems in 1986 explained ten per cent of financial problems in 1996. For health complaints these percentages ranged from twelve per cent for wives to fifteen per cent for husbands. This means that farm-couples who had more financial problems and/or more health complaints than other couples in 1986, also tended to have so ten years later. High relative stability of both financial problems and health complaints is not unusual and was, for example, also found in an earlier farm-study by Lorenz et al. (1993), who explained it in terms of a "dynamic equilibrium". According to the dynamic equilibrium model (Heady & Wearing, 1989), exogenous forces generally cause only temporary changes in levels of (life-)event exposure and health complaints. Stable personality characteristics would cause these levels to

return to their original baselines. Rephrased in terms of Hobfoll's (1988, 1989) conservation of resources theory, personality characteristics would be one of the resources people have to counteract (potential) losses, among others such as personal competence, knowledge and social networks.

Despite the overall stability in both financial problems and health complaints, two lagged effects were found, both of husbands' T1 health complaints. First, supporting our hypothesis of reversed causation (Hypothesis 2), husbands' health complaints predicted the couples' financial problems over ten years of time. Note that our measure of financial problems was *not* merely a self-report, but it was based on consensus between both spouses about rather objective aspects of their financial situation. This association indicates that poor mental and physical health may impair running the farm-business effectively. There may also be other explanations, though. Poor health may, for instance, confront a farm couple with high medical costs. However, yet another finding underscores the likelihood of reduced effectiveness: in contrast to husbands' health complaints, wives' health complaints did *not* predict financial problems. Whereas medical costs would probably not explain this gender difference, reduced effectiveness would. After all, the husbands in our sample were all farm operators and primarily responsible for the business. Their wives' primary responsibility was the home and the family, even though many of them did farm work as well and participated in decision-making. This division of labor resulted in, for example, husbands spending far more hours doing actual farm-work. For this reason, husbands' (reduced) effectiveness may have had more impact on the couples' financial situation than wives' effectiveness.

Secondly, over a ten-year time period, husbands' health complaints were predictive of wives' health complaints (cf. Hypothesis 3). Vice versa, no long-term crossover effect was found. Although this latter finding is not consistent with results from some previous studies showing the crossover effect to be bi-directional (e.g., Bookwala & Schulz, 1996; Pleck & Staines,

1985; Westman & Etzion, 1995; Westman & Vinokur, 1998), there are some plausible explanations. First, as some authors have found, women may be more vulnerable to "catching" other peoples' psychological distress, because traditional gender roles may have taught them to be more sensitive to emotions displayed by others than men. Additionally, interpersonal stressors may be more relevant to them, and consequently have stronger stress-effects (Hatfield et al., 1994). Second, men and women may react differently when confronted with spousal stress. In studies on dyadic adjustment processes (Bolger et al, 1989; Pittman et al , 1996), women tended to react by taking over household tasks to compensate for their spouses job-stress. Such a complementary reaction was not found for men. Third, when confronted with stressors, husbands may appeal more strongly to their spouses, as suggested by the findings of a recent study (Jones & Fletcher, 1996). These researchers found that husbands tended to have smaller social networks and therefore depend more on their wives for social support. We believe that the latter two dyadic processes are particularly relevant for farm-couples. Farming requires constant attendance and physical presence, so when the farmer is ill and cannot fulfill his tasks, like feeding the cattle or milking, someone else needs to take over. As a previous study has shown (Giesen, 1991,1993), it is common practice for farm-wives to step in when necessary, whereas for farmers it is far less common to take over their wives' tasks (including household-tasks). Furthermore, anecdotal material of the Giesen study showed that husbands indeed shared personal problems only with closest kin, whereas wives also shared them with other relatives or friends.

No support was found for a long-term effect of financial problems on health complaints for either husbands or wives (Hypothesis 1). This seems to contrast with the results of other farm-studies using shorter time lags (Lorenz et al., 1993; Swisher et al., 1998). However, the cross-sectional relationships at T1 in the present study (Table 3.3) suggest that such a short-term relationship

from financial problems to health complaints may be present. The absence of a long-term effect of financial problems on health complaints is perhaps not surprising. The couples in this study had experienced rather mild financial problems, as the low average scores on this scale indicated (Table 3.1). Furthermore, their financial situation had not changed significantly over time. Had their financial problems been more severe, or had their situation seriously deteriorated between T1 and T2, a "loss spiral" might have occurred (cf. Hobfoll, 1988, 1989), and the health effects might have lasted longer. Results of a study among *employees* at low risk for financial problems (Aldwin & Revenson, 1986) also indicated that the severity of financial problems makes a difference. Although that study used a relatively short time-lag (one year), health complaints turned out to be stronger predictors of financial problems than financial problems were of health complaints.

Our findings have interesting theoretical implications for stress-research in general. Most importantly, they show that the bi-directional nature of the relationship between stressors and strains cannot be neglected, especially in the long run and in cases where the incidence and magnitude of stressors is rather small. Furthermore, the fact that the results differ from the outcomes of studies with a shorter time lag emphasizes that stress-researchers should be aware of the effect of the time frame used in their study (see also Baily & Baghat, 1987; Kessler, 1987).

This study has a number of limitations. Firstly, the long time lag, which is the strength of this study, is also its weakness. Our design with two time points spaced over a ten-year time-period is inadequate to study the short-term dynamics of the stress-process. Future studies would benefit from using more measurement moments with shorter time-intervals, which would provide more insight into the waxing and waning of stressors and strains over time. Using at least three measurement moments would also make it possible to test a dynamic equilibrium model (Heady & Wearing, 1989; Ormel & Schaufeli,

1991). Secondly, our model contained only a limited number of variables. To gain more detailed insight into the dynamics of this model, it might be fruitful to add variables we have discussed earlier. Examples are personality characteristics or other personal resources that may clarify the effect of health complaints on the financial situation, such as managerial qualities (cf. Wright et al., 1993). Including variables related to interaction processes between spouses would also be interesting (cf. Vinokur et al., 1996).

Thirdly, our power was limited to the number of *couples* (i.e., $N = 91$). Using a small sample in SEM increases the risk of not detecting relationships that are actually present in the population (Kaplan, 1996). Therefore, it would be advisable to test the model in a larger population in order to test the generality of our findings.

Finally, this study addressed a specific sub-sample of the self-employed, namely Dutch dairy farm couples, who had been doing relatively well up to the time of data-collection (Landbouw Economisch Instituut, 1996). Therefore, this study has likely captured chronic conditions rather than acute events. Future studies may benefit from including self-employed couples facing more serious financial hardship. Furthermore, it is unclear to what extent our findings could be generalized to *female* business-operators and their partners.

In spite of its limitations, this study has unique features that provide valuable insights into the relationship between financial problems and health complaints. It reveals the long-term perspective, which generally remains hidden, and it does so for a poorly researched group, namely self-employed couples. This does not only have theoretical implications, but practical relevance as well. Our findings emphasize the importance of husbands' health as a resource for both the family and the business, in a setting where the husband is primarily responsible for the business. Professionals assisting the self-employed during hard times should therefore not discard health complaints as mere stress-outcomes, focusing only on solving the financial problems and

helping the self-employed to deal with financial adversity. The relationship between health and financial problems works both ways, and improving health may additionally help counteract financial problems, as well as preventing the self-employed person from encountering financial problems in the future. Special attention should be paid to the self-employed person's wife, considering the fact that financial problems are likely more to affect her in a different way than her husband. The results of this study suggest that she may be influenced through social processes. For this reason, actions aimed at helping self-employed couples cope with financial problems should also direct their attention to the interaction processes between spouses.

CHAPTER 4

OBJECTIVE BUSINESS PROSPECTS AND FARMERS' WELL-BEING: RECIPROCAL EFFECTS TESTED IN A 3-WAVE LONGITUDINAL STUDY[6]

During the past decades, political and societal developments, such as changing policies of the European Community, growing global competition, and increasing consumer demands concerning both the quality of agricultural products and the production process, threatened the continuity of many farm-business by increasing production costs and decreasing returns on agricultural products (Landbouw Economisch Instituut, 2000). Additionally, the farming community in Europe has been facing calamities such as floods, diseases in crops, and animal diseases (BSE, pigs flue, foot and mouth disease). These are among the most important reasons why the number of European farmers (agriculturalists and horticulturalists) has steadily declined. Between 1990 and 1997, the number of classified holdings in the European Union decreased with 19% from 8,582,900 to 6,954,300 (Gordon, 2000). Agriculture in the Netherlands followed the same trends (Landbouw Economisch Instituut, 2000). For instance, between 1990 and 1999, the number of farms decreased with 9.7 % from 112,498 to 101,545. Moreover, the percentage of farm closures has increased from 1.8 % between 1990 and 1994 to 3.2 % between 1998 and 1999. Additionally, since 1990, many Dutch farm families were confronted with financial hardship. For instance, between 1993 and 1997, almost 40 % of the

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[6] Gorgievski-Duijvesteijn, M.J., Bakker, A.B., Van der Veen, H.B., Giesen, C.W.M., Schaufeli, W.B. (submitted) Objective business prospects and farmers' well-being, reciprocal effects tested in a three wave longitudinal study.

farmers derived incomes from farming below the poverty line (Van Everdingen, et al., 1999).

The farm-crises have triggered several studies among the farming population, for instance, because it was thought to underlie increased suicide rates among the farming population (Gallagher & Sheehy, 1994; Malmberg, et al., 1997). However, still little is known about the personal consequences of facing a poor objective financial perspective for continuation of the farm business. The current three-wave longitudinal study among Dutch farmers (agriculturists and horticulturists) aims at filling this gap. Based on a motivational stress theory, Conservation of Resources (COR) theory (Hobfoll, 1988; 2001), a process model will be developed relating the objective financial perspective for continuation of the farm business to farmers' mental health and their intention to quit the business.

The Research Model

The central question in this study is to what extent a poor objective financial perspective for continuation of the farm impinges on farmers' subjective experience of financial stress and stress-outcomes (Figure 4.1). In line with contemporary stress approaches (Cox & Griffiths, 1995; Frese & Zapf, 1994), objective stressors are considered antecedents in the stress process, which are expected to lead to the subjective experience of stress, which in turn predicts stress-outcomes. This so-called stress-perception model is displayed in Figure 4.1. Additionally, over time, reversed causal effects are expected to occur.

Previous farm studies have shown ample evidence relating subjectively experienced financial problems at the farm to impaired mental and physical well-being, such as lower overall satisfaction (Duncan, et al., 1988; Eberhardt & Pooyan, 1990), mental and physical health complaints (Eberhardt & Pooyan, 1990; Giesen, 1991; Gorgievski-Duijvesteijn, 1999; Welles & Defares, 1983),

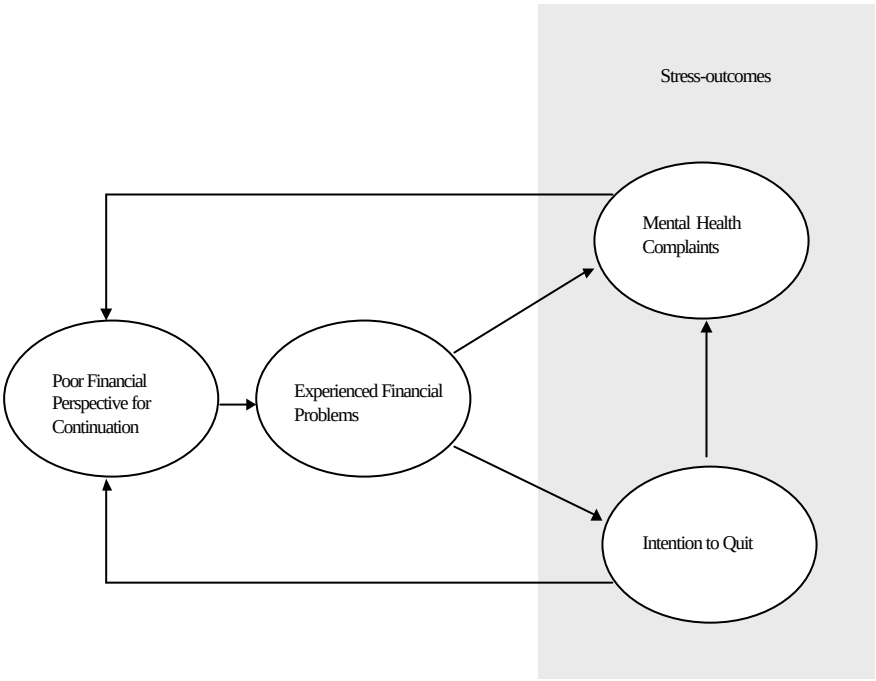

Figure 4.1. *The conceptual research model*

and distress (Schulman & Armstrong, 1989). In contrast, studies using objective financial indicators generally showed *no* such relationships. For instance, debt to asset and debt to gross sales ratios were unrelated to mental and physical health complaints in studies by Keating (1988) and Welles and Defares (1983). Furthermore, debt-load was found not to relate to mental health complaints (Cary & Weston, 1978; Welles & Defares, 1983) or physical health complaints (Welles & Defares, 1983). More closely related to the farmers' private domain, low gross income predicted psychological distress in only one study by Schulman and Armstrong (1989). In other studies, income was unrelated to depression (Cary & Weston, 1978; Swisher, et al., 1998), anxiety (Cary &

Weston, 1978), negative affect (Swisher et al, 1998) or wellbeing (Duncan, et al., 1988).

It may now be tempting to conclude that the objective financial situation of the business does not have personal consequences. Additionally, one may wonder to what extent experienced financial problems were anchored in the objective financial situation, since most studies using self-reports of financial problems did not provide information on how they related to objective financial indicators. So far, only two farm studies have incorporated both objective economic indicators, namely family income and the ratio of debts to assets, and experienced economic pressure, such as not being able to make ends meet (Armstrong & Schulman, 1990; Lorenz, et al., 1993). Although the designs of these studies did not allow for firm conclusions concerning causality of the effects, both studies did find that a poor objective financial situation led to subjectively experienced hardship, which in turn predicted depressive symptoms. These results merit further investigation. Experienced financial hardship may be conditional for poor objective finances to predict impaired health and motivation.

Our study will extend the knowledge derived from previous farm stress research, by testing an integrated, structural equation model including both causal *and* reversed causal relationships between the objective financial situation of the farm, experienced financial problems and stress outcomes. Additionally, we have tried to avoid some of the methodological pitfalls and deficiencies of previous farm studies. First, causality of the relationships is made plausible, by using a three-wave longitudinal design, controlling for stability of the objective financial situation, experienced financial problems and stress-outcomes. Second, we paid special attention to the validity of the measure of the objective financial situation.

The Financial Perspective for Continuation of the Farm

Incorporating economic indicators into a psychological study is no trivial pursuit. The first question that needs to be answered is which indicator would make sense. Our study will primarily focus on the financial perspective for continuation of the farm, which means whether a farmer will have sufficient financial means to continue his or her business with the same operational characteristics, including size, location and business activities. As will be explained in more detail later, we expect a poor financial business perspective to be psychologically relevant, because it relates to future job insecurity, which previous studies have shown to be very stressful (e.g., Hartley, Jacobson, Klandermans & Van Vuuren, 1991). Moreover, since most farms in The Netherlands are family businesses, in which the work and private domain are closely intertwined, a poor financial business perspective is also related to the inability to fulfill family needs (Gasson & Errington, 1993).

Economists have proposed several indicators based on the farm's accountancy data that could give insight into the financial prospects of the business (Mulder, 1994). Traditionally, these are financial ratios indicating profitability, liquidity or solvency of the farm. Examples are the ratio of debt to total asset indicating solvency and net cash flow indicating liquidity. However, according to Mulder (1994), the main disadvantages of these ratios are that, like the indicators used in previous stress-studies, they only represent a small, incomplete picture of the financial situation. Moreover, the rules for evaluating whether they indicate good or poor business prospects were generally derived empirically and on an ad-hoc basis, not taking into account expectations for future developments of the farm and its environment. Consequently, the financial ratios poorly predicted the actual financial prospects for the future of the business (Mulder, 1994).

In contrast, our study will calculate the financial perspective for continuation of the farm using the Financial Economic Simulation (FES)-

model (Mulder, 1994, 1996) that is based on economic organization theory (Hendrikse & Schreuder, 1990; Panzar & Rosse, 1984). This theory regards the farm-business as a coalition of actors, being the farm-family, the bank, suppliers and the national government, each of which have their own (financial) interest in the business. If the interest of any of these actors is being threatened, the continuity of the business is threatened. This is most clearly illustrated for the bank. The bank is primarily expected to aim at providing the farmer with a maximum debt capital to continue and develop the farm. However, this is limited by the creditworthiness of the farmer. If a farmer does not meet the requirements of the bank, such as the capacity to pay yearly interests and redemption, he or she will not be able to obtain additional loans and will not have sufficient financial means to develop the business as planned. In the worst case, banks may even demand immediate repayment of current loans and the business may go bankrupt.

In practice, the FES-model takes the current financial characteristics of the business as a starting point, which are reflected in respectively the flow of funds statement and the balance sheet (see Figure 4.2). Then, based on a simulation of possible yearly events concerning farm income (e.g., the price of agricultural products) and expenditures (e.g., tax payments, wages for workers, investments) the farms' financial characteristics in the subsequent year are calculated.

Subsequently, to indicate the financial perspective for continuation of the business, the model estimates whether a farmer will be able to meet all financial requirements at the short, middle and long term (Mulder, 1996; Mulder, et al., 1999). In the short term, continuation of the business is threatened by *liquidity* problems. A business has liquidity-problems when the total sum of family and business expenditures and tax and interest payments exceeds the income derived from product-sales, off-farm income and available liquid means. In that case, the farmer will be unable to meet short-term

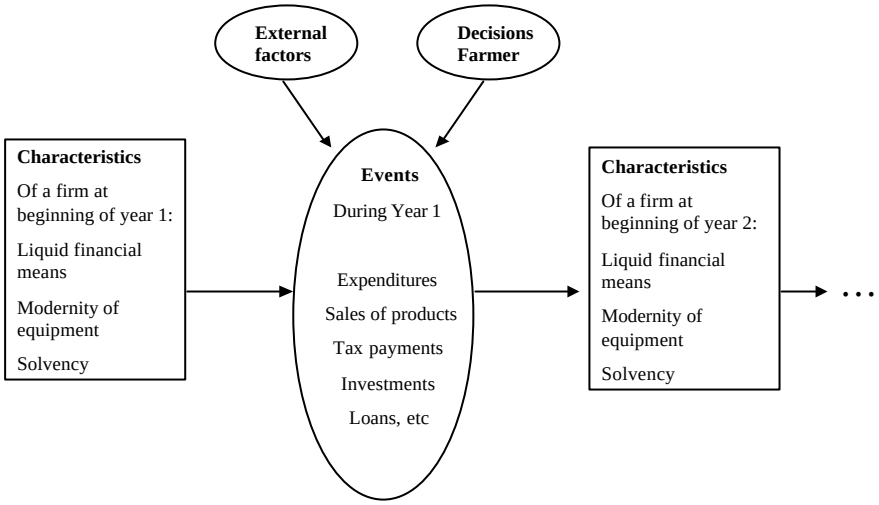

Figure 4.2. *The financial economic simulation (FES) - model (Mulder, 1996)*

financial requirements, such as paying suppliers. For continuation in the middle term, sufficient liquidity to finance the daily routine is not enough. A farmer should *additionally* be able to finance investments that are necessary to maintain or improve the farm's competitive position from a technical, economic or societal point of view. An indication of a good perspective for continuation in the middle term is the *modernity of the durable assets*, which can be defined as the ratio of economic value to replacement value. Finally, in the long term, on top of good liquidity and modernity, the financial situation needs to be sufficient to finance take-over. To this end, the farm needs to have *sufficient solvency*, which is the ratio of own capital and borrowed capital.

In validation studies of the simulation model (e.g., Mulder, 1994; 1996), the annually estimated developments on the individual farms closely matched the real annual developments during the estimation period. Best results were obtained concerning solvency: for 98 % of businesses solvency estimates were correct. Results were least satisfactory for liquid financial means and modernity

of buildings, for which estimates were acceptable in 74% of the cases. At the branch level, annual predictions concerning the number of farm closures matched observed developments well, for instance, for fruit growing (Baltussen & Van der Veen, 1999) and horticulture under glass (Landbouw Economisch Instituut-Dienst Landbouwkundig Onderzoek, Proefstation Bloemisterij en Glasgroenten & Centrum voor Landbouw en Milieu, 1998).

Objective Financial Business Perspective Versus Experienced Financial Problems

To what extent are the financial problems farmers experience rooted in a poor *objective* financial perspective for continuation? Given the fact that, from an economic point of view, the objective financial perspective for continuation of the farm predicts real developments of individual businesses and agricultural branches, one might expect this to an important extent to be the case. Therefore, we hypothesize that the objective financial perspective for continuation of the farm is predictive of the financial problems farmers experience (*Hypothesis 1*).

Our design has several features promoting the congruency between the objective financial perspective for continuation of the business and experienced financial problems. First, in their position as self-employed, farmers can be considered to know their own financial situation. Moreover, the farmers in our sample all participated in the farm accountancy data network (FADN), as a consequence of which technical administrative employees of the Agricultural Economics Research Institute had done their booking and had given them feedback concerning their financial position a few months before the subjective data were collected. Second, in the current study, in order to prevent discrepancy caused by unreliable reporting, wording of the items asking farmers about their financial position was kept as factual as possible, so that answering them would require a minimum of emotional or cognitive processes (Frese &

Zapf, 1994). Finally, data were analyzed using latent factor modeling, which allowed us to correct for measurement errors (Frese & Zapf, 1994).

Psychological Consequences of a Poor Financial Perspective for Continuation

Based on COR-theory (Hobfoll, 1988; 2001), we predict that a poor or deteriorating objective financial perspective for continuation of the business will have negative personal consequences for the individual farmer. According to COR-theory, people strive to build, protect and retain their resources. Resources are those objects, personal characteristics, social circumstances, energies and conditions that are valued and sought after, and aid the requirement of other resources. When investment of resources does not lead to the expected gain, or when someone is confronted with (potential) resource loss, this is expected to lead to negative emotions (e.g., frustration, anger, fear, or depression), which would eventually deteriorate health.

More specifically, we predict that a poor or deteriorating financial perspective for continuation of the farm impairs farmers' mental health (*Hypothesis 2*), because this perspective and the aspects it is comprised of are important resources in several ways. First, financial aspects such as the modernity of durable assets and capital may have intrinsic value, or they may be appreciated because they represent something else which is valued, such as security and status (Hobfoll, 1988). Second, liquidity, modernity and solvency also have important exchange value, being important resources for running the farm and fulfilling family needs (Gasson & Errington, 1993).

When confronted with problems concerning the financial perspective for continuation of the business, farmers are expected to make efforts to solve them. COR-theory predicts that small adjustments will be made first, i.e. those resources will be invested which are easily replenished, promise the highest probability of success and the smallest probability of further resource loss. Theoretically, farm families have several options to prevent or solve financial

problems, most important of which are also incorporated into the FES-model. Liquidity problems are expected to have first priority (Mulder, 1994; 1996). Farmers could initially try to adjust by, for instance, investing a few hours working off-farm, obtaining new, short-term loans, demanding suspension of payment, or by postponing small maintenance investments. If financial problems are short-lived, as soon as the problems have been solved, the distress related to it is expected to decrease. After they have been resolved, short-lived financial problems may even have a positive effect on well-being, by replenishing other resources, such as confidence in internal strength or social networks (see also Aneshensel, 1996).

However, if financial problems persist or worsen over a longer period of time, farmers may get trapped in a so-called "loss-spiral" (Hobfoll, 1988): more and more important resources may be invested or lost, resulting in a depletion of resources and consequently in increased mental health problems. For instance, previous studies have shown that it is quite common for farmers to use their family's financial resources to solve financial problems at the farm, by cutting down family expenditures (e.g., Mulder, 1994; Rosenblatt, 1990), thus causing financial problems to cross over into the private domain (Gorgievski-Duijvesteijn, Giesen & Bakker, 2000). Furthermore, farmers may have to sell essential means of production, such as stocks and other assets, which in turn impairs the productivity of the farm.

A farmer's actual possibilities to make use of the different strategies to solve financial problems are bounded. For instance, cutting down family expenditures can only be done as long as family income does not fall below the subsistence level. If a poor financial perspective for continuation leads to total depletion of resources, farm-closure may become inevitable. In practice, boundaries have proven to be stretchy and farmers manage to stay in farming even if, technically speaking, they no longer have the ability to adjust to the farm's financial problems (Mulder, 1996). Nevertheless, we predict that,

eventually, farmers will decide that the price for continuing the business becomes too high and, in addition to impaired health, a poor or deteriorating financial perspective will lead to the intention to quit farming (*Hypothesis 3*).

Additionally, the threat of having to quit the farm is expected to be very stressful. It would not only mean losing valued property, but also the most important source of income and farming as a way of life. According to COR-theory, losing a societal role is one of the most severe losses. Not surprisingly, then, foreclosure of the farm has been found to have a great impact on the mental and physical health of the farmers concerned (Rosenblatt, 1990). We therefore hypothesize that a higher intention to quit the business will lead to higher emotional distress (*Hypothesis 4*).

Long-term Financial Consequences of Withdrawal and Deteriorated Health

Finally, building on COR-theory, it can be theorized that, in the long run, poor health and the intention to quit the business may also have repercussions on the financial perspective for continuation of the business. In farming, where the family provides most of the labor and is primarily responsible for all management decisions (see Gasson & Errington, 1993), the farmer and the farm family can be assumed to have a substantial influence on business productivity and hence on its finances. Motivation and good mental health may be important resources for doing so. Therefore, poor mental health (*Hypothesis 5*) and a higher intention to quit (*Hypothesis 6*) are expected to lead to a poor objective financial perspective for continuation of the farm.

Indications for such a so-called reversed causation, in which health outcomes predict financial problems instead of the other way around, have been observed in previous research (Gorgievski-Duijvesteijn et al., 2000). In this study among Dutch dairy farm couples, farmers' health was predictive of the financial problems they and their spouses experienced ten years later. Similar results have been found in longitudinal studies among other

occupations. For instance, studies among educated middle class employees (Aldwin & Revenson, 1986) and among skilled blue-collar workers (Glickman, et al., 1991), showed that individuals with poor mental health were more likely to experience financial hardship, and were less likely to recover from it than those with better mental health. Concerning the intention to quit the business, a recent study has indeed shown that farmers who intended to quit were less likely to invest in their business, which reduced their financial perspective (Van der Veen, Van Bommel & Venema, 2000).

Method

Participants and Procedure

A total of 688 farmers and horticulturists, participating in the Farm Accountancy Data Network (FADN) of the Landbouw Economisch Instituut (LEI - Agricultural Economics Research Institute), were asked to fill in questionnaires on farm stress in the spring of 1998, 1999 and 2000. A total of 513 respondents participated: 493 (72 %) responded in the first wave, 405 (59 %) in the second wave and 361 (52 %) in the third wave. The FADN is representative of 94 % of the Dutch agricultural and horticultural production (Van Dijk, Groot, Lodder & Vrolijk, 1998). Very small and very large farms are not represented in the sample: only farms between 16 and 800 European Size Units[7] (ESU) are the field of observation. Furthermore, the farms that were asked to participate were a selection of typical family businesses: only those farms where the farmer was the only owner-operator, or where the farmer had a partnership with either his or her spouse or offspring were included. The reason to exclude farms with more than one owner not belonging to the same

[7] European Size Units (ESU) are defined as units gross standard balance (GSB) corrected for price developments in Europe (LEI, 2000). ESU are calculated by dividing the GSB by a norm factor specified by the EC. ESU allow a comparison of the size of businesses operating in different branches. For example, in 1996 1 ESU was about 1.32 milking cows or 2.41 ha. of potato's.

family is that we expected other processes to play a role that were not the subject of study, in particular group-dynamic processes.

The LEI calculated the objective financial perspective for continuation of the individual farms in 1998, 1999 and 2000 based on the farms' accountancy data (Mulder 1996). These data were collected one month (agriculture) to four months (horticulture) before the stress-survey. Calculations were possible for 474 of the 513 farms in 1998, 463 farms in 1999 and 409 farms in 2000. For 398 farms, accountancy data were complete, and for 27 farms, some accountancy data were missing at all three measurement moments.

Participants were mainly male: 484 men and 29 women. In 1998, they were between 21 and 65 years of age, with an average of 44 years (SD = 9.71). Mean farm-size was 114 ESU (SD = 78). Very small farms (less than 50 ESU) were slightly underrepresented, whereas large farms (over 80 ESU) were slightly over-represented. This was because in 1998 the response-rate was somewhat higher amongst glasshouse horticulturists, who tend to have larger businesses than other farmers. At 14 % of all farms the farmer worked alone, at 37 % of the farms the farm-couple worked together, at 30 % of the farms children participated as well, and 18 % of the farms also employed other family members, for example the farmer's parents or siblings. Additionally, 29 % of the farms employed non-family members.

Farmers who did not participate in our study did *not* differ significantly from those who did with respect to business-features such as their size, number of people working at the business and branch. Furthermore, farmers participating in all three data-waves (N = 314) did *not* differ significantly from those who dropped out (N = 199) concerning business-features (size, number of hours worked at the farm, financial situation), family-features (family size, youngest child's age) and the farmer's personal variables (age, mental and physical health). Dropouts were included in the analyses, using missing value analyses (see below). Most non-responders and dropouts did not give any

specific reason for not responding. Only 5 % of dropout was caused by respondents leaving the population (N = 36): 17 farmers no longer participated in the FADN and were therefore not asked to participate again, 12 farmers had stopped farming and 7 farmers had moved to farm abroad.

Measures

The *Objective Financial Perspective for Continuation of the Farm* was calculated for each individual farm by means of a micro-simulation model for discrete events (Mulder, 1994). This model calculated the farms liquid means, modernity and solvency, which could be either sufficient or insufficient compared to a certain threshold, which is fixed annually for each farm branch (Mulder et al., 1996). Subsequently, each farmer was assigned a score depending on their objective financial situation, namely: (1) 'The farmer is not expected to meet any liquidity problems. He or she has been able to do all replacement-investments and will also be able to do them in the future. Moreover, the farmer has good solvency'; (2) 'The farmer is not expected to meet any liquidity problems. He or she has been able to do all replacement-investments and will also be able to do them in the future. However, the farmer's solvency is not so well'; (3) 'The farmer is not expected to meet any liquidity problems. However, he or she does have problems keeping the business modern. He or she has not been able to do all replacement-investments and is also expecting problems with doing them in the future. (4) 'The farmer is expected to meet liquidity problems in the near future that he or she is able to solve by him/herself by asking extra short-term loans, adjusting farm or family expenditures, or asking extension of payments'; and (5) The farmer is expected to meet liquidity problems in the near future that he or she is not able to solve by him/herself'.

Experienced Financial Problems were measured with an 8-item scale, comprised of five items from Giesen (1991) and three items based on Mulder (1994). Examples are "Lately, how often has it occurred you did not have

enough money to make ends meet?" and "Lately, how often has it occurred you had to work with worn-out machinery because you lacked financial means to replace them?" Answers ranged from 1 "never or rarely" to 5 "very often". The internal consistency of the scale was good: Cronbach's alpha was .84 in 1998, .87 in 1999 and .85 in 2000.

Mental Health Complaints were measured with a 12-item version of the General Health Questionnaire (GHQ; Goldberg, 1972). Respondents were asked to indicate the extent to which they had experienced certain mental health complaints the past few weeks, for example: "Lately, have you been able to concentrate on the things you were doing?" Answers were scored on a four-point scale, the formulation of which matched the content of the item, for instance answers to the question "Lately, have you felt that you were a worthless person?" was 1 "not at all" to 4 "much more than usual". Reliability (Cronbach's alpha) of the scale was .86 in each of the three waves.

Intention to quit the business was measured by asking respondents to indicate the likelihood that the next five years they would: "gradually cut down the business" or to "close the business, for instance by selling it". Answers ranged from 1 'very unlikely' to 4 'very likely'. Reliability (KR20) of the scale was .79 in 1998, .80 in 1999 and .78 in 2000. To externally validate the intention measure, logistic regression analyses were performed, showing that the intention to quit in 1998 and 1999 both significantly predicted actual dropout caused by quitting (N = 17). For the intention to quit in 1998, R = .38, B = 1.31, *S.E.* = .31, $p < .001$ and for the intention to quit in 1999, R = .28, B = .99, *S.E.* = .33, $p < .005$.

Strategy of Analyses

In addition to descriptive analyses, latent factor structural equations modeling was performed with the AMOS program to test the hypotheses (Arbuckle, 1995). Missing values were corrected for, using the Full Information

Maximum Likelihood Method (Arbuckle, 1995). We corrected for measurement error in the self-report measures by using two separate indicators for the latent variables 'experienced financial problems', 'mental health complaints' and 'intention to quit the business'. To this end, the scales measuring these variables were split randomly into two halves. Since only one observed variable indicated the objective financial perspective for continuation, unreliability of this variable could not be corrected for.

The raw scores of experienced financial problems and mental health complaints were left-skewed. Therefore, prior to the SEM analyses, we performed a natural logarithmic transformation on these two scales. This led to acceptable skewness and kurtosis of the indicators, which were all below 1.5 (cf. Dunn, et al., 1994).

In order to test a possible effect of a deteriorating in addition to a stable poor financial situation, paths were added from the financial perspective for continuation of the business and experienced financial problems in a previous point in time (t-1) to health complaints and the intention to quit at time t, in addition to the effect of a poor objective financial perspective for continuation of the business and experienced financial problems at time t (cf. Saris, 2001). An example is Equation 1, representing the effect of experienced financial problems on mental health complaints:

$$MHC_{t2} = a*FP_{t2} + b*FP_{t1} + \varepsilon_{MHC.} \qquad (1)$$

where ε_{MHC} is the error-term of mental health complaints. If b = - a, path a can be interpreted as the B-value of the difference score:

$$MHC_{t2} = a*FP_{t2} - a*FP_{t1} + \varepsilon_{MHC} = a*(FP_{t2} - FP_{t1}) + \varepsilon_{MHC.} \qquad (1a)$$

If positive, an increase in financial problems between T1 and T2 relates to more mental health complaints at time T2. However, since we do not expect *only a change* in the financial situation to predict the dependent variables, we did not constrain the magnitude of the effects to be equal, by reparameterizing a in (1) as $a_1 + a_2$, with $a_2 = - b$. In an equation:

$$MHC_{t2} = a_1 * FP_{t2} + a_2 * \Delta FP + \varepsilon_{MHC} \quad (1b)$$

To examine how closely competing models fitted to the data, we calculated the three most important fit indices as advised by Hu and Bentler (1999). First was the traditional goodness of fit index Chi-square likelihood ratio ($\chi 2$). In addition, we used two fit indices that counteract problems associated with the $\chi 2$, such as the influence of sample size. Those indices were the Bonnet non-normed fit index (NNFI), and the root mean square error of approximation (RMSEA). The NNFI should be larger than .95 and the RMSEA should be below .05. Since the time-interval between T1 and T2 equaled the time-interval between T2 and T3, for reasons of parsimony, all identical relationships were constrained to be equal across measurement moments. This did not significantly affect the $\chi 2$.

Results

Descriptive Analyses

Means, standard deviations and correlation coefficients of the observed variables are shown in Table 4.1. The mean scores show prospects for the farm businesses have declined during the study. At the third wave of data-collection, the objective financial perspective for continuation was significantly poorer than at the first two data-waves, namely 2.76 (*SD* = 1.20), compared to 2.54 (*SD* = 1.28) at the first and 2.51 (*SD* = 1.16) at the second wave, $F_{(2)} = 12.42$, $p < .001$. Interestingly, farmers *experienced* more financial problems in *both* the second and the third wave, compared to the first wave. Scores on the non-transformed 8-item scale increased slightly from 1.66 (*SD* = .65) in 1998 to 1.75 (*SD* = .70) in 1999 and 1.76 (*SD* = .69) in 2000, $F_{(2)} = 8.99$, $p < .001$. Additionally, the intention to quit the business also increased over the years. Scores for the intention to gradually cut down the business increased from 1.47 (*SD* = .73) at the first wave to 1.59 (*SD* = .76) at the second and 1.62 (*SD* =

Table 4.1. *Means, standard deviations and correlation coefficients between the raw variables, N = 513 farmers*

			Time 1							Time 2							Time 3					
	M	*SD*	1	2	3	4	5	6	7	1	2	3	4	5	6	7	1	2	3	4	5	6
Time 1																						
1. [1)]	2.54	1.32	-																			
2.	.69	.37	.29**	-																		
3.	.23	.33	.29**	.69**	-																	
4.	1.47	.74	.08	.04	.14**	-																
5.	1.43	.71	.04	.06	.13**	.66**	-															
6.	.64	.19	.06	.20**	.23**	.06	.09	-														
7.	.55	.20	.05	.24**	.25**	.04	.09	.72**	-													
Time 2																						
1.	2.51	1.21	.46**	.20**	.22**	.19**	.16**	.06	.10*	-												
2.	.74	.36	.27**	.66**	.53**	.08	.09	.23**	.17**	.24**	-											
3.	.28	.38	.33**	.49**	.63**	.12*	.12*	.24**	.19**	.27**	.69**	-										
4.	1.59	.81	.11**	.10*	.15**	.61**	.41**	.08	.13**	.17**	.16**	.18**	-									
5.	1.54	.81	.14**	.09	.14**	.45**	.51**	.06	.08	.19**	.17**	.19**	.67**	-								
6.	.64	.19	.11*	.18**	.21**	.02	.07	.44**	.33**	.12*	.28**	.36**	.12*	.14**	-							
7.	.56	.21	.08	.10*	.18**	.07	.07	.37**	.42**	.11*	.23**	.34**	.10*	.15**	.68**	-						
Time 3																						
1.	2.76	1.31	.40**	.21**	.22**	.11*	.10*	.12*	.14*	.48**	.27*	.30**	.13**	.14**	.09	.12**	-					
2.	.74	.38	.23**	.57**	.45**	-.01	.05	.29*	.22*	.19**	.71**	.59**	-.02	.01	.39**	.31**	.32**	-				
3.	.27	.37	.24**	.41**	.55**	.09	.10*	.33*	.32*	.22**	.53**	.72**	.05	.05	.34**	.30**	.34**	.67**	-			
4.	1.63	.90	.18**	.03	.12*	.57**	.37*	.14*	.19*	.20**	.13**	.20**	.62**	.53**	.10*	.18**	.15**	.03	.13**	-		
5.	1.65	.89	.14**	.06	.14**	.49**	.57*	.13*	.12*	.24**	.15**	.21**	.51**	.66**	.14**	.17**	.18**	.07	.16**	.65**	-	
6.	.63	.19	.04	.11*	.10*	.00	.10*	.50*	.39*	.02	.21**	.19**	.08	.06	.44**	.38**	.07	.28**	.32**	.11*	.15**	-
7.	.58	.20	.03	.06	.13**	.03	.10*	.42*	.44*	-.02	.15**	.16**	.10*	.14**	.32**	.43**	.06	.22**	.27**	.13**	.19**	.69**

* $p < .05$, ** $p < .01$

1) 1. Objective financial perspective for continuation
2. Experienced financial problems, 1st indicator
3. Experienced financial problems, 2nd indicator
4. Intention to gradually cut down the farm business
5. Intention to quit in the short term, for instance by selling
6. Mental health complaints, 1st indicator
7. Mental health complaints, 2nd indicator

.82) at the third wave, $F_{(2)} = 16.28$, $p < .001$. The intention to quit the farm in the short-term increased from 1.43 ($SD = .69$) at the first wave to 1.54 ($SD = .75$) at the second and 1.65 ($SD = .82$) at the third wave, $F_{(2)} = 29.39$, $p < .001$. The number of mental health complaints did not change significantly over time.

Testing the Hypothesized Model

As recommended by Jöreskog and Sörbom (1993), we tested our hypotheses following a stepwise procedure. Prior to testing the hypothesized structural relationships, we fitted a measurement model to obtain an optimal basis for further analyses. The measurement model included the twelve latent variables for objective financial perspective for continuation, experienced financial problems, intention to quit, and mental health complaints at all three measurement moments; the 21 indicators of these latent variables; and paths leading from the latent variables to the indicators. Furthermore, the model contained covariances between all latent variables and between significantly related error-terms of identical indicators over time. These were the three error-terms of respectively the first indicators measuring experienced financial problems, the intention to gradually cut down the business and the second indicators measuring mental health complaints. The rationale behind correlating these error-terms is that identical measures are likely to be related over time because of systematic error that is not of theoretical interest, such as response bias (Fergusson & Horwood, 1988). This measurement model fitted the data well, $\chi^2_{(120)} = 129.33$, $p = .26$, CFI = 1.00, NNFI = 1.00, RMSEA = .01, meaning it was a good basis for model testing. Table 4.2 shows the correlation coefficients between the latent variables.

Subsequently, we fitted the hypothesized model. In addition to the hypothesized relationships, this model also contained correlations between the variables at T1 and stability of the variables over time. Stability was modeled as follows.

Table 4.2. *Correlation coefficients between the latent variables, N = 513*

	1	2	3	4	5	6	7	8	9	10	11
Time 1											
1. Objective financial perspective	-										
2. Experienced financial problems	.33**	-									
3. Intention to quit the farm	.06	.15**	-								
4. Mental health problems	.07	.31**	.07	-							
Time 2											
5. Objective financial perspective	.46**	.25**	.20**	.07	-						
6. Experienced financial problems	.35**	.73**	.15**	.28**	.30**	-					
7. Intention to quit the farm	.15**	.17**	.64**	.09	.21**	.24**	-				
8. Mental health problems	.12*	.24**	.07	.51**	.13*	.43**	.18**	-			
Time 3											
9. Objective financial perspective	.40**	.25**	.12*	.13*	.48**	.32**	.16**	.11	-		
10. Experienced financial problems	.27**	.64**	.10	.40**	.24**	.84**	.04	.47**	.38**	-	
11. Intention to quit the farm	.17**	.16**	.68**	.17**	.26**	.26**	.78**	.19**	.19**	.17**	-
12. Mental health problems	.05	.13*	.08	.59**	.01	.24**	.13*	.53**	.08	.36**	.21**

* $p < .05$, ** $p < .01$

Stability of the objective financial perspective for continuation, experienced financial problems, and intention to quit were represented by autoregressions, assuming that problems in one year predispose a person to experiencing further problems in the subsequent years. In addition to paths leading from T1 to T2 scores and between T2 and T3 scores, we also modeled the paths between T1 and T3 scores, taking into account the possibility that problems or intentions may fluctuate, occur at T1, be absent at T2, and recur again at T3. Only for experienced financial problems this turned out *not* to be the case and therefore the path leading from experienced financial problems at T1 to experienced financial problems at T3 was removed.

Concerning mental health complaints, previous research has shown that stability is better represented in another way. Stability in mental health complaints may to an important extent be due to internal, homeostatic

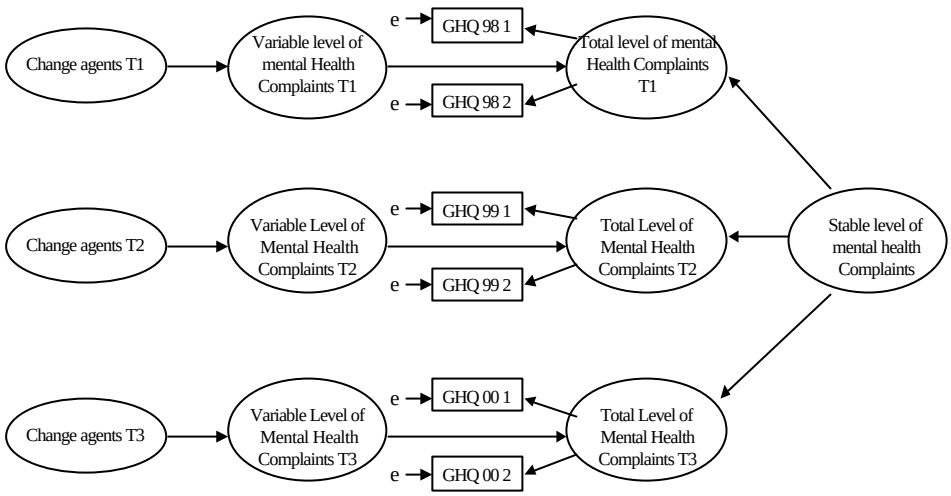

Figure 4.3. *The stability and change model for mental health complaints (cf. Duncan Jones et al., 1990)*

processes, causing levels of health complaints to stay at a stable, characteristic baseline level (see Duncan-Jones, et al., 1990; Ormel & Schaufeli, 1991). This characteristic baseline can be considered a person's constitution, which, by definition, cannot be influenced by temporary, external change agents. Since these homeostatic processes may suppress a possible influence of the financial situation and the intention to quit, we decided to model stability of mental health complaints using the so-called "stability and change model" (cf. Duncan-Jones et al., 1990), which divides the levels of mental health complaints into one factor representing the stable level of complaints over time and three factors representing the variable levels of complaints at T1, T2 and T3 (see Figure 4.3). The "stability and change" model of mental health complaints fitted our data well, $\chi^2_{(6)} = 2.14$, $p = .91$, NNFI = 1.00, RMSEA = 0.00. At T1,

the stable level explained 56 % of variance in total level of mental health complaints, at T2 45 % and at T3 55 %, thus leaving only between 45 % and 55 % of variance to be explained by external change agents. For our data, the variable levels of mental health complaints turned out *not* to be significantly related over time.

An additional advantage of fitting a stability and change model for mental health complaints is that it allows us to predict the objective financial perspective for continuation, experienced financial problems and intention to quit, by the stable level of mental health complaints. Previous studies have shown this stable level to be strongly related to personality treats, such as neuroticism and negative affectivity (Duncan-Jones et al., 1990; Ormel & Schaufeli, 1991). Since self-reports may be contaminated with answering tendencies caused by these personality traits, predicting self-reports from the stable level of mental health complaints is a way to control for these tendencies. On the other hand, people with a poorer stable mental health condition might also actually face poorer objective financial perspectives for continuation of their farms, because they may be less effective in building up and protecting their resources.

Within measurement moments, analyses showed the following results (see Figure 4.4). In line with *Hypothesis 1*, a poor objective financial perspective for continuation did predict experienced financial problems at each measurement moment. Separate cross-sectional analyses showed that the objective financial perspective for continuation explained 8 % of variance in experienced financial problems at T1, 10 % at T2 and 17 % at T3. Subsequently, supporting *Hypothesis 2*, higher levels of experienced financial problems related to increased mental health complaints. Additionally, as predicted with *Hypothesis 3*, the more financial problems farmers experienced, the higher the intention to quit the business.

Including developments over time showed that the mental health effect of experienced financial problems was to an important extent, but not entirely, due to a *change* in experienced financial problems compared to the year before. Namely, allowing experienced financial problems at one point in time (e.g. T1) to predict mental health complaints one year later (e.g. T2), produced a negative path coefficient (i.e. -.26), whose magnitude was almost equal to the positive, simultaneous path coefficient leading from experienced financial problems to mental health complaints in that subsequent year (in our example T2). Remember that .48 is the beta of both the simultaneous effect and the effect of the difference score. Constraining the magnitude of both relationships to be equal, but with opposite signs, significantly deteriorated the fit, $\Delta\chi^2_{(1)} = 4.32$, $p < .05$, indicating that both the current level and a changing level of experienced financial problems played a role. No effect was found of an increased number of experienced financial problems compared to two years before. Intention to quit the business, on the other hand, was *not* predicted by an increase in experienced financial problems on top of currently experienced levels of financial problems.

To test our contention that experienced financial problems mediate a possible relationship between the objective financial perspective for continuation and stress-outcomes in more detail, we fitted a model that did not include experienced financial problems. If in this model, direct paths between the objective financial perspective for continuation and stress-outcomes are not significant, it would be incorrect to speak of experienced financial problems as mediators. In that case, experienced financial problems would be conditional for the objective financial perspective for continuation to lead to stress-outcomes. Supporting the mediation-model, both paths turned out to be significant, namely for mental health complaints $\beta = .10$, $Z = 2.06$, $p < .05$ and for intention to quit, $\beta = .10$, $Z = 3.02$, $p < .01$. Moreover, as the final model (Figure 4.4) shows, including experienced financial problems into the model

rendered these direct paths insignificant. Interestingly, in contrast to the effect of experienced financial problems, no significant effects were found of a *changing* objective perspective for continuation on mental health complaints on top of the current situation. Note that, in line with *Hypothesis 4*, intention to quit the business led to an increased number of mental health complaints within measurement moments. Additionally, no long-term effect was found.

Concerning possible negative long-term effects of stress-outcomes on the objective financial situation (*Hypotheses 5 and 6*) only partial support was found. Farmers' intention to quit their business at one point in time predicted a poorer *objective* financial perspective for continuation of the farm business a year later for both time lags (*Hypothesis 6*). This means that the intention to quit the business tended to consolidate throughout time, since a deteriorated objective financial perspective for continuation in turn reinforced the intention to quit. Furthermore, in addition to a direct deteriorating mental health effect in the short run, the intention to quit might also indirectly impair mental health in the long run, through a deteriorating objective financial perspective for continuation. Contrary to the expectations, variable mental health complaints did *not* predict the objective financial perspective for continuation over time (*Hypothesis 5*).

Finally, to test whether stable higher levels of mental health complaints negatively influenced either subjective experience or objective business prospects, paths were modeled leading from the stable level of mental health complaints to the other variables in the study. Results showed that the stable level of mental health complaints only predicted experienced financial problems directly. In other words, farmers with poorer stable levels of mental health experienced more financial problems than farmers with a better stable mental health condition, over and above the actual financial perspective for continuation.

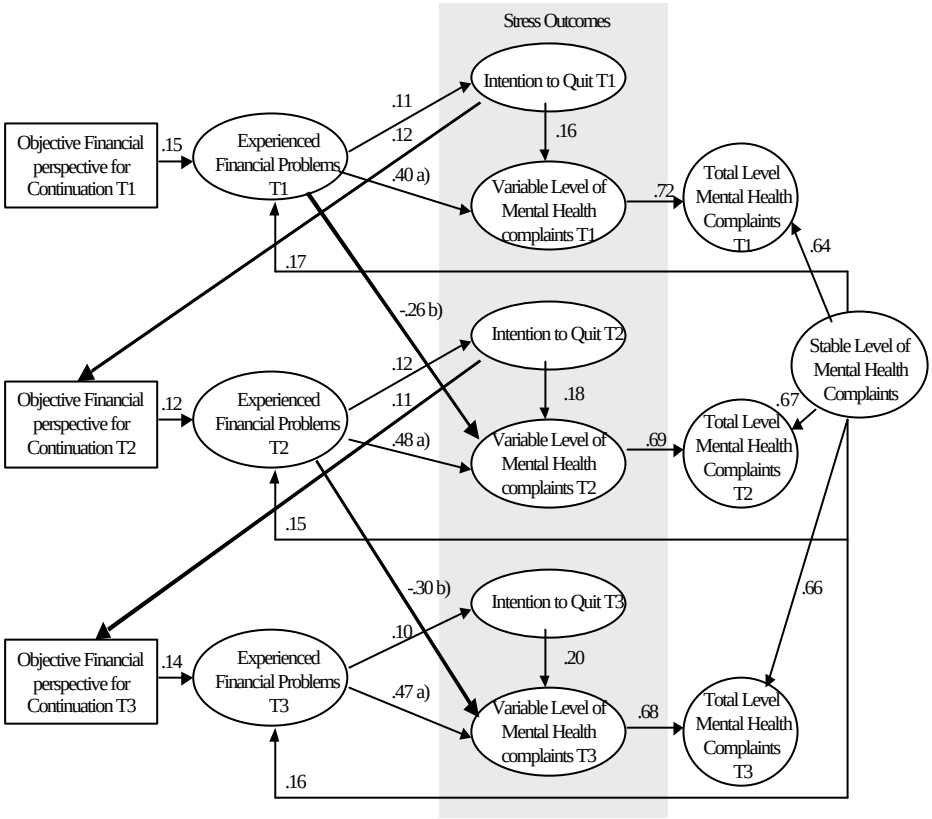

Figure 4.4. *Final model: personal consequences of a poor objective financial perspective for continuation of the farm-business.* $c^{2}_{(167)} = 201.38$, $p = .04$, $CFI = 1.00$, $NNFI = 1.00$, $RMSEA = .02$. $N=513$

Note: The model also includes autoregression coefficients for the objective financial business perspective, experienced financial problems and intention to quit. In the non-standardized solution, identical paths are constrained to be equal over time.

a) This β includes also the β of the difference score

b) This β is the negative β of the difference score and should be interpreted in combination with a)

Conclusions and Discussion

On the basis of COR-theory (Hobfoll, 1988; 2001), the current study tested attitudinal and mental health consequences of continuing the farm business in spite of a poor objective financial perspective for continuation. Additionally, it investigated possible reversed causal effects over time. Structural equation analyses suggest a downward spiral. As proposed, a poor objective financial perspective for continuation evoked experienced financial problems (*Hypothesis 1*). Subsequently, experienced financial problems impaired farmers' mental health (*Hypothesis 2*). This effect was to an important extent due to an increase in experienced financial problems compared to the year before. This supports the COR-theoretical premise that *resource loss*, rather than a stable low level of resources predicts distress (Hobfoll, 2001).

Furthermore, in line with our predictions, experienced financial problems also decreased farmers' motivation to continue their business (*Hypothesis 3*), which even further deteriorated their mental health condition (*Hypothesis 4*). Concerning the intention to quit farming, only persistently higher levels of experienced financial problems over time were significant predictors and not changes in experienced financial problems, indicating that the intention to quit farming may be based on a structural poor financial situation.

Our answer to the question as to whether objective business prospects affect farmers' well-being is in the affirmative. First, the objective financial perspective for continuation explained between 8 and 17 % of variance in experienced financial problems. Although this may seem modest, given the fact that the objective financial perspective was assessed by means of an independent, objective data-source, it is somewhat stronger than what we expected on the basis of previous studies. For instance, it is comparable to results obtained in farm studies using farmers' *self-reports* of their objective financial situation, showing that convergence between debt-to-asset ratio and

experienced financial problems ranged from $r = .18$ (Armstrong & Schulman, 1990) to $r = .44$ (Lorenz et al. 1993).

Second, a poor objective financial perspective for continuation did predict poorer mental health and a higher intention to quit. However, experienced financial problems turned out to be more important. Even though the convergence between the objective financial perspective and experienced financial problems was not very strong, experienced financial problems did turn out to be the active ingredient, fully mediating the relationship between the objective financial perspective and stress-outcomes. This means that farmers with a poor objective financial perspective for continuation had higher intentions to quit their business and more mental health complaints, *because* they experienced more financial problems.

Interestingly, in contrast to increased experienced financial problems, a *deteriorating objective* financial perspective did *not* predict mental health complaints on top of a stable poor financial perspective. This may prove the "primacy of loss" principle (Hobfoll, 2001) to be invalid. However, we favor another explanation. Namely, we believe this outcome may be the result of a latency effect. Recent changes in the objective financial situation may go unnoticed for a while, as farmers may respond with highly automated forms of coping which do not produce distress (cf. Frese, 1986). A typical example is working longer hours on the farm (Hillebrand, Van den Hoek & Spierings, 1995). Only if the objective financial perspective persists to be poor over a longer period of time, may farmers consciously start reallocating their resources in an attempt to cope (cf. Frese, 1986), for instance, by postponing maintenance investments and adjusting family expenses. In our study this would be manifested by *increased* experienced financial problems. Indeed, further exploration of our data showed that farmers whose objective short-term perspective for continuation had been good during the first two waves of data collection, but had turned poor at the third data-wave *experienced* significantly *less* financial problems than farmers who,

at the third data wave, had had poor objective short-term perspectives for more than a year (M = 1.95, SD = 0.73 compared to M = 2.37, SD = 1.00, $F_{(95)}$ = 2.37, $p < .05$).

For a reversed causal relationship over time, leading from attitudinal and mental health consequences to the objective financial business perspective, only partial support was found. In line with previous results (Van der Veen, et al., 2000), the intention to quit the farm business at one point in time predicted a poorer objective financial perspective for continuation in the following year for both time lags (*Hypothesis 6*). This agrees with results of stress-studies among other occupations, for instance general practitioners, showing that withdrawal in the long-term led to a deterioration of their stressful situation (Bakker, Schaufeli, Sixma, Bosveld & Van Dierendonck, 2000). This may be so because farmers who intent to quit decrease their material and immaterial investments. According to some authors (e.g., Lee & Ashford, 1993), withdrawal, particularly (emotionally) distancing from the job, would have a positive effect on mental health by relieving the tension related to facing job-stressors, such as financial problems. Our results do not show evidence for such a positive effect of the intention to quit. However, to test this proposition conclusively, moderator analyses need to be performed.

At this point we want to note that even though our study shows the intention to quit the business is stressful, we do consider quitting a legitimate decision when facing poor financial prospects. Moreover, when anticipating actual farm-closure, it may be sensible not to invest too much in the business anymore, since all these investments may eventually be lost, thus increasing the negative emotional consequences of quitting (cf. Hobfoll, 1988, 1989, 2001). As a qualitative study showed (Rosenblatt, 1990), farmers who hang on to the business in spite of poor and declining financial prospects are eventually far worse off, if in spite of all their efforts they are unable to ward off farm-closure.

Contrary to our expectations (*Hypothesis 5*), increased mental health problems *that were the result* of external change agents did *not* impair the objective financial perspective over time. This contradicts the so-called "principle of cumulative causation" (Myrdal, 1962) recently emphasized by other authors (e.g. Aldwin & Revenson, 1986; Gorgievski-Duijvesteijn, et al., 2000; Taris, et al., 1998), according to which decreased mental health *that is the result* of experiencing stress would render a person even more vulnerable for experiencing further exposure to stressors. In contrast, our results provided stronger support for a static vulnerability explanation. Namely, farmers with lower stable mental health levels were more negative about their experienced financial situation at each measurement moment. Eventually, this may become a self-fulfilling prophecy, as experienced financial problems predict a stronger intention to quit farming, which has a negative impact on the objective financial situation.

As for theoretical implications, our results argue in favor of investigating the separate contribution of both objective stressors and subjective experience, especially in longitudinal research. To date, much has yet remained unknown about how features of the objective environment translate into stressors. As this study shows, people's reaction to objective stressors and subjective experience may show a different course in time.

Second, using a "stability and change" model of mental health complaints (cf. Duncan-Jones et al., 1990) to control for homeostatic processes potentially masking stress-effects proved to be very useful. Based on correlation coefficients between total levels of mental health complaints and the objective financial perspective (Table 4.1), we might erroneously have concluded they were unrelated. In addition, using a stability and change model of mental health turned out to be an elegant way of gaining insight into the role of a stable poor mental health condition in the stress process. By the way, our results did not show farmers with a poor stable mental health condition just had global

negative answering tendencies that artificially deflated relationships between self-report measures, but rather that it played a substantive role in the stress process (cf. Spector, Zapf, Chen, Frese, 2000). Namely, people with poor stable levels of mental health complaints were more negative about their situation, which in turn affected their intentions and emotions.

Study Limitations

Our study had several shortcomings. First, our measure of the objective financial perspective for continuation was not very fine grained. Based on dichotomous indicators of liquidity, modernity and solvency, it did, for instance, not take the severity of objective liquidity problems into account. This might be an alternative explanation for not finding a mental health effect of a changing objective perspective. Additionally, our study did not provide insight into possible differential effects of the separate indicators, or interaction effects between them that may have deflated the relationships between the objective financial perspective for continuation and distress, such as the possibility that liquidity problems weigh heavier when solvency is poor.

Second, given the low convergence between the objective financial perspective and experienced financial problems, the question arises to what extent experienced financial problems are rooted in reality, or exist only in farmers' minds. A previous farm study showed spouses agreed to an important extent on the severity of experienced financial problems (Gorgievski-Duijvesteijn et al., 2000), indicating they do exist beyond farmers' individual experience. In this respect, it might be interesting to investigate what causes farmers to experience financial problems in addition to the objective financial business perspective, for instance family needs or family income (cf. George & Brief, 1990).

Third, future research might benefit from including mediating variables explaining how experienced financial problems lead to impaired mental health.

From a COR theoretical perspective, one would obviously focus on whether experiencing financial problems leads to loss of other resources. An example is loss of personal control, which has been found to mediate the relationship between experienced financial problems and depression to an important extent (Armstrong & Schulman, 1990; Lorenz et al. 1993).

Finally, it would also be interesting to focus on consequences of a poor financial perspective for continuation of the farm for other family members, as they may not respond to financial problems in the same way the farmer does. For instance, whereas loss of personal resources was found to be an important explaining variable for men, negative *social* consequences were found to weigh heavier for wives in studies by Giesen (1991), Gorgievski-Duijvesteijn et al. (2000) and Lorenz et al. (1993).

Practical Implications

As for practical implications, we revealed an interesting part of the stress process among a poorly researched group, namely self-employed individuals operating in a branch faced with declining objective financial prospects. An increasing number of farmers will be confronted with the stress-inducing question whether it might be better to quit. As this study shows, farmers base their decisions on the financial problems they experience, which often only marginally relate to the objective financial perspective for continuation of their farm. Our results emphasize that farmers need to be made aware of their actual objective financial prospects.

Most importantly, farmers who are unduly pessimistic about their financial prospects unnecessarily experience emotional distress and decreased motivation. In the long run, their negative expectations about their business prospects may even become a self-fulfilling prophecy, through decreased investments. On the other hand, if the objective financial perspective is indeed poor, farmers timely need to realize that continuing the business may lead to a

depletion of resources, and they need to consider whether they want to continue under such conditions. Particularly if the objective financial situation is so poor that foreclosure of the farm is inevitable, it is important to quit timely, so that sufficient resources will be left to make a new start outside farming.

CHAPTER 5

FINANCES AND FARMERS' HEALTH: A DYNAMIC EQUILIBRIUM MODEL OF RESOURCES[8]

"We were two half farmers that together did not make a whole one". With these words a farmer described her situation before she and her husband decided to quit their farm business. For five years they had kept their dairy farm running in spite of her husband's progressing rheumatoid arthritis and her own asthmatic complaints, but eventually it had become too much of a burden. As her husband said: "I quit because it hurts to see my farm fall into disrepair".

People posses a variety of resources to meet the demands of their lives and, as this example shows, among the most pervasive ones is without any doubt a person's own well-being. Poor mental and physical health may seriously impair a person's functioning. However, to what extent this will be the case depends on a person's vulnerability. Another couple having other resources that could compensate for the abovementioned health problems might not decide to quit farming at all. Imagine a farm couple with a successor, who might actually work on the farm or apply for a loan to renovate the business.

According to Hobfoll (1989), "resources are the single unit necessary for understanding stress" (p. 516). Although this may be overstated, understanding resources may add to our insight in the stress process. In the current three-wave longitudinal study we therefore aimed at unraveling the interplay between two important resources, namely farmers' finances and

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[8] Gorgievski-Duijvsteijn, M.J., Bakker, A.B., Schaufeli, W.B., Van der Heijden, P.G.M. (Submitted). Finances and Farmers' Health: A Dynamic Equilibrium Model of Resources.

health. Specifically, a three-wave design allows us to examine the extent to which finances and health have stable characteristic levels, which are not under the influence of external events, versus variable levels that may be influenced. Furthermore, in the light of stability versus variability of finances and health, we will investigate short and long term causal and reversed causal effects of financial problems and health.

Theoretical Background

According to conservation of resources (COR) theory (Hobfoll, 1988, 1989, 2001) people strive to expand, protect or retain their resources. Resources are those objects, conditions, personal characteristics and energies that may have intrinsic value, or that may help the individual acquire other resources. A male dairy farmer, for instance, may have those object resources most people in western society have, such as a house and a car, but also specific job-related ones like machinery, stables, land and cattle. One important condition for him is probably "being a farmer", but he may also be a spouse, a parent or a member of the local soccer team. Furthermore, he may have personal resources such as a stable personality, good social and professional skills, and a solid social network. Finally, the farmer's energies include time, money and knowledge. COR theory predicts that, when confronted with an opportunity to achieve resources, or with a (potential) loss of resources, people will be motivated to obtain, maintain or retain these resources by investing other resources they possess. The dairy farmer, for instance, may need to renovate his stable and decides to invest additional money in order to buy a high quality floor that is easy to clean. He might reason that this investment will save him time in the future and prevent the outbreak of animal diseases.

If investments do not lead to the expected outcome, COR theory predicts that individuals will experience psychological distress – typically depressed mood, anxiety or anger – and they may even develop serious health

problems, such as burnout and heart diseases (Hobfoll, 1990, 2001). Thus, like other stress frameworks such as the transactional stress approach (Lazarus & Folkman, 1984) and the person-environment fit model (French & Kaplan, 1972), COR-theory primarily considers impaired health is primarily a possible outcome of the stress process. However, unlike most stress models, COR-theory emphasizes that stress will occur *only* when total resource levels *change* (Hobfoll, 2000). In other words, it is more dynamic than other theories.

Financial Problems Predict Health Complaints

Following COR-theory, we hypothesize that financial problems will cause distress and, consequently, lead to impaired health (*Hypothesis 1*), because financial means are important resources in several ways. First, capital is an "object resource" (Hobfoll, 1988, 1989), which has intrinsic value or is appreciated because it represents something else which is valued, such as security or status. Second, money can be considered an “energy”, a resource that has important instrumental value. For farmers, this relates to the specific characteristics of a traditional farm family-business. Financial resources are a necessary means to run the farm and financial problems may hamper business activities. Furthermore, work and home are closely intertwined, which means farm-income should also cover the costs of family living. Thus, if farm-income is insufficient, financial problems may additionally impair the fulfillment of a farmer’s personal and family needs (Gasson & Errington, 1993; Mulder, 1996). Additionally, financial problems may transfer into the private domain when farmers decide to invest resources from their private budget to compensate for financial problems at the business, for instance by adjusting family expenses to invest the money thus saved in new machinery. Previous research has shown that such an entanglement of work and family life to be fairly common among farmers (e.g., Leistritz, et al., 1987; Rosenblatt, 1990).

In sum, farmers' financial situation may affect many aspects of their lives and, consequently, financial problems are expected to have a great impact on their mental and physical well-being. Indeed, many farm-studies have related a decrease in income level and more enduring financial hardship to impaired mental and physical health. However, since most of these studies employed cross-sectional designs (e.g. Berkowitz & Perkins, 1985; Duncan, et al., 1988; Hertsgaard & Light, 1984; Keating, 1988; Schubert-Walker & Walker, 1988; Schulman & Armstrong, 1989; Weigel, et al., 1987; Welles & Defares, 1983), they do not provide insight into the direction or causality of the relationship between health and finances.

Several predictions can be made concerning the effect of poor finances on health, depending on time frame and course of the financial situation. First, when a farmer faces a (potential) loss of financial resources, an immediate mental (cognitive and affective) and physical reaction is expected to occur which mobilizes or motivates the farmer to deal with it. For instance, in the short term, financial problems may lead to mild mental health complaints such as negative mood, anxiety, hostility or irritability. Short-term physical complaints might be related to the acute responses of the autonomic nervous system or endocrine changes following a particular emotional response, such as palpitations, flushing, trembling or stomach complaints (Lovallo, 1997). Furthermore, short-term stress may be related to the occurrence of illnesses with a short onset in susceptible individuals, like migraine attacks (Kohler & Haimerl, 1990) or respiratory illness (Neale & Stone, 1989). COR theory would predict that farmers would then start with investing less important or easily obtainable resources (Hobfoll, 1988, 1989). For instance, one of the family members may invest a few hours and start to work off-farm. Additionally, small renovations may be postponed, which reduces the value of the business. If financial problems are being solved this way within the near future, the short-term distress related to it is expected to decrease. After they have been

resolved, short-term financial problems might even have a positive health effect by replenishing other resources, in particular confidence in internal strength or social networks (see also Aneshensel, 1996; Updegraf & Tailor, 2000).

However, when financial problems persist over a longer period of time, farmers may get trapped in a so-called "loss-spiral" (Hobfoll, 1988, 1989, 2001): More and more important resources may be invested or lost, resulting in a depletion of other resources and consequently in increased strain. For example, essential means of production may have to be sold, such as land or cattle. Eventually, this may lead to foreclosure of the business. This would not only mean losing valued property, but also losing the most important source of income, one's identity as a farmer and farming as a way of life. Indeed, losing the farm has a great impact on the emotional and physical health of the farmers concerned and has, for instance, been related to depression and suicidal attempts in a qualitative study by Rosenblatt (1990) and increased suicide rates in rural areas in epidemiological research (Galagher & Sheehy, 1994; Malmberg, et al., 1997).

Up till now, only a few longitudinal farm studies have been conducted which investigated the effect of poor finances on health over time. In addition, results of these studies were inconclusive. In one longitudinal research project among about 80 farm and 300 non-farm rural families in Iowa, poor finances were predictive of husbands' and wives' health complaints over time (Lorenz, et al., 1993; Swischer, Elder, Lorenz & Conger, 1998). More specifically, economic pressure, having trouble making ends meet and making economic adjustments in one year were found to predict depression two years later (Lorenz et al., 1993). In another article based on the same study, Swischer et al. (1998) controlled for stability in the outcome measures, and showed that financial and job-related negative events predicted an *increase* in depressive symptoms and a *decline* in positive affect over a one-year time period. Unfortunately, Gorgievski-Duijvesteijn, et al. (2000) could not replicate this finding in their ten-year

follow-up study among 94 Dutch dairy farm-couples. They found no evidence for a relationship from liquidity problems to mental and physical health complaints over time, after correcting for stability of mental and physical health.

One explanation for the differences between the two studies might be that possible short-term effects may have remained undetected in the ten-year follow-up study. Another plausible explanation could be sampling differences. Whereas the Dutch dairy farmers had operated under financially favorable conditions during the time of data collection, the Iowa farmers had faced a farm-crisis. As the authors reported (Swischer et al., 1998), the farm-crisis had made financial issues of "over-riding concern" to the Iowa farmers. They argue that this also explained why, in their study, financial issues were stronger predictors of affective complaints for farmers than for non-farmers. The outcomes of the current study may provide evidence in favor of such a sampling difference. Using a three-wave full panel design, we will investigate whether in particular *unusual* financial problems influence health.

Poor Health Predicts Financial Problems

So far, we described how financial problems might cause health complaints, but on the basis of COR-theory (Hobfoll, 1988,1989), one may argue that the reverse is possible as well. Providing most of the labor themselves and being primarily responsible for all management decisions, farmers can be assumed to have a substantial influence on the farm's productivity and hence on their financial situation (see Gasson & Errington, 1993). A good mental and physical health condition may be considered an important resource for doing so. Farmers' health is therefore expected to have a positive impact on their finances (*Hypothesis 2*).

There is indeed some evidence for a reversed causal relationship leading from farmers' health complaints to financial problems. Gorgievski-

Duijvesteijn et al. (2000) found direct evidence for such a relationship by showing that farmers' mental and physical health complaints predicted farm *couples'* financial problems ten years later. Conceptually similar results have been found in longitudinal studies in other occupations, for instance, among educated middle class employees (Aldwin & Revenson, 1986) and among skilled blue-collar workers (Glickman, et al., 1991). Results of these studies showed that individuals with poor mental health were more likely to experience financial hardship and were less likely to recover from it compared to those with better mental health. In addition, other studies have provided some indirect evidence. One study among human service supervisory personnel (Wright, Bonett & Sweeney, 1993) showed that poor mental health impaired management qualities, such as goal emphasis, team building and work facilitation. Health problems have also been found to precede the occurrence of job-stressors (Zapf, et al., 1996), indicating that employees with poor health may be less able to positively influence their work environment.

Based on a comparison of the outcomes of different studies, several authors (e.g., Aldwin & Revenson, 1986; Gorgievski-Duijvesteijn et al., 2000) have suggested that health complaints may be stronger predictors of financial problems than vice versa, in case the financial situation is rather good and people are at low risk of experiencing financial problems. However, to our knowledge, no studies have ever tested this assertion, or theorized why this might be the case. The current study aims at filling this void.

Stability versus Variability of Resources

In order to understand the bi-directional relationship between finances and health, it is important to have insight into the stability and variability of financial resources and health (see Figure 5.1). Change agents, such as sudden financial demands associated with increased production costs or physical demands related to adverse physical working conditions, may cause changes in

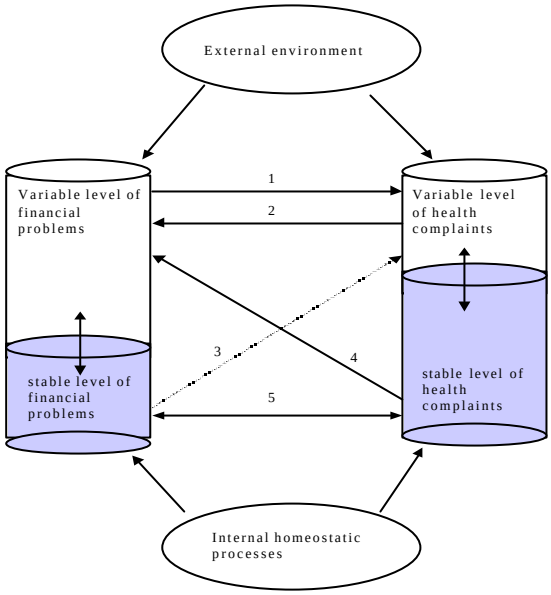

Figure 5.1. *Conceptual dynamic equilibrium model of finances and health*

levels of financial resources and health. However, these disruptions are expected to be rather short-lived, as internal, adaptive processes, so-called homeostatic processes, are expected to cause resource levels to return to a characteristic stable baseline or vulnerability level, even if the objective situation has changed permanently. This is in accordance with the dynamic equilibrium model of Heady and Wearing (1989, see also Duncan-Jones, et al. 1990; Ormel & Schaufeli, 1991).

Following COR-theory (Hobfoll, 1988, 1989), adaptive attempts to restore certain resource levels would be the investment of other resources. Through these investments, change agents primarily depleting one resource, for instance finances, may indirectly lead to the depletion of other resources, such as health. Other researchers (Duncan-Jones et al, 1990; Heady & Wearing, 1989; Ormel & Schaufeli, 1991; Ormel & Wohlfahrt, 1991) exclusively identified personality characteristics, such as neuroticism, extraversion and

openness to experience, as the key variables in maintaining stable levels of, for instance, mental health complaints and exposure to life events, such as long-term unemployment.

The stronger the internal processes operating to maintain stable, characteristic levels, the smaller the potential influence of change agents and consequently the smaller the variable resource levels. Concerning financial resources and health, little is known about the extent to which they differ with respect to the magnitude of their stable and variable levels. Generally, stable levels have been shown to explain about two thirds of the variance in health complaints (Ormel & Schaufeli, 1991). Our study is the first to explore the extent to which farmers experience stable, characteristic levels of financial problems as well. Finances are expected to be less stable than health (*Hypothesis 3*). This may especially be the case for liquid financial means, which can be considered as "energy", a resource with important exchange value. When confronted with external demands, people are expected to invest their energies more readily than other resources they posses (Hobfoll, 1989). Furthermore, liquid financial means are generally used up when invested, whereas this is normally not the case for health. Therefore, external events are expected to influence finances more strongly than health.

What does this mean for possible causal and reversed causal relationships between finances and health (Arrows 1 to 4 in Figure 5.1)? We hypothesize that the potential effect of finances (total effect of Arrows 1 and 3) on the *variable* level of health complaints will be stronger than the effect of finances on the total level of health complaints not distinguishing between variable and stable levels (*Hypothesis 1a*). An example may illuminate this contention. Suppose we find that financial problems explain about 5 % of the variance in mental health complaints. We may conclude that this effect is rather modest. However, if additionally we found that 70 % of the variance in mental health complaints is stable, the maximum expected effect of all external

influences together, including the lack of financial resources, is 30 %. Considering this, the relative effect of financial problems compared to the effect of other external influences is rather substantial, namely 16.7 %. Similarly, we predict that the effect of health complaints on the *variable* level of financial problems (Arrows 2 and 4) will be stronger than the effect of health complaints on the total level of financial problems (*Hypothesis 2a*). Note that, since we expect homeostatic processes not to be so strong for finances, the stable level of financial problems is expected not to be so large, and hence the difference between the relative effects of health complaints on the total versus the variable level of financial problems is expected to be small.

A Stable Situation Suppresses the Effect of Financial Problems on Health Complaints

In addition to our contention that homeostatic processes will be stronger for health than for finances, there is yet another difference between these two resources. Specifically, we expect two different mechanisms to underlie the causal versus the reversed causal relationships between health and finances, which are differentially affected by stability of the environment. Concerning the effect of financial problems on health complaints, the underlying mechanism is assumed to be the *stress-mechanism* of conserving ones resources well elaborated on in COR-theory, that we would like to refer to as a direct stress-chain. In this direct stress-chain, *change* plays a central role. In particular, a net *loss* of resources, real or anticipated, is expected to cause distress and ill health, not a *stable* poor situation. So, even in case of chronic lack of financial resources, the only thing that counts is the (anticipated) *loss* of other resources invested to solve financial problems or to compensate for a lack of money. This means that even enduring financial hardship needs not necessarily lead to impaired health, if it is not accompanied by resource loss of some kind!

In terms of the dynamic equilibrium model, it is expected that when financial problems are at a person's stable, characteristic level, he or she will not feel very distressed by them, or will be motivated to solve them by investing other resources. Consequently, only the variable level of financial problems is expected to affect the variable level of health complaints (Arrow 1 in Figure 5.1) and not the stable level of financial problems (Arrow 3). This is the second adjustment of Hypothesis 1, *Hypothesis 1b*. The implication is that the more financial problems individuals face on top of their stable level of financial problems, the more health complaints they are expected to experience (temporarily) on top of their stable base-line levels of health complaints.

Empirical evidence for these assumptions is fragmented. First, one sophisticated study on well-being provided some indirect evidence. Using a three-wave design, Saris (2001) showed that Russian employees who received high incomes were not more satisfied than employees who received less. Only employees whose income had recently increased were more satisfied than others. Income *change* is typically a part of the variable resource level. For German employees, most of whom did not experience income changes, the analyses lacked power and the results remained insignificant.

Second, empirical reviews on subjective well-being (Cummins, 2000) have shown that variability in satisfaction is larger among samples facing chronic conditions posing a burden to the individual, such as unemployment or spinal injury, than among the general population. This suggests that for individuals facing chronic conditions, satisfaction had larger variable levels. Additionally, positive objective living conditions, such as functional independence and mobility, contacts with siblings or income status, were stronger predictors of satisfaction among samples facing chronic problems than among the population at large.

Finally, one study that did divide levels of health complaints into a stable and variable levels showed that among a sample of mothers of school-

aged children thought to experience many (negative) environmental changes, variable levels were larger than among samples experiencing few environmental changes (Duncan-Jones et al., 1990). For mothers of school aged children, variable levels explained about 40 percent of variance in health complaints, compared to 33 percent among other populations. Unfortunately, whether this variability in health coincided with a stronger relationship between negative experiences and health complaints was not studied.

The design of the current study is particularly suited to investigate the effect of financial problems on health complaints. Most importantly, this study examines a large group of Dutch self-employed persons running a farm business, which is currently facing many developments that potentially threaten their financial situation (Landbouw Economisch Instituut, 2000). A substantial percentage of them is therefore expected to experience negative financial changes and a power problem is not likely to occur. Additionally, because of the utilization of a three-wave design, it is possible to investigate whether *variability* of the financial situation rather than stable poor finances influences health (see Hypothesis 1b). This will be done in two ways. First, like previous studies, we will test whether actual changes in financial problems over time influence health, rather than a financial situation that does not change. Second, the level of financial problems will be split up into a stable and a variable level. The variable level of financial problems is more than actual change, because variable resource levels may also show a certain degree of stability caused by the time it may take for (stable) resource levels to be restored after a disruption (Ormel & Schaufeli, 1991). Subsequently, it will be tested whether the variable level rather than the stable level of financial problems influences health. To our knowledge this is the first study doing so.

A Stable Situation does not Suppress the Effect of Health on Finances

Based on COR-theory (Hobfoll, 1988, 1989), we expect the same stress-mechanism to explain the effect of ill health on finances. Certain external influences might primarily affect health rather than finances, such as health hazards related to working with pesticides. As illness may render an individual incapable of working or confront him or her with medical costs, loss of physical functions may affect the financial situation (Arrow 2 in Figure 5.1). This is also an example of a direct stress-chain. Loss of physical health and the strain it puts on other resources is expected to be stressful and may also affect mental health.

However, besides this stress-mechanism, yet another mechanism may explain why health influences finances. Namely, health as a permanent, personal resource may constantly help people to build up other resources and buffer against resource loss caused by external threats. Day in day out, farmers with better health might be able to get more work done at the farm. Therefore, a stable good health condition is expected to relate to a better stable financial situation (Arrow 5, Figure 5.1). Additionally, as healthier farmers might also be better able to use opportunities in their favor or to deal with risks and negative experiences, a stable good health condition is expected to be a protective factor against negative influences of the external environment (Arrow 4, Figure 5.1). So, not only a *deteriorating* health condition, but also a *chronic* poor health condition may influence the financial situation. For the majority of farmers, this constant influence of their chronic baseline health condition is expected to be more important than the possible influence of a sudden illness, say an accidental flue. However, perhaps needless to say, the former is not expected to be more stressful. So, in contrast to Hypothesis 1b, which stated that the stable level of financial problems does *not* affect health, *Hypothesis 2b* states that the *stable* level rather than the variable level of health complaints influences both the stable and variable level of financial problems.

Overview

In sum, the current study aims to expand conservation of resources (COR) theory (Hobfoll, 1988; 2001), by postulating a dynamic equilibrium model of resources (cf. Heady & Wearing, 1989). We hypothesized that all resources have stable levels, but that external events may cause fluctuations in these stable resource levels, as expressed in a variable level. These fluctuations are expected to be temporary, since internal homeostatic processes will cause resource levels to return to their stable baselines. In the light of stability and variability of finances and health, we examined their bi-directional relationship in both the short- and long-term.

Using a three wave longitudinal design, we will first test the hypotheses that financial problems have a positive effect on mental and physical health complaints (Hypothesis 1) and vice versa, that mental and physical health complaints have a positive impact on financial problems (Hypothesis 2). Additionally, we will investigate the extent to which finances and health are stable. We predict that the stable level of financial problems is smaller than the stable level of mental and physical health complaints (Hypothesis 3). Then, taking into account stability and variability of finances and health, hypotheses 1 and 2 are qualified. We expect that financial problems will influence the variable levels of mental and physical health complaints more strongly than their total levels, which include both the stable and variable level (Hypothesis 1a). Likewise, poor mental and physical health will more strongly predict the variable level than the total level of financial problems (Hypothesis 2a). Second, we argue that actual *changes* in financial problems, or *variable* levels of financial problems influence health, rather than low stable levels of financial resources (Hypothesis 1b). In addition, concerning the negative effect of poor health on finances, a stable poor health condition is expected to influence finances rather than short-lived health complaints (Hypothesis 2b).

Most stress-studies using multiple health outcomes do not explicitly address the relationship between them. However, mental and physical health are expected to relate strongly to each other. They may be correlated because they are influenced by common factors, such as stressors, life style behaviors or underlying illnesses (Bernard & Krupat, 1994; Goldberg, 1989; Ottoson, 1989). Furthermore, mental health complaints may affect physical health through physiological responses (Lovallo, 1997) and being physically ill may influence mental health, for instance, because it is experienced as stressful (Ottoson, 1989). Since the relationship between mental and physical health may also contain information relevant to the relationship between finances and health, we decided to test a possible bi-directional relationship between mental and physical health analogous to the way we tested the bi-directional relationship between finances and health.

Method

Participants and Procedure

A total of 688 Dutch farmers and horticulturists, participating in the Farm Accountancy Data Network (FADN) of the Agricultural Economics Research Institute (Landbouw Economisch Instituut), were asked to fill out questionnaires on farm well being during spring 1998, 1999 and 2000. A total of 513 respondents participated: 493 (72 %) responded in the first wave, 405 (59 %) in the second wave and 361 (52 %) in the third wave. The FADN is itself a sample, representing 94 % of the Dutch agricultural and horticultural production (Dijk, et al., 1998). Very small and very large farms are not represented in the sample: only farms between 16 and 800 European Size Units[9] (ESU) are the field of observation. Furthermore, the farms that were

[9] European Size Units (ESU) is defined as units gross standard balance (GSB) corrected for price-developments in Europe. ESU are calculated by dividing the GSB by a norm factor specified by the EC. ESU allow comparison of the size of businesses

asked to participate were a selection of typical family businesses: only those farms where the farmer was the only owner-operator, or where the farmer had a partnership with either his or her spouse or offspring were included. The reason to exclude farms with more than one owner not belonging to the same family is that we expected other processes to play a role that were not the subject of study, in particular group-dynamic processes.

Participants were mostly male: 473 men and 29 women. They were between 21 and 65 years of age, with an average of 44 years in 1998 (*SD*=9.71). Mean farm-size of the sample was 114 ESU (*SD*=78). Very small farms (less than 50 ESU) were slightly underrepresented, whereas large farms (over 80 ESU) were slightly over-represented. This was because in 1998 the response-rate was somewhat higher amongst glasshouse horticulturists, who tend to have larger businesses than other farmers. At 14 % of all farms the farmer worked alone, at 37 % of the farms the farmer and his or her spouse worked together, at 30 % of the farms children also participated in farm-work, and at 18 % of the farms other family members participated as well, for example the farmer's parents or siblings. At 29 % of the farms also non-family members were employed.

Farmers who did not participate in our study did *not* differ significantly from those who participated with respect to business-features such as their size, number of people working at the farm and branch. Furthermore, farmers participating in all three data-waves (N = 314) did *not* differ significantly from those who dropped out concerning business-features (size, number of hours worked at the farm, financial situation), family-features (family size, youngest child's age) and the farmer's personal variables (age, mental and physical health). Dropouts were included in the analyses, using missing value analyses (see

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operating in different branches. An example, in 1996 1 ESU was about 1.32 milking cows or 2.41 ha. of potato's (Landbouw Economisch Instituut, 2000).

below). Most non-responders and dropouts did not give any specific reason for not responding. Only 5 % of dropout was caused by respondents leaving the population (N = 36). Of them, 17 farmers no longer participated in the FADN and were therefore not asked to participate again, 12 farmers had stopped farming, 4 farmers had moved to farm abroad and 3 farmers were too busy moving to farm elsewhere in the Netherlands.

Measures

Perceived Financial Problems are measured with an 8-item scale, comprised of 4 items developed by Welles and Defares (1984) and 4 items developed by Giesen (1991) and Mulder (1994). The scale is mainly an indicator of liquidity problems, for example: "Lately, how often has it occurred you did not have enough money to make ends meet?" Some items also refer to problems with maintaining modernity, such as: "Lately, how often has it occurred you had to work with worn-out machinery because you lacked financial means to replace them?" Answers ranged from 1 "never or rarely" to 5 "very often". The internal consistency of the scale was good: Cronbach's alpha was .84 in 1998, .87 in 1999 and .85 in 2000.

Mental Health Complaints were measured with a 12-item version of the General Health Questionnaire (GHQ; Goldberg, 1972). Respondents were asked to indicate the extent to which they had experienced certain mental health complaints the past few weeks, for example: "Lately, have you been able to concentrate on the things you were doing?" Answers were scored on a four-point scale, the formulation of which matched the content of the item, for instance answers to the question "Lately, have you felt that you were a worthless person?" was 1 "not at all" to 4 "much more than usual". Reliability (Cronbach's alpha) of the scale was .86 in each of the three years.

Physical Health Complaints were measured with a 21-item checklist, named the Dutch Health Perception Questionnaire (Vragenlijst Onderzoek

Ervaren Gezondheid (VOEG), Dirken, 1967). Respondents could indicate whether they had experienced health problems during the preceding few weeks, such as headaches, back pains, stomach complaints and cardiac complaints. Answers were scored 0 “no” or 1 “yes”. KR20 was .83 in 1998, .85 in 1999 and .84 in 2000.

Strategy of Analyses

Hypotheses were tested using structural equation modeling (SEM) with the AMOS computer program (Arbuckle, 1995). Missing values were corrected for, using the Full Information Maximum Likelihood Method (Arbuckle, 1995). To correct for measurement error, we split the scales measuring financial problems, mental health complaints and physical health complaints in 1998, 1999 and 2000 at random into two reliable halves and used them as separate indicators of nine latent variables. The raw scores of financial problems and mental health complaints were left-skewed. Therefore, prior to the SEM analyses, we performed a natural logarithmic transformation on these two scales. This led to acceptable skewness and kurtosis of the indicators, which were all below 1.5 (cf. Dunn, et al., 1994).

To examine how closely competing models fitted to the data, we calculated the three most important fit indices as advised by Hu and Bentler (1999). First was the traditional goodness of fit index Chi-square likelihood ratio ($\chi 2$). In addition, we used two fit indices that counteract problems associated with the $\chi 2$, such as the influence of sample size. Those indices were the Bonnet non-normed fit index (NNFI), and the root mean square error of approximation (RMSEA). The NNFI should be larger than .95 and the RMSEA should be below .05. For reasons of parsimony, all identical relationships were constrained to be equal across measurement moments. These are the paths with identical letters in Figure 5.3. This was no problem,

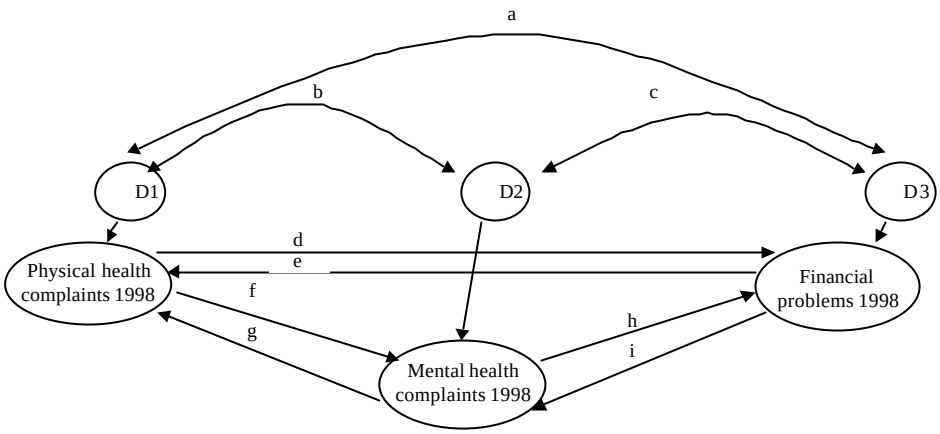

Figure 5.2. *Hypothesized short-term relationships in the 3W3V model of finances and health.*

since the time-interval between T1 and T2 equaled the time-interval between T2 and T3. Moreover, the $\chi 2$ was not significantly affected.

Hypotheses were tested in a combination of a three-wave three-variables (3W3V) model, and a structure representing the dynamic equilibrium of finances and health. Figures 5.2 to 5.4 show how this model was build up. First, we fitted a standard 3W3V model (Figures 5.2 and 5.3). Because a 3W3V model is the traditional way of testing relationships in longitudinal research, a comparison of the 3W3V model to a more complex model highlights the new findings provided by the more complex model. Short-term relationships (Hypotheses 1 and 2) were modeled by drawing arrows in both directions between variables within measurement moments (paths d to i in Figure 5.2). Figure 5.2 shows the relationships for 1998 (first data-wave); the same relationships were tested for 1999 and 2000. A "stability index" was calculated to test whether AMOS experienced problems fitting these so called "recursive subsets" (Arbuckle, 1995). This stability index should be between −1 and +1, with 0 indicating perfect stability. Note that the stability index was good for

both our models, namely .04 for the 3W3V model and .09 for the more complex dynamic equilibrium model. Furthermore, only in 1998, the residuals of finances and mental and physical health were allowed to covary to correct for relationships before 1998, (paths a, b and c in Figure 5.2).

Figure 5.3 shows hypothesized relationships over time for finances and mental health. Physical health is not included in Figure 5.3 for reasons of parsimony, but the same relationships were tested between finances and physical health and between mental and physical health. Note that this model does not yet discriminate between a stable resource level and short-term stability in variable resource levels. As can be seen in Figure 5.3, first, stability of the variables is modeled by autoregressive path coefficients, leading from one variable at one point in time to that same variable in subsequent points in time (paths j to m). These paths mean that problems in one year predispose a

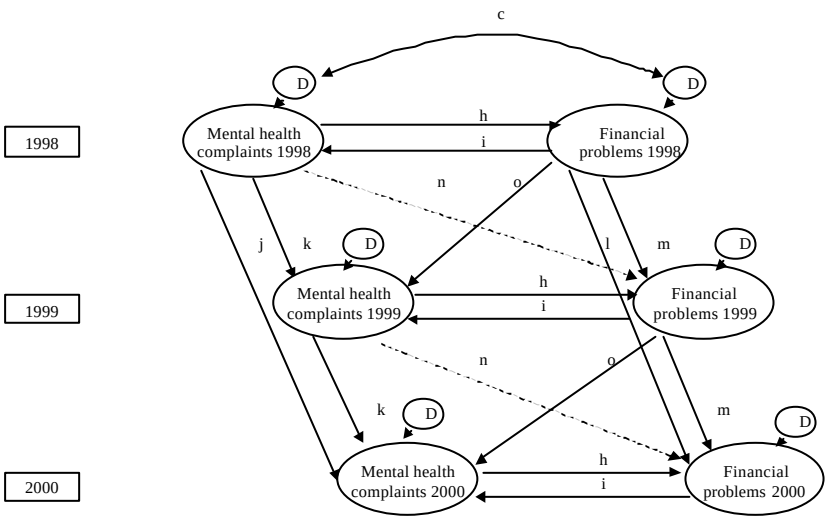

Figure 5.3. *Hypothesized long-term relationships in the 3W3V model of finances and health*

person to experiencing further problems in the subsequent years. Second, it was tested to what extent the relationships between variables could be explained by a changing, rather than a stable poor situation (Hypotheses 1b and 2b), by adding the paths from predictor-variables in a previous point in time (t-1) to the dependent variables at time t, in addition to the effect of the predictor variables at time t. An example is path o, which is the relationship between financial problems in 1998 (FP_{t1}) and mental health complaints in 1999 (MHC_{t2}) in addition to path i, which predicts MHC_{t2} from financial problems in 1999 (FP_{t2}). Equation 1 represents this:

$$MHC_{t2} = i*FP_{t2} + o*FP_{t1} + \varepsilon_{MHC.} \quad (1)$$

where ε_{MHC} is the error-term of mental health complaints. If $o = -i$, path i can be interpreted as the B-value of the difference score (cf. Saris, 2001):

$$MHC_{t2} = i*FP_{t2} - i*FP_{t1} + \varepsilon_{MHC} = i*(FP_{t2} - FP_{t1}) + \varepsilon_{MHC} \quad (1a)$$

If positive, an increase in financial problems between T1 and T2 relates to more mental health complaints at time T2. However, since we do not expect *only a change* in the predictor variables to predict the dependent variable, we did not constrain the magnitude of the effects to be equal, by reparameterizing i in (1) as $i_1 + i_2$, with $i_2 = -o$. This will reveal information that gets lost by looking only at the effect of the difference score (cf. Glasnapp, 1986). In case of our study, this is for instance the possibility that more enduring financial hardship leads to health complaints. In an equation:

$$MHC_{t2} = i_1*FP_{t2} + i_2*\Delta FP + \varepsilon_{MHC} \quad (1b)$$

Finally, we completed the model by adding a structure representing the dynamic equilibrium of finances and health (Figure 5.4 shows the dynamic equilibrium model for mental health complaints). To this end, levels of financial problems, and mental and physical health complaints were each split up into one factor representing the stable levels of problems over time and three

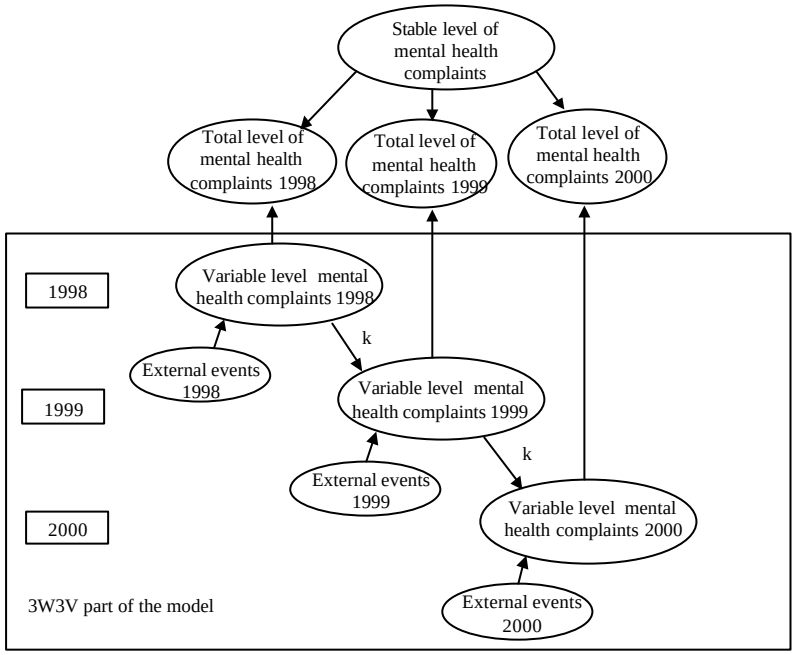

Figure 5.4. *Hypothesized dynamic equilibrium model of finances and health. Paths with the same letters are constrained to be equal. Dotted lines are expected not to be significant.*

factors representing the variable levels of problems at T1, T2 and T3 (cf. Duncan Jones et al., 1990; Ormel & Schaufeli, 1991). This so-called *stability and change model* makes several assumptions. First, all variance in financial problems and health complaints at a specific point in time is explained by the stable level of complaints plus the variable level at that point. Second, by definition, external events are assumed not to influence the stable resource levels, so no paths lead towards these stable components. We tested whether health complaints had larger stable levels than finances (Hypothesis 3). Subsequently, since we were interested in additional information that combining the dynamic

equilibrium model and the 3W3V model may provide on top of testing only a 3W3V model, the results of the 3W3V model were taken as a starting point for testing the dynamic equilibrium model. Specifically, only the significant paths of the 3W3V model (Figures 5.2 and 5.3) were drawn between the variable resource levels (Hypotheses 1b and 2b). Additionally, relationships between stable levels of finances and health were investigated, as well as the influence of the stable levels of financial problems on the variable levels of mental and physical health complaints (to the contrary of Hypothesis 1b) and that of the stable levels of mental and physical health complaints on the variable levels of financial problems (in favor of Hypothesis 2b). Finally, we investigated how much variance finances predicted in variable levels relative to total levels of health complaints (Hypothesis 1a) and how much variance health complaints predicted in variable levels relative to total levels of finances (Hypothesis 2b).

Results

Descriptive Statistics

Means, standard deviations and correlation coefficients of the observed variables are shown in Table 5.1. The mean scores on all scales were rather low, indicating that farmers experienced only mild financial problems and few health complaints. Furthermore, the number of health complaints did not change significantly over time. However, the farmers did experience fewer financial problems in the first year of study as compared to the subsequent years. Scores on the non-transformed 8-item scale increased slightly from 1.74 (SD = .64) in 1998 to 1.83 (SD = .67) in 1999 and 1.83 in 2000 (SD = .67), $F_{(2)} = 12.99$, $p < .001$.

Table 5.1. *Means, standard deviations and correlations of the observed variables, N=513, missing values are analyzed using EM*

	M	*SD*	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Time 1																			
1. Financial problems 1 [a)]	.69	.36	-																
2. Financial problems 2	.23	.33	.70**	-															
3. Mental health complaints 1 [a)]	.64	.19	.24**	.25**	-														
4. Mental health complaints 2	.55	.20	.21**	.23**	.72**	-													
5. Physical health complaints 1 [a)]	1.41	1.66	.14**	.14**	.33**	.27**	-												
6. Physical health complaints 2	1.72	2.03	.20**	.18**	.52**	.44**	.66**	-											
Time 2																			
7. Financial problems 1	.73	.34	.66**	.53**	.23**	.17**	.10*	.16**	-										
8. Financial problems 2	.28	.36	.49**	.63**	.24**	.20**	.09	.18**	.69**	-									
9. Mental health complaints 1	.64	.17	.18**	.21**	.45**	.33**	.26**	.35**	.28**	.36**	-								
10. Mental health complaints 2	.56	.19	.10*	.17**	.38**	.42**	.21**	.32**	.23**	.34**	.68**	-							
11. Physical health complaints 1	1.36	1.65	.14**	.16**	.34**	.30**	.73**	.63**	.10*	.16**	.37**	.35**	-						
12. Physical health complaints 2	1.68	2.07	.19**	.21**	.45**	.35**	.53**	.75**	.16**	.22**	.48**	.46**	.67**	-					
Time 3																			
13. Financial problems 1	.73	.35	.58**	.45**	.29**	.22**	.14**	.22**	.72**	.60**	.38**	.31**	.18**	.24**	-				
14. Financial problems 2	.27	.34	.43**	.55**	.33**	.32**	.13**	.22**	.54**	.72**	.33**	.29**	.20**	.24**	.68**	-			
15. Mental health complaints 1	.63	.17	.12*	.10*	.51**	.40**	.26**	.34**	.21**	.19**	.44**	.38**	.32**	.41**	.28**	.32**	-		
16. Mental health complaints 2	.58	.18	.06	.12*	.43**	.44**	.23**	.37**	.14**	.15**	.32**	.43**	.32**	.38**	.22**	.26**	.70**	-	
17. Physical health complaints 1	1.44	1.60	.15**	.14**	.31**	.27**	.67**	.56**	.11*	.11*	.29**	.30**	.78**	.59**	.15**	.16**	.33**	.36**	-
18. Physical health complaints 2	1.84	2.13	.19**	.18**	.37**	.30**	.54**	.68**	.13**	.16**	.38**	.34**	.63**	.71**	.24**	.23**	.49**	.48**	.69**

* $p < .05$, ** $p < .01$

[a)] Scores of financial problems and mental health complaints have been transformed using natural logarithmic transformations. Scores of financial problems range from 0 – 1.61, of mental health complaints from 0-1.39 and of physical health complaints from 0-10 (1st indicator) or 0-11 (2nd indicator).

Testing the Latent Factor Measurement Model and Theoretical Null-Model

As recommended by Jöreskog and Sörbom (1993), we tested our hypotheses following a stepwise procedure. Prior to testing the hypothesized structural relationships, we fitted a measurement model and a theoretical null-model to obtain an optimal basis for further analyses.

The measurement model included the nine latent variables for financial problems, mental and physical health complaints at T1, T2 and T3, the eighteen indicators of these latent variables, and paths leading from the latent variables to the indicators. Furthermore, the model contained covariances between all latent variables and between error-terms of identical indicators over time. The rationale behind correlating these error-terms is that identical measures are likely to be related over time because of systematic error that is not of theoretical interest, such as response bias (Fergusson & Horwood, 1988). This model fitted the data well, $\chi^2_{(81)} = 87.00$, $p = .30$, but for reasons of parsimony, we added two simplifications that did not significantly deteriorate the fit. First, we constrained the covariances between T1 and T2 error-terms to be equal to the (identical) covariances between T2 and T3 error-terms. Second, non-significant covariances between error-terms were constrained to zero. These were all the covariances between the error terms of the second indicators (see "strategy of analyses") of financial problems, between the second indicators of physical health complaints and between the first indicators of mental health complaints. The resulting model fitted well to the data, $\chi^2_{(93)} = 105.37$, $p = .18$, and was used as the basis for further model testing. Table 5.2 presents the correlations between the latent variables in the revised common-factor model.

The simplest 3W3V model was taken as the theoretical Null-model, to which models containing additional hypothesized relationships were compared. This Null-model assumes all relationships between the variables can be explained by their correlations at T1 (paths a, b and c in Figure 5.2) and autoregressions

between T1, T2 and T3 scores (e.g., paths h to k in Figure 5.2). Several autoregressive models were tested. A model assuming no direct autoregressive relationships between T1 and T3 scores and three models which additionally allowed T1 and T3 scores to relate directly for each variable separately. These latter models consider the possibility that certain complaints may fluctuate and have a latency period of more than one year, thus occurring at T1, be absent at T2 and recurring again at T3. Only for mental health complaints this proved to be the case, $\Delta\chi^2_{(1)} = 41.69$, $p < .001$, so only for mental health complaints the relationship between T1 and T3 scores was added to the Null-model, which led to a fit of $\chi^2_{(122)} = 325.25$, $p < .001$.

Table 5.2. *Correlation Coefficients among the Latent Variables, N=513 Farmers*

	1	2	3	4	5	6	7	8
Time 1								
1. Financial problems	-							
2. Mental health Complaints	.31	-						
3. Physical health Complaints	.22	.57	-					
Time 2								
4. Financial problems	.73	.28	.20	-				
5. Mental health Complaints	.24	.53	.41	.44	-			
6. Physical health Complaints	.25	.52	.86	.25	.60	-		
Time 3								
7. Financial problems	.64	.40	.26	.84	.46	.32	-	
8. Mental health Complaints	.14	.60	.43	.24	.54	.52	.39	-
9. Physical health Complaints	.23	.44	.77	.19	.47	.88	.29	.61

Testing the Three-Wave Three Variables Model of Financial Problems and Health Complaints

Subsequently, we tested hypotheses about causal and reversed causal relationships between finances, mental health and physical health by adding them one at a time to the Null-model. Results are summarized in Figure 5.5, which shows only the significant paths. This model fitted the data well, $\chi^2_{(114)} = 128.80$, $p = .16$.

Table 5.3 shows univariate increments of the fit after adding hypothesized relationships to the Null-model. First, we tested whether poor

Table 5.3. *Improvement of the c^2 after adding hypothesized paths to the theoretical null-model, N=513*

Model		$\Delta\chi^2$	*df*	I
1.1	Financial problems lead to mental health complaints	30.39	1	<.001
1b.1	Model 1.1 plus effect of increased financial problems	55.30	2	<.001
1.2	Financial problems lead to physical health complaints	3.65	1	*Ns*
1b.2	Model 1.2 plus effect of increased financial problems	4.27	2	*Ns*
2.1	Mental health complaints lead to financial problems	66.89	1	<.001
2b.1	Model 2.1 plus increased number of mental health complaints	67.97	2	<.001
2.2	Physical health complaints lead to financial problems	11.25	1	<.001
2b.2	Model 2.2 plus increased number of physical health complaints	11.34	2	<.001
3	Mental health complaints lead to physical health complaints	74.80	1	<.001
3b	Model 3 plus effect of increased number of mental health complaints	94.85	2	<.001
4	Physical health complaints lead to mental health complaints	78.20	1	<.001
4b	Model 4 plus effect of increased number of physical health complaints	117.37	2	<.001

finances predicted mental and physical health complaints (Hypothesis 1). Furthermore, to test whether variable financial resource levels rather than a stable financial resource level affects health, we tested whether a deteriorating financial situation in particular had a negative health effect (Hypothesis 1b). Results showed partial support. Financial problems did predict *mental* health complaints, $\Delta\chi^2_{(1)} = 30.39$, $p < .001$ (Model 1.1), and this effect was significantly stronger after adding increases in financial problems as a predictor, mean $\beta = .48$, $Z = 6.83$, $p < .001$ instead of mean $\beta = .20$, $Z = 5.69$, $p < .001$.

Moreover, adding the effect of change improved the fit significantly, $\Delta\chi^2_{(1)} = 24.91$, $p < .001$. Although especially the effect of *increased* financial problems was rather strong, namely mean $\beta = .37$, $Z = 4.88$, $p < .001$, a stable poor financial situation predicted mental health complaints as well, $\beta = .11$, $Z = 1.96$, $p < .05$. A model including *only* a deteriorating financial situation as a predictor fitted the data less well than the model including both a deteriorating and a stable financial situation, $\Delta\chi^2_{(1)} = 7.35$, $p < .001$. Neither poor finances nor a deteriorating financial situation predicted *physical* health complaints (Model 1.2 and 1b.2). Thus, Hypotheses 1 and 1b were accepted regarding mental health complaints, and rejected regarding physical health complaints.

Second, we tested whether mental and physical health complaints predicted financial problems (Hypothesis 2). We hypothesized that especially a stable good health condition would affect finances (Hypothesis 2b). Results supported our hypothesis. Both mental and physical health complaints led to financial problems, for mental health, $\Delta\chi^2_{(1)} = 66.89$, $p < .001$, and for physical health, $\Delta\chi^2_{(1)} = 11.25$, $p < .001$ (Models 2.1 and 2.2). Adding a *change* of the health condition as a predictor did not improve the fit significantly for either mental or physical health complaints (Models 2b.1 and 2b.2). Note that physical health complaints did not predict finances on top of mental health complaints, namely

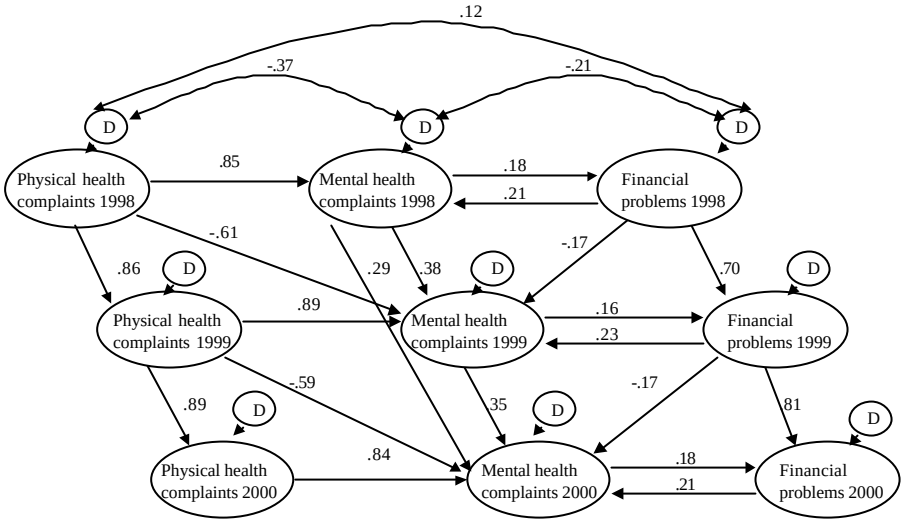

Figure 5.5. *Standardized Solution of the Final 3W3V Model of Finances and Health, N = 515* $c^2_{(112)} = 128.44$*, p = .13, BNNI = 1.00, RMSEA = .02.*

for physical health complaints, β = -.03, Z = .09, *ns*., on top of β = .25, Z = 8.15, $p < .001$ (see also Figure 5.5).

Finally, we explored causal and reversed causal relationships between mental and physical health. Additionally, we tested whether *changes* in mental health predicted physical health and vice versa whether *changes* in physical health predicted mental health. As expected, both causal and reversed causal effects between mental and physical health complaints were significant (Models 3 and 4 in Table 5.3). Furthermore, adding changes in mental health complaints as a predictor of physical health complaints further improved the fit of Model 3, $\Delta\chi^2_{(1)} = 20.05$, $p < .001$. The effect of a deteriorating mental health condition was about as strong as that of stable poor mental health, namely β = .18, Z = 4.36, $p < .001$ in addition to β = .15, Z = 5.01, $p < .001$. Concerning physical health,

particularly a *change* in physical health condition affected mental health, $\beta = .62$, $Z = 5.78$, $p < .001$ in addition to $\beta = .26$, $Z = 2.57$, $p < .001$. In the summarizing model (Figure 5.5), the paths leading from mental health complaints to physical health complaints were not significant, so these results suggest that financial problems do *not* lead to physical health complaints through mental health complaints.

Testing the Dynamic Equilibrium Model of Financial Problems and Health Complaints

As a final step in the model building, for both finances and health a dynamic equilibrium structure was added to the 3W3V model (cf. Figure 5.4). For each of the three variables separately, such a dynamic equilibrium model fitted the data well (Table 5.4). As predicted in Hypothesis 3, the stable levels of mental and physical health complaints were larger than the stable level of financial problems. For finances, the stable resource level explained between 14 and 18 percent of variance in total levels of financial problems. For physical health complaints these percentages ranged from 62 to 71 % and for mental health complaints from 48 to 56 %. This indicates that external events influenced finances stronger than mental and physical health.

Table 5.4. *Fit Indices of different stability and change models, N=513*

Model	χ^2	*df*	*p*	NNFI[a)]	RMSEA[b)]
1. Stability and Change of Financial problems	4.76	5	.45	1.00	.00
2. Stability and Change of Mental Health	2.14	6	.92	1.00	.00
3. Stability and Change of Physical Health	5.70	5	.34	1.00	.02
4. Stability and Change of Financial Problems, Mental and Physical Health	138.12	118	.10	1.00	.02

[a)]NNFI = Non-normed fit index. [b)] RMSEA = root mean square of approximation

Furthermore, the separate dynamic equilibrium models showed that the variable levels of mental health complaints changed randomly; the autoregressive paths between the variable levels of mental health complaints were *not* significant. This means that stability in total levels of mental health complaints was only the result of internal homeostatic processes and mental health complaints caused by external events at one point in time did not predispose farmers to experience mental health complaints at the next measurement moment. For physical health complaints, the autoregressive paths were somewhat lower than in the 3W3V model, but still significant. Finally, for financial problems autoregressions accounted to an important extent for stability in variable levels of financial problems (See also Figure 5.6).

Concerning the relationships between finances and health in the dynamic equilibrium model (Figure 5.6), a first interesting finding is that only the stable levels of *mental and physical health* complaints were significantly related. No significant correlation was found between on the one hand the stable level of financial problems and on the other hand stable levels of mental or physical health complaints. These results suggest that stable levels of finances and health complaints are not under the influence of the same mechanisms restoring the equilibrium, such as personality variables. Furthermore, they refute Hypothesis 2b, according to which a higher stable level of health complaints would cause higher stable levels of financial problems.

Second, in line with Hypothesis 1b, the effect of the stable level of financial problems on the variable levels of mental and physical health complaints was not significant. Only the *variable* levels of financial problems predicted variable levels of mental health complaints. Consequently, consistent with Hypothesis 1a, financial problems were stronger predictors of the variable levels of mental health complaints than of the total levels of mental health

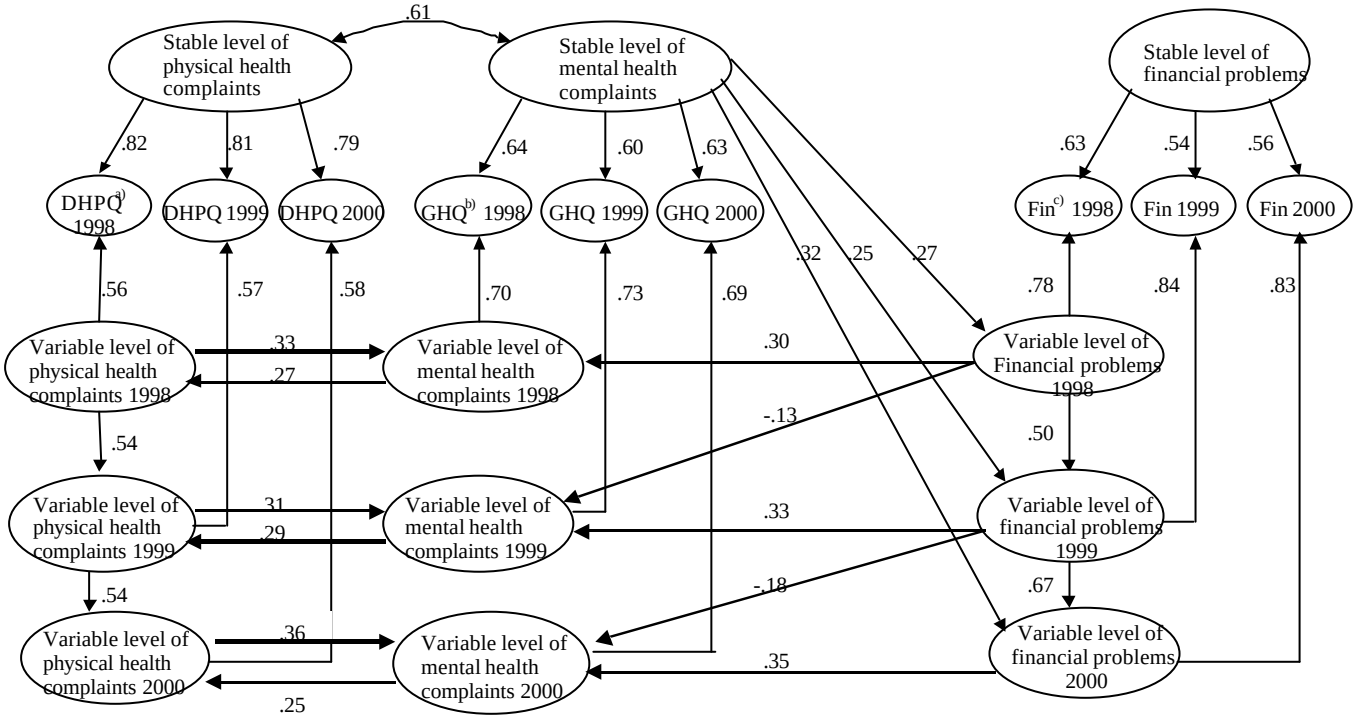

Figure 5.6. *Final Dynamic Equilibrium Model of Finances and Health, N = 515.* $c^2_{(118)} = 138.12$, $p = .10$, $BNNI = 1.00$, $RMSEA = .02$

complaints (making no distinction between variable and stable levels). A model containing no other predictors of mental health complaints besides finances showed that financial problems predicted 8 to 12 % of the variance in variable levels of mental health complaints, which corresponds with 3.6 to 6 % of total levels of mental health complaints. No relationship was found between variable levels of financial problems and variable levels of physical health complaints.

Third, partial support was found for Hypothesis 2b that a stable poor health condition rather than short-lived health problems influence the financial situation. Although higher stable levels of mental and physical health complaints did not influence the *stable* level of financial problems, the stable level of mental health complaints did affect the *variable* levels of financial problems constantly and with the same magnitude at every point in time. This was not the case for physical health complaints. Additionally, the effect of the variable levels of mental and physical health complaints on the variable levels of financial problems turned out to be non-significant. Again, supporting Hypothesis 2a, these results imply that the effect of (the stable level) of mental health complaints on the variable levels of financial problems was larger than on the total level of financial problems, including both stable and variable levels. Mental health complaints explained between 2 to 3 % of the variance in variable levels of financial problems on top of previously experienced financial problems expressed in the autoregression coefficients. This corresponds with 1.4 to 2.3 % of total levels of variance in financial problems. Deviations in levels of financial problems from their stable baseline were best explained by financial problems experienced the year before, which explained between 45 to 68 % of the variance in variable levels of financial problems. This indicates that initial loss of financial resources begets a further loss of financial resources.

Discussion and Conclusion

This three wave longitudinal study among 513 farmers investigated the interplay between two important resources, namely farmers' finances[10] and health. The theoretical objective of the study was to expand conservation of resources (COR) theory (Hobfoll, 1988; 2001), by postulating a dynamic equilibrium model of resources. We hypothesized that all resources have stable levels, but that external events can cause fluctuations in these stable resource levels, expressed in a variable level (cf. Heady & Wearing, 1989). In the light of stability and variability of finances and health, we examined their bi-directional relationship both within measurement moments and over time.

Using structural equation modeling, two different types of models were tested. First was a traditional 3-wave 3-variables (3W3V) model, which does not differentiate between stable and variable levels of resources. The only way to get an indication about the variability of resource levels in this model is by testing whether resource levels have actually changed over the past year. The second model was a so-called "stability and change"-model (cf. Duncan-Jones et al., 1990; Ormel & Schaufeli, 1991), which divides resource levels into a stable and a variable level.

Outcomes of the 3W3V model showed partial support for the hypothesis that poor finances predict ill health (Hypothesis 1). Within measurement-moments, financial problems such as not being able to pay the bills on time and not having enough money to make ends meet, led to mental health complaints, but not to physical health complaints. Additionally, in line with the premise of COR theory that a net loss of resources causes distress rather than a stable poor situation, in particular an *increase* in financial problems over the preceding year was responsible for the effect (Hypothesis 1b). Farmers

[10] It might perhaps be more correct to use "*Lack* of financial resources" here, considering the way we measured this variable. However, we prefer the term "financial resources" because it improves the clarity of our paper.

whose financial position had deteriorated over the past year experienced a significantly larger increase in mental health complaints than farmers whose financial position remained unchanged. Note that the effect of change in financial problems we tested was curvilinear, since we used a ln-transformation of the scale to correct for non-normal distribution (Plewis, 1985). Specifically, the effect of change at the beginning of the scale, thus from no problems to a few problems, was modeled to be larger than the effect of change at the end of the scale, from several to many problems. In other words, a farmer who has some liquidity problems now, but who did not have any last year is expected to experience a larger increase in health complaints than a farmer who has very many financial problems, but who already had many a year ago. However, this is in line with results from previous stress-research, showing that the relationship between stressors and strains often has such a curvilinear course (Warr, 1997).

For a reversed causal relationship support was found as well. Within measurement moments, both mental health complaints and physical health complaints predicted the occurrence of financial problems (Hypothesis 2). However, the effect of *physical* health complaints was insignificant on top of the effect of mental health complaints. It may be surprising that poor physical health played a more modest role in predicting finances than mental health, considering the physical nature of farming. A possible explanation may be that farmers more easily find ways to adjust to poor physical abilities than to poor mental health. When facing physical illnesses, this may mainly impair manual labor such as making hay, milking or feeding the cattle, which may be taken over by other people. In case farmers need to hire personnel to replace themselves, this may have financial consequences. However, farm-families have a large range of potential labor sources they can drawn upon without overt financial transaction taking place (Gasson & Errington, 1993), comprised of other family members such as the farmer's spouse, children, or retired parents,

which traditionally provide much of the flexible - ad hoc or peak - labor requirements. Adjustment to ill *mental* health may be much harder, as it may affect less tangible abilities that may long go unnoticed, such as a farmer's motivation and cognitive functioning (Jex, 1998). Additionally, consequences may be more far-reaching, as mental problems may not only impair manual, but also administrative and managerial tasks. Moreover, mental health problems may lead to poorer social functioning, such as being unusually withdrawn and detached (Jones & Fletcher, 1996) or even socially "undermining", which is being hostile, reacting negatively towards other people's efforts and hindering others in attaining instrumental goals (Vinokur, Price and Caplan, 1996; Westman & Vinokur, 1998). It is not unlikely that poorer social functioning may have a negative impact on the support given by other family members.

Testing a dynamic equilibrium model of health and finances led to the following additional insights. First, as predicted in Hypothesis 3, farmers clearly reported smaller stable levels of financial problems than of health complaints. Stable levels explained between 14 and 18 percent of variance in total levels of financial problems, whereas for physical health complaints these percentages ranged from 62 to 71 and for mental health complaints from 48 to 56. This means that external events influenced finances to a larger extent than health, causing levels of financial problems to deviate more from their characteristic baseline levels. Following COR-theory it was theorized that financial resources would be less stable because they are "energies", resources that are invested more easily than other resources. Additionally, financial resources are "used up" when invested, which is not the case for health. Another possible explanation for the finding that finances are less stable than health would be that farmers faced more external events that potentially affected the financial situation, such as fluctuations in production-costs, than events potentially threatening their health condition. Although the present study did not address external events, this explanation is not very satisfactory. Other studies have shown that farmers

may be facing relatively many potential health hazards related to working with dangerous machinery, chemicals and livestock (e.g. Gallagher & Tierney, 1996). The farmers in our study seemed no exception, as may be illustrated by the fact that annually 5 % of the farmers in our sample reported having had farm accidents. This is about twice as many as among the Dutch working population and about 3.5 times as many as among the Dutch self-employed (Centraal Bureau voor de Statistiek, 2000). A third plausible explanation would be that finances and health are not under the influence of the same homeostatic processes. Health is under the influence of lower level, physiological feedback mechanisms, which are more refined and much faster than higher-order feedback mechanisms involving cognition or behavior (Lovallo, 1997). Higher order processes typically apply to finances. The finding in the present study that the stable levels of finances and health are unrelated underscores that finances and health are not under the influence of the same homeostatic processes.

Although financial problems had only a relatively small stable component, the financial situation did not change completely at random from one measurement-moment to the next. Financial problems at one point in time did predispose farmers to experiencing financial problems in the near future, supporting one of the premises of COR-theory (Hobfol, 2000) that initial resource loss begets further loss. Furthermore, it indicates that attempts to change the financial situation need some time to take effect. For physical (but not for mental) health complaints, this effect was found as well.

Concerning the effect of finances on health, differentiating between a stable and a variable level of financial problems revealed more evidence for the premise that *only* net change in resource levels affects health (Hypothesis 1b). Namely, the stable level of financial problems did not relate to mental or physical health, but only *variable* levels of financial problems that had not changed over the past year. This qualifies the earlier finding from the 3W3V model that a stable poor financial situation, too, predicted health complaints, be

it less strongly than a deteriorating financial situation. Apparently, this is only the case when financial problems are not at their stable baseline levels. A plausible explanation is that farmers are investing other resources in order to restore original (low) levels of financial problems. These investments may cause net losses of other resources not included in this study. An example is extra time invested in farm or off-farm work, because of which less time can be spent with family or friends or on hobbies. Another possibility would be that stable baseline levels equal "not having any problems". Naturally, when farmers are not facing financial problems, no stress is expected to ensue.

Concerning the effect of health on finances, results showed that a different mechanism caused this relationship to occur. Partially supporting Hypothesis 2b, farmers with a higher stable level of *mental* health complaints (but not of physical health complaints) were more vulnerable to experiencing financial problems. Contrary to our expectations, this was not because these farmers had higher stable levels, but because they had higher variable levels of financial problems. This indicates that a stable, good mental health condition indirectly protects farmers against negative influences of the external environment on finances. Presumably, farmers with better mental health are better able to use financial opportunities in their favor or to deal with financial risks. This implies that good mental health is especially important as a protective factor against resource loss during hard times and vice versa, it promotes resource gain in an environment providing financial opportunities.

Our results contradict the so-called "principle of cumulative causation" (Myrdal, 1962) that several authors, including ourselves, have defended based on analyses which did not discriminate between stable and variable resource levels (e.g. Aldwin & Revenson, 1986; Gorgievski-Duijvesteijn, et al., 2000; Taris, et al., 1998). According to this principle, reciprocal relationships between stressors and strains would cause individuals to become gradually more vulnerable for experiencing stress, as decreased mental and physical well-being

that is the result of experiencing stress would render a person to be even more vulnerable for experiencing further exposure to stressors. Rather, concerning mental health, our study lends stronger support for a trait approach. Indeed, previous studies have shown that the stable level of health complaints may correlate up to .80 with personality variables such as neuroticism (Ormel & Schaufeli, 1991). However, the finding that initial financial problems and physical health complaints problems predisposed individuals to experiencing further financial problems, respectively physical health complaints, also leaves room for a more dynamic explanation of vulnerability as far as other resources then mental health are concerned.

In sum, testing a dynamic equilibrium model of resources has provided valuable insights not attained by more traditional approaches in stress-research, which have significant theoretical implications. Most importantly, it allowed us to distinguish different kinds of resources based on the extent to which they have stable baseline levels. Additionally, it has revealed two different mechanisms explaining how these resources operated in the stress process, only one of which has been well elaborated in COR theory. Although it is tempting to conclude that the distinction between different resources based on their level of stability coincides with the role they play in the stress process, no firm conclusions can be drawn based on the current study. This possibility deserves more attention in future research. A theoretical guideline for further studies may be provided by resource theories applied in other fields of study, such as cognitive psychology (Navon, 1984) or human development and education (Freund & Riediger, 2001). These resource theories divide resources into two kinds, to an important extent paralleling our distinction of changeable and stable resources. First are “commodities”, resources available in finite quantities that at a specific point in time can only be used for one purpose or by one user only. Second are “alterants”, infinite resources that at the same time can be used for several different purposes, such as mood states or personality

characteristics, or by different users, such as a pleasant work-climate in an office. Alterants are expected to aid in investing commodities efficiently. Freund and Riediger (2001) have argued that COR theory should be restricted to "commodities". We do not favor such a solution. Rather, we propose that COR-theory should be expanded. The reason why some resources are more stable than others needs to be better understood, as well as the role stable (infinite) resources play in the stress process.

Another theoretical implication of our results concerns the mechanisms maintaining stable resource levels. Our results indicate that, besides the COR-theoretical explanation that resource levels are kept stable through investment of other resources, also other mechanisms are involved in keeping resource levels stable. Concerning health, these are typically lower level physiological mechanisms (Lovallo, 1997).

Our study had several shortcomings. First, our study did not provide information on the objective environment in which farmers were operating. In future studies, our dynamic equilibrium model of resources could be expanded with objective, external events that potentially threaten or replenish resources so that the moderator hypothesis according to which healthier individuals are more resilient to external threats and better able to use opportunities in their favor could be tested directly. Furthermore, it would be interesting to compare the robustness of the model among samples operating in different objective environments, for instance samples facing more severe and acute health threats with those who face few of such threats. Additionally, a next study could benefit from including objective measurements of resource levels. Particularly financial resources lend themselves well for objective measurement.

Second, our study did not contain specific information on internal homeostatic processes keeping resources at stable baseline levels. It would be interesting to gain more insight into these internal processes, especially from a long-term perspective. In this respect, it would also be interesting to examine to

what extent a "stable baseline level" of resources has psychological meaning. If we theorize people will be motivated to maintain stable resource levels, we are assuming people have a conscious notion of what these stable levels are, especially in case less automated cognitive or behavioral processes are involved. The question that remains to be answered is whether this is really the case.

Third, our study had a longitudinal design with three measurement moments, each of which had exactly a one-year period of time in between. This is a minimal requirement for the purpose of our study. Namely, the stable baseline levels of finances and health include all variance that has been stable across the three measurement moments. However, even problems that have lasted constantly for the past two years may not necessarily be someone's "stable baseline". Therefore, the stable levels of financial problems and health complaints may have been somewhat overestimated. However, considering the possibility that the stable baseline level of financial problems for some farmers may have meant a long-lasting unusually poor or good financial situation, it is even more remarkable that this stable baseline level of finances did not explain health complaints.

Finally, our study addressed a specific sub-sample of the Dutch population, namely farmers, most of whom were male. This leads to the question to what extent our results can be generalized to other samples, particularly to what extent they would apply to other samples of the working population or to women. For instance, a previous study showed that the health condition of farm-wives did not predict their finances (Gorgievski-Duijvesteijn et al., 2000). We do not suggest this finding indicates that a good mental health would not buffer farm-wives or women in general against resource loss. Rather, we believe farm-wives' effectiveness impacted other resources than their finances. The farm-wives' in that particular study were primarily responsible for the home and the family, whereas their husbands were the breadwinners, thus primarily responsible for the farm and the income. Healthier farm-wives may,

for instance, have had closer relationships with their relatives. This underscores the necessity to take into account the context in which individuals function, the roles they fulfill and the goals they pursue, in order to understand the relationship between their resources.

In spite of its limitations our study has provided valuable insights into the stress process among a poorly researched group, the self-employed. In one model it has integrated in a comprehensive way several complex mechanisms that up till now had only been described and studied fragmented and piecemeal. COR-theory turned out to be a helpful guiding framework for doing so.

As for practical implications, most importantly, this study shows that finances and mental health influence each other in a mutual way. Improving the financial situation of farmers helps them to feel better. However, reducing mental distress caused by financial problems will not automatically cause them to be better able to manage their finances. Unfortunately, for this reversed effect a *stable* good mental health condition was found to be the active ingredient, which can only be altered using long-term processes of social and personal change and not by reducing short-term stressors. Therefore, professionals assisting farmers during hard times should pay extra attention to those with poor mental health prior to the onset of financial adversities, to help them deal with the situation more effectively.

CHAPTER 6

CONCLUSION

This thesis investigated the relationships between farmers' financial prospects, their well-being and that of their spouses. More specifically, it focused on causal and reversed causal relationships between financial prospects and well-being. In addition to the longitudinal designs employed, a distinctive feature of this thesis is that the financial situation was assessed both subjectively and objectively. Problems with finances are critical to the farming community today, and to date, only very little research has been done on its psychological consequences.

As outlined in the historical overview in Chapter 1, during the past half century, recurrent restructuring of agriculture has had far-reaching consequences for individual farmers and their families. Most importantly, many farmers have seen the financial prospects of their business decline, which was also reflected in the data of our research (Chapters 4 and 5). That is, whereas in 1998 about 20 per cent of the farmers had insufficient financial means to fulfill their short-term financial obligations, during the following two years, this percentage increased to over 30 per cent.

The relationships between financial prospects and well-being were investigated in two separate studies, results of which have been reported in Chapters 2 to 5. The first investigation was a ten-year follow-up study among Dutch dairy farm-couples (Chapters 2 and 3). Dairy farmers had rather good financial prospects before and during the time of data collection, in contrast to farmers in other branches (Landbouw Economisch Instituut, 1998). The second investigation was a three-wave longitudinal study spanning two years among a broader sample of Dutch agriculturalists and horticulturalists

(Chapters 4 and 5), many of whom were facing poor and deteriorating objective business prospects. During the study, particularly arable crops and pig farmers had had hard times. The purpose of this concluding Chapter is to integrate and discuss the findings of the separate studies as well as to discuss their strengths and weaknesses. The research questions that were formulated in Chapter 1 will serve as a guiding principle. Finally, some implications for theory and practice are presented.

Finances Predict Well-being: Do Objective Financial Prospects Matter?

The first research question this thesis addresses is whether a poor financial situation impairs farmers' well-being, and specifically, whether a poor *objective* financial situation makes a difference. The objective financial situation was calculated by means of a simulation model developed by the Dutch Agricultural Economics Research Institute (LEI; Mulder, 1994, 1996), based on their Farm Accountancy Data Network (FADN). The resulting financial indicator, the financial economic perspective for continuing the farm business – from now on denoted as objective financial prospects, reflects the extent to which farmers are able to meet their financial obligations in the short, the middle and the long term. This indicator not only pertains to the business, but also to the farmer's household. That is, it also indicates to what extent the family's current standard of living can be uphold in the future. For a detailed discussion of the way the farmers' objective financial situation has been operationalized see Mulder (1994, 1996). In a series of validation studies, it has been shown that this indicator of the farmer's objective financial situation accurately predicts foreclosure of farms at the branch level (e.g., Baltussen & Van der Veen, 1998; Daatselaar, et al., 1999; Landbouw Economisch Instituut – Dienst Landbouwkundig Onderzoek, Proefstation Bloemisterij en Glasgroenten & Centrum voor Landbouw en Milieu, 1998). In our research, objective financial prospects significantly predicted *experienced* financial

problems of the individual farmer, explaining between 8 and 17 per cent of the variance. Although this convergence is rather modest, it should be kept in mind that both financial indicators come from different data sources: objective and subjective. Moreover, previous farm studies based on telephone surveys, in which farmers were asked about their objective financial situation – debt load, assets and family income – and the extent to which they experienced financial problems, found similar results (Armstrong & Schulman, 1990; Lorenz et al., 1993). Generally speaking, relationships between self-report measures are expected to be higher, because of common method variance. For instance, farmers may underreport both their debt load and the problems they have paying their bills in time, which artificially boosts the relationship between both variables.

Furthermore, objective financial prospects did predict well-being, in particular decreased motivation to continue the farm business and mental health complaints, but *not* impaired *physical* health. The effects on mental health complaints were rather small. Nevertheless, the results contradict most previous farm-studies, which showed *no* relationships between objective financial indicators and well-being (e.g., Armstrong & Schulman, 1990; Cary & Weston, 1978; Duncan, et al., 1988; Keating, 1988; Schulman & Armstrong, 1989; Swisher, et al., 1998; Welles & Defares, 1983). It seems plausible that these previous studies have underestimated the effect of the objective financial situation for two reasons. First, in contrast to our study, they did not use a validated, multifaceted indicator to assess the objective financial situation; single factor indicators do not adequately tap the farmer's complex financial situation. Second, these previous studies did not use advanced structural equation modeling techniques, so they were unable to correct for factors that may artificially suppress relationships between objective stressors and well-being. Examples of such factors are unreliability in the measurement of constructs, and homeostatic processes because of which mental health complaints remain

at a stable, low level. Hence, our study shows that a (weak) positive relationship exists between farmers' objective business prospects and their subjective well-being, provided that the former is appropriately operationalized and that proper advanced statistical techniques are employed.

Experienced financial problems were a better predictor of impaired well-being, i.e. mental health and the intention to quit the business, than poor *objective* financial business prospects. Additionally, supporting the proposed stress-perception model (Figure 1 in Chapter 1), experienced financial problems fully mediated the relationship between objective financial business prospects and well-being. That is, farmers with poor financial business prospects reported poorer well-being, *because* they experienced more financial problems. It should be noted, however, that experienced financial problems, just like objective financial prospects, did *not* predict impaired *physical* health. Possibly, a whole range of other, more direct factors influences farmers' physical health condition either positively or negatively. Many potential health hazards have been identified, which were, for instance, related to working with agricultural machinery, chemicals and large animals (Galagher & Thierney, 1996). On the other hand, outdoor physical work may harden farmers (Bernard & Krupat, 1994). Therefore, they may only report rather severe physical health problems. If these were caused by financial problems, they would typically have occurred after a long period of exposure. In this research they could not be identified. In the three-wave study the time span was probably too short (two years). In the ten-year follow-up, too little information was available on developments in the financial situation.

Although it is plausible that experienced financial problems are better predictors of impaired well-being than objective business because of common method variance, it is unlikely that this is the only explanation. Results of the ten-year follow-up study among farm-couples (Chapters 2 and 3) indicate that farmers and their wives perceive experienced financial problems similarly. That

is, they agree to a large extent on their financial problems in both the business and in the household domain. This shows that farmers' perception of their financial prospects is not ideosyncratic, but that it is shared by their wives, and that it is therefore intersubjective in nature.

To conclude, objective financial business prospects do matter. They predict both impaired well-being and the extent to which farmers experience financial problems. However, the extent to which farmers *experience* financial problems turned out to be most important. It is a stronger predictor of well-being (impaired mental health and the intention to quit the business) than objective financial prospects. Nevertheless, experienced financial problems seem to be rooted in reality. This is shown in the convergence of subjective and objective business prospects, but even stronger in the intersubjective agreement on the financial situation between husbands and wives.

Changes In The Financial Situation Predict Well-Being; Does a Primacy Of Loss Exist?

The results of our research indicate that the effects of a poor financial situation on well-being occur in the short term rather than in the long-term. For instance, the three-wave longitudinal study with one-year time intervals shows simultaneous effects rather than lagged effects of both poor objective financial prospects (Chapter 4) and experienced financial problems (Chapters 4 and 5). In a similar vein, the ten-year follow-up study (Chapter 3) showed *no* long-term effect of experienced financial problems on impaired mental and physical health. Finding a simultaneous effect does not necessarily mean that the financial situation influences well-being cross-sectionally, i.e. at the same time (Zapf et al., 1996). However, it does mean that the time lapsed between the occurrence of financial problems and their effect on well-being may be rather short lived: a few weeks or a few months, rather than a year or longer. Additionally, today's financial problems may relate to farmers' well-being next year, provided financial problems are persistent and are still experienced next

year. Results show this is often the case: financial problems are rather stable across time, that is, farmers who currently experience financial problems are likely to experience such problems next year as well (Chapters 4 and 5), and even ten years from now (Chapter 3).

So far, the results are in line with the "exposure time model" (cf. Frese & Zapf, 1994; see Chapter 1), according to which financial problems are expected to have a negative influence on well-being *until they are solved*. After they have been solved, this negative effect is expected to wear off. Based on Conservation Of Resources (COR)-theory (Hobfoll, 1988; 1989; 2001) it was proposed that the effect of a stable, poor financial situation would result from (failed) attempts to solve financial problems, which would not be without costs. After all, COR-theory predicts that resource *loss*, rather than stable low resource levels would affect well-being, the so-called "primacy of loss" - principle. Some *indirect* support was found for this proposition by dividing recourse levels into a stable, characteristic baseline and variable levels, in line with the so-called dynamic equilibrium model (Duncan-Jones et al., 1990; Heady & Wearing, 1989; Ormel & Schaufeli, 1991; see Chapter 5). To test this model, financial resources were represented by experienced financial problems, which, in fact, indicate a lack of financial resources. This analysis showed that enduring financial problems *only* affected farmers' mental health when they deviate from farmers "normal" characteristic levels. This means that some farmers temporarily adapted to their poor financial situation, for instance by not paying their bills on time, without definitely solving their financial trouble. A more definitive, psychological way to "solve" the financial problems is, for instance, by devaluating the meaning of money (cf. Pearlin & Lieberman, 1979). As one of the farm-wives in our pilot study said: "Most people think we have financial problems, because they take their own expenses as a starting point. They tell me that I have to buy this or that, but we don't need all of these things. They don't know how little money we need to have a good life. Our farm provides us with

most of our food. We don't have children, so we don't wear out our furniture or our clothes as fast as other people do. We really don't need much besides our farm and our animals."

A more direct way to investigate the "primacy of loss"-principle (Hobfoll, 1988; 1989; 2001) is to test whether a deteriorating financial situation affects well-being to a larger extent than a stable poor financial situation. This was tested for both experienced financial problems (Chapters 4 and 5) and objective financial prospects (Chapter 4). Results showed partial support. An increase in experienced financial problems compared to the year before significantly predicted impaired mental health complaints, but *not* physical health complaints or the intention to quit the business. Since a physical health effect is expected to occur only after prolonged exposure to financial problems, this may not be a surprise.

As to *objective* financial prospects, changes did *not* predict impaired mental health. This could be taken as an indication that the "primacy of loss" – principle is invalid. However, another explanation for this particular result may be more favorable. Namely, it is likely that *stable* poor objective financial prospects may remain latent for a while, only gradually causing an *increase* in experienced financial problems over time. In other words, it may take some time for poor objective financial prospects to "translate" into a subjective perception, to come to mind as it were. When objective financial prospects start to decline, farmers may respond with routine adaptations (cf. Frese, 1986). These "automatic" adaptations are expected to cost little effort and – by definition – they do not come to the farmer's mind. Therefore, they will not produce distress. A typical example is working longer hours on the farm (Hillebrand, et al., 1995). However, if objective financial prospects persist to be poor over a longer period of time, farmers may come to realize they are in real trouble and the standard ways of coping with financial problems do not suffice to tackle the problem. That is, they now need to react in a non-routine fashion

(cf. Frese, 1986), for instance by borrowing money to cushion financial setbacks. This study indeed showed that farmers who had had poor objective financial business prospects for a longer period of time experienced more financial problems than those whose business prospects had only recently declined.

To conclude, the results do show that *changes* in financial prospects affect well-being. However, no strong indications were found for *primacy* of loss, since the influence of a stable poor financial situation was comparable to that of changes in the financial situation. Moreover, whether changes in the financial situation predicted well-being depends on which outcome measure is used. The results suggest it may only apply to affective aspects of well-being. Additionally, in contrast to an increase in *experienced* financial problems, decreasing *objective* financial prospects did *not* predict impaired well-being, apparently because changes in objective resource levels may initially escape farmers' notice.

Well-being Affects Farmers' Finances; The Treadmill of Declining Farm Business

Results of the current research show strong support for reversed causation (Research Question 2): farmers' well-being predicts their objective and subjective financial situation. In contrast to the effect of financial prospects on well-being, reversed causal effects are found in both the short term and the long term. Farmers with impaired mental health were found to experience more financial problems; from one year (Chapters 4 and 5) up to ten years after impaired mental health was measured (Chapter 2). Moreover, farmers' well-being also affected their objective financial prospects, albeit modestly and indirectly (Chapter 4). Finally, farmers' intention to quit the business directly impaired their objective financial prospects a year later (Chapter 4). The consistency of these results contradicts the ambiguous findings among employees on pay-role (Zapf, et al., 1996). This supports the contention

(Chapter 1) that results obtained among employees may not generalize to farmers, or to the self-employed in general, because the self-employed can be expected to have a more direct influence on their financial situation than employees on pay-role.

Surprisingly, *physical* health complaints did *not* predict experienced financial problems over and beyond impaired mental health (Chapter 5). Considering the physical nature of farming, it poor physical health could be expected to be a stronger predictor of the financial situation than poor mental health. A possible explanation may be that farmers more easily find ways to adjust to poor physical abilities than to poor mental health. When a farmer is physically ill, this may mainly impair manual labor such as making hay, milking or feeding cattle, which other people easily may take over. Only in case farmers need to hire personnel to replace themselves, this may have financial consequences. However, farm-families have a large range of potential labor sources they can draw upon without overt financial transactions taking place (Gasson & Errington, 1993). These labor resources include the farmer's spouse, children, or retired parents, which traditionally provide much of the flexible - ad hoc or peak - labor requirements. In contrast, coping with *mental* ill-health may be much more difficult, as it may affect less tangible, overall abilities that may long go unnoticed, such as a farmer's motivation and cognitive functioning (cf. Jex, 1998). Compared to physical ill-health, consequences are likely to be more far-reaching, as mental problems may not only impair manual, but generalize to administrative and managerial tasks. Moreover, mental health problems may lead to poorer social functioning, such as social isolation and detachment (Jones & Fletcher, 1996) or even to social "undermining", which refers to being hostile, reacting negatively towards other people's efforts, and hindering others in attaining instrumental goals (Vinokur, Price & Caplan, 1996). It is not unlikely that poorer social functioning has a negative impact on the support given by other family members (Westman & Vinokur, 1998).

Closer investigation of the nature of the reversed causal relationships revealed two separate processes causing farmers with poor well-being to be more vulnerable for experiencing financial distress. The first process is best described as a vicious circle, in which impaired well-being *that is the result* of facing stressors causes further deterioration of the stressful situation. The second offers a more static explanation of vulnerability, showing farmers with poor stable mental health are more vulnerable to experiencing financial problems. First the vicious circle will be described. This is the so-called "principle of cumulative causation" (Myrdal, 1962) – or in terms of COR-theory a "negative loss-spiral". Specifically, the three-wave longitudinal study showed (Chapter 4) that experienced financial problems increased farmers' mental health problems and their intention to quit their business. In turn, farmers' intention to quit impaired their objective financial business prospects one year later, probably because they decreased their material and immaterial investments. Thus, the decision to quit tended to consolidate over time. Consistent with these findings, a recent economic study showed that farmers who intended to quit their business had less modern farms (Van der Veen et al., 2000).

One of the main motivations to withdraw from farming may be reducing the negative emotions related to experiencing financial problems, or reducing farm-stress in general (cf. Farrell & Rusbult, 1981; Rusbult & Farrell, 1983). By (emotionally) distancing from the job, work-related stressors are expected to become less important, because of which they would affect the farmer to a lesser extent (cf. Lee & Ashford, 1993). However, instead of a positive effect, intention to quit only had a negative effect on well-being. In other words, it appears to be an ineffective way of coping with financial problems. The intention to quit led to impaired mental health both directly, and indirectly through deteriorating financial prospects. This is consistent with results of studies among other occupations, for instance among general

practitioners. Although withdrawal in these studies is of a different nature, namely depersonalizing patients, it was found to deteriorate doctors' stressful situation and consequently their health condition (e.g., Bakker, et al., 2000).

By qualifying the intention to quit as an "ineffective way of coping with financial problems" it not suggested that the decision to quit farming is a "wrong" decision in response to financial problems, or that farmers should keep investing even though they intent to quit. On the contrary, the larger the prior investments, the more difficult and painful the actual farm-closure is expected to be in the end. After all, more investments will be lost (Hobfoll, 1988; 1989; 2001). Indeed, a qualitative study of Rosenblatt (1990) described how farmers who hung on to their business in spite of poor and declining financial prospects experienced severe emotional consequences. This was particularly the case if in spite of all their efforts they were unable to ward off farm-closure.

In addition to the "loss-spiral", the results of the current research showed a second, static process causing farmers with impaired health to be more vulnerable for financial problems (Chapters 4 and 5). In line with previous studies (Duncan-Jones et al., 1990; Ormel & Schaufeli, 1991), the levels of mental and physical health complaints were shown to have a large stable component (stable mental and physical health), which expresses the farmers' vulnerability. Stable mental and physical health levels are assumed to be maintained by internal homeostatic processes, which by definition cannot be influenced by external change agents, such as financial stressors. Stable mental and physical health were indeed strongly related. Furthermore, poor stable mental health (but not poor stable physical health) caused farmers to experience more financial problems. In contrast, temporary mental and physical health complaints, which resulted from external change agents, did *not* predict experienced financial problems.

The question may arise as to whether a "real" effect of poor stable mental health on the financial situation was revealed, rather than an artifact. After all, previous research has shown that stable mental health is strongly related to negative personality traits, such as negative affectivity (Ormel & Schaufeli, 1991), which, in its turn, has been suggested to artificially increase the association between self-reports of stressors and strains (e.g., Burke, Brief & George, 1993), because people with high negative affectivity are assumed to give negative answers in general. The present findings favor a "real" effect; poor stable mental health does play a substantive role in the stress-process. First, farmers with poor stable mental health were *only* found to be more negative about their financial situation, but no direct association was found between poor stable mental health and farmers' motivation to continue their business, which was also a self-report measure. Second, in comparison to farmers with better stable mental health, farmers with stable poor mental health did not have higher *stable* levels of experienced financial problems, i.e. on average a higher level of financial problems throughout the years. However, they did experience more financial problems at each separate measurement moment. Apparently, their experienced financial problems were more strongly affected by negative external influences, or perhaps less strongly by positive influences, than that of farmers with better stable mental health. Finally, and probably most importantly, farmers with poor stable mental health not only perceived their financial situation more negatively, their negative perception also became a self-fulfilling prophecy, since farmers who experienced financial problems were more likely to intent quitting their business, which over time impaired their objective financial business prospects.

In sum, two processes have been revealed through which poor financial prospects may impair mental health. First, a dynamic "treadmill of farm decline": farmers with poor financial business prospects experience more financial problems because of which they are more likely to intent quitting their

business. This intention, in its turn, has a negative effect on farmers' business prospects. Although the intention to quit the business may have served as a way of coping with the negative emotional consequences associated with poor financial prospects, results showed that – quite to the contrary – it increased mental health complaints. Secondly, farmers with poor mental health turned out to be more vulnerable for getting trapped into the treadmill. They experienced more financial problems over and above the effect of objective financial prospects, which over time became a self-fulfilling prophecy: their objective financial prospects indeed declined.

Job-involvement; Is it a weakness?

The third research question was: Does job-involvement influence the relationship between financial problems and well-being? Specifically, the hypothesis derived from identity theory was tested (Burke, 1991) that high job-involvement may have an unfavorable effect on well-being because it exacerbates the negative relationship between stressors and stress-outcomes. Analyses of the data from 107 Dutch dairy farm couples participating in the second wave of the ten-year follow-up study (Chapter 2) show some preliminary support for this assumption. As hypothesized, job-involvement not only coincided with job-related worrying, but, in addition, strengthened the relationship between experienced financial problems and job-related worrying.

Worrying has been found to have a wide range of possible long-term mental and physical health consequences, such as anxiety disorders and cardiovascular disease (Brosschot & Thayer, in press). Therefore, a high job-involvement may be a risk factor, causing farmers to gradually develop more mental health complaints than the less involved, as problems persist or worsen over time. However, job-involvement was not found to relate directly to mental health complaints, nor did it exacerbate the relationship between financial problems and mental health complaints. This may have been the result of a so-

called "floor"- effect. The effect of job-involvement was not investigated over a longer period of time. Additionally, the dairy farmers in our study had been doing relatively well until the time of the data-collection (LEI-DLO, 1995). For that reason, if farmers experienced financial problems, they might have been too recent for job-related worrying to impair more generalized well-being.

Since our results on job-involvement are based on cross-sectional data, the possibility of reversed causation cannot be ruled out. However, it seems unlikely that especially for higher involved farmers, worrying produces more experienced financial problems. Therefore, to conclude, the results suggest that high job-involvement may be a risk-factor for developing mental and physical health complaints in the long term, because it enhances job-related worrying, particularly in the face of financial distress.

Dyadic processes: The Relationship Between Finances and the Well-being of Farm-wives

The last research question this thesis addresses is whether the causal and reversed causal relationships between experienced financial problems and well-being are similar for farm-wives as for farmers. To the best of our knowledge, our ten-year follow-up study is the only one addressing longitudinal relationships between the farm's financial situation and farm-wives' well-being (Chapter 3). However, this study investigates long-term effects, and as the three wave longitudinal study showed, experienced financial problems only impair well-being in the short term. Cross-sectional analyses of the separate data-waves shows that, at the first measurement moment, the correlation between experienced financial problems and farmers' mental and physical health was stronger for husbands than for wives (Giesen, 1991). This may suggest that experienced financial problems affected farmers' well-being stronger than their wives'. However, since within measurement moments, the possibility of reversed causation cannot be ruled out, husbands' well-being may also have influenced the financial situation more strongly than wives' mental and physical

health. At the time of the second data wave (Chapter 2) the relationship between experienced financial problems and well-being - mental health and worrying – was about similar for farm-wives and their husbands. This is remarkable because husbands, who were all farm-operators and had been raised to become farmers from early childhood, were more strongly involved in their business than farm wives.

In the long term, in contrast to husbands' mental and physical health complaints, wives' health complaints did *not* predict financial problems. Given the different roles farmers and their wives fulfill at the farm, this may not come as a surprise. For example, husbands spent far more hours doing actual farm-work. For this reason, husbands' well-being may have had more impact on the couples' financial situation than that of their wives.

Results showed yet another gender difference that may be related to the different roles husbands and wives occupy. Over a ten-year time period, husbands' health complaints were predictive of their wives' health complaints. Vice versa, no long-term crossover effect was found. This latter finding is not consistent with results from previous studies showing the crossover effect to be bi-directional (e.g., Bookwala & Schulz, 1996; Pleck & Staines, 1985; Westman & Etzion, 1995; Westman & Vinokur, 1998). Dyadic processes among farm-couples may explain this difference. First, husbands and wives may react differently when confronted with spousal stress. Farming requires continuous attendance and physical presence, so when the farmer is ill and cannot fulfill his tasks, like feeding the cattle or milking, someone else needs to take over. Indeed, previous research (Giesen, 1991; 1993) has shown that it is common practice for farm-wives to step in when necessary, whereas for farmers it is far less common to take over their wives' tasks (including household-tasks). This would be in line with studies on dyadic adjustment processes (Bolger et al., 1989; Pittman et al., 1996), showing that women tend to react by taking over household tasks to compensate for their spouses' job-stress. Such a

complementary reaction was not found for men. Second, when confronted with stressors, husbands may appeal more strongly to their spouses, as suggested by the findings of a recent study (Jones & Fletcher, 1996). Anecdotal material of our research suggested that husbands indeed shared personal problems mainly with their spouse and – to a lesser extent – with their adult children, whereas wives also shared them with other relatives or friends (Giesen, 1993; Gorgievski-Duijvesteijn & Giesen, 1997). Thirdly, as some researchers have found, women may be more vulnerable to "catching" other peoples' psychological distress, because traditional gender roles may have taught them to be more sensitive to emotions displayed by others. Fourthly, interpersonal stressors may be more relevant to women, and consequently may evoke stronger stress reactions (Hatfield et al., 1994). Indeed, results of a previous farm study showed that social stressors – particularly lack of spouse support –affected farm-wives more strongly than financial stressors (Giesen, Maas & Vriens, 1989, Giesen, 1991). Moreover, another study among farm-couples (Lorenz, et al. 1993) showed that financial problems led to depressive symptoms for both spouses, but this relationship was mediated by lack of spouse support for wives, and by loss of control for husbands. Thus, our results indicate that instead of less strongly, financial problems may farm wives in different ways. Interpersonal processes seem to play a key-factor here.

In sum, our results do show gender differences that are related to the different roles husbands and wives fulfill at the farm. Most importantly, in contrast to farmers' well-being, wives' well-being was found not to affect the financial situation of the farm over ten years of time. Furthermore, the well-being of farm-wives was affected by her husbands' well-being. A plausible explanation for this cross-over effect of impaired well-being is that farmers appeal to their wives in hard times both for practical support as well as emotional support. Our results do not strongly support the contention that financial problems affect farm-wives less than farmers. Instead, financial

problems may affect farm-wives in a different way, namely through social processes.

General Conclusion

The present thesis explores how current restructuring of the agricultural sector, marked by a strong decline in agricultural businesses and insecure financial prospects, translate into a stressful "loss-spiral" for individual farmers and their families: a treadmill of farm decline. Poor financial prospects lead to intentions to quit the business, which in turn impair financial prospects. Additionally, farmers with poor stable mental health may be more vulnerable to get trapped into this treadmill: they experience more financial problems than farmers with better stable mental health. Consequently, they intend to quit their business more often, which over time leads to poorer objective business prospects. Moreover, the farmers' families are also involved in the treadmill. First, a poor financial situation does not only affect farmers' well-being, but also their wives' well-being. Second, (male) farmers' poor mental and physical well-being were found to cross-over to their wives, presumably through interpersonal processes.

Strengths of the research project

This research project has several strengths. First, it is based on two studies with longitudinal designs, because of which we causality and reversed causality between farmers' financial prospects and their well-being could be investigated. Moreover, as the studies used different time lags spanning either two years or ten years, insights were gained in both long-term and short-term reciprocal effects.

Second, this study had as a unique feature that it contained both objective data on the farm's financial situation and subjective experience of

financial problems and well-being from different data-sources. Moreover, the objective financial situation was measured with a well-validated, multi-faceted indicator that captures the complexity of the farm's financial situation. For instance, it not only pertains to the business, but also to the farmer's household. Additionally, it accurately predicts actual farm-closure. This allowed us to minimize possible methodological explanations for the presence or absence of relationships between the objective measure and subjective experiences, such as common method variance when using the same data source (presence) or overlooking significant aspects of the objective financial situation (absence).

Third, our study used advanced structural equation modeling techniques. This allows for testing our hypotheses multi-variately in integrated models. It also provides the opportunity to test whether causal relationships are simultaneous rather than lagged, and vice versa. Finally, unreliability in the measurement of experienced financial problems and well-being are corrected for. Chapter 4 uses even more of the potential of structural equation modeling, by testing a dynamic equilibrium model of mental health complaints (cf. Duncan-Jones et al., 1990; Heady & Wearing, 1989; Ormel & Schaufeli, 1991). This model corrects for high stability in levels of mental health complaints, which are caused by internal, homeostatic processes. This facilitates detecting small effects of external change agents (such as poor objective business prospects) on mental health complaints. Additionally, this model turns out to be an elegant way to gain insight into the role of stable mental health.

Finally, long-term relationships between financial prospects and well-being of farmers and their wives are tested in one integrated structural model. Because of this, the financial situation was indicated by an intersubjective measure, again reducing possible common-method variance. Moreover, an integrated model provides insight into crossover between farmers' well-being and that of their wives, in addition to causal and reversed causal effects between financial prospects and well-being.

Limitations

Our research also has some limitations. First, our separate studies only had limited numbers of measurement moments each. In combination, they provide information on both short-term and long-term relationships between financial prospects and well-being. However, this information was obtained from different people. To get a better understanding of long-term effects, more insight would be needed into the waxing and waning of the financial situation and well-being. Our research could, for instance, not identify a possible group of farmers who had experienced financial problems over a prolonged period of time. Alas, because here may lay the answer to the question why no long-term lagged effect was found of the financial situation on well-being, and in particular physical health. Namely, it is highly unlikely that financial problems that occurred ten years ago, and have been solved long since then, would still affect well-being today. Our sample of Dutch dairy farmers participating in the ten-year follow-up study had been doing relatively well during the time of our study (Landbouw Economisch Instituut - Dienst Landbouwkundig Onderzoek, 1995). Therefore, it seems unlikely that our sample included farmers who had experienced financial problems for ten years, but this remains hypothetical. A long-term longitudinal study containing more measurement moments at different time intervals could fill this gap.

Second, not all topics that were addressed benefited equally from the strengths of our research designs. The role of job-involvement was investigated cross-sectionally (Chapter 2) and farm-wives only participated in our ten-year follow-up study (Chapters 2 and 3). Further long-term investigation of the stress-moderating effect of job-involvement and objective financial prospects is warranted. Additionally, the relationship between the financial situation of the

farm and well-being of farm-wives needs to be investigated in a short-term longitudinal study.

Third, since objective financial prospects were measured with one, albeit multifaceted, indicator, it was not possible to correct for measurement error on this variable. Unreliability in the objective measure leads to artificially lower relationships with subjective outcomes. Therefore, our results may have *underestimated* the true relationships between on the one hand objective financial business prospects and on the other hand experienced financial problems and subjective well-being.

Fourth, our study was not purely based on COR-theory (Hobfoll, 1988; 1989; 2001). To test COR-theoretical principles fairly, such as the "primacy of loss" principle, some adjustments of the design are recommendable. First, our subjective measures of resources – the financial situation and well-being – were negatively formulated, meaning this study mainly focused on "lack of resources". A next study based on COR-theory could benefit from including more positive indicators of resources. Furthermore, from a COR-theoretical perspective, more resources that might be threatened or lost as a result of a poor financial situation could be included to explain causal and reversed causal processes between financial prospects and well-being. Examples are personal resources, such as personal competence, or social resources, such as spouse support (cf. Armstrong & Schulman, 1990; Lorenz et al., 1993).

Finally, our study addressed a specific sample, namely Dutch farmers and to a lesser extent also their wives. This sample has specific features, because of which the question may arise as to whether the results of our study would generalize to other samples, specifically the self-employed in general. An important reason why this might not be the case is that most of the business operators in our sample were male. The dyadic processes described in our study may not apply to female self-employed individuals. Therefore more research

needs to be conducted to replicate our findings, particularly among self-employed women.

Theoretical implications

In spite of its limitations, the present research has some important theoretical implications. First, it offers strong support for a reversed causal effect of well-being, particularly a stable poor mental health and the intention to quit, on the farm's financial situation. This emphasizes that occupational stress-researchers should seriously consider the possibility of reversed causation. Reversed causal effects should definitely be included, if respondents can be assumed to influence the occurrence of the stressor under consideration, as were financial prospects in our sample of self-employed individuals. Additionally, reversed causal effects may be particularly important in the long-term. As our study showed, impaired mental health had a constant negative influence on farmers' perception of the situation, which led to withdrawal and diminished motivation. Even though such an effect may be modest in the short term, in the long term it may become substantial. Moreover, the processes explaining reversed causation need to be investigated, for instance, via the effect of well-being on performance (e.g., Jex, 1998; Sonnentag, 2002; Wright & Cropanzano, 2000) or social behavior (Vinokur et al., 1996).

Second, our findings show that objective financial prospects and experienced financial problems behaved differently in the stress-process, especially longitudinally. This merits the use of objective stressors as separate antecedents in the stress-process, in addition to subjectively experienced stressors, since it adds to our understanding of the stress-process. In some cases, researchers may particularly be interested in the effect of objective aspects of the work environment on employees' well-being. However, with a view to *understanding the stress-process*, the use of objective indicators of stress is

not favored *over* subjective experience, discarding subjective experience as more fallible indicators of the stressor. Furthermore, the relationship between objective stressors and subjective experience deserves more attention in stress-research in general, and COR-theory in particular. In line with current transactional stress-approaches, the results of this study indicate the perception and experience of stress is the result of a transaction between person and environment. However, much of this transactional process has yet remained unknown.

Third, the application of a dynamic equilibrium model was proposed to *all* resources, not only to mental and physical health (Chapter 5), as an alternative way to test causal and reversed causal relationships between stressors and well-being. This leads to additional insights that may be helpful in further developing COR-theory. First, it shows that there are different kinds of resources, based on the extent to which they have stable baseline levels. Additionally, it reveals two different "vulnerability" mechanisms. First is the well-elaborated negative "loss-spiral": a loss of resources may cause individuals to become more vulnerable for further loss. Second is a static process, causing some people with stable poor levels of a particular resource (in our study mental health) to be more vulnerable of getting into the "loss-spiral". This second process has received limited attention in COR-theory. Understanding how resources can be used to protect, maintain, and increase other resources, also includes understanding what resources help people making the right choices concerning how to invest their resources effectively.

Practical Implications

Our research has practical implications for policy-making, individual farmers and professionals who regularly work with farmers. These will be outlined below.

Implications for policy-making

The European Union and the Dutch national government aim at stimulating innovation processes in the agricultural sector. In doing so, they should not lose sight of the fact that individual farm-families eventually must make the change. Ongoing structural innovations in European Agriculture in the past 50 years have required an ongoing adjustment of farm business. This thesis shows that there is a real danger that farmers lose their motivation for farming and get caught into the stressful treadmill of farm-decline. So, the question as to whether the implementation of new legislation would go beyond the adaptation resources of individual farm-families is significant. The EU and the Dutch Government are concerned with this question. Therefore, before implementing new regulations, they regularly ask economists of for instance the Agricultural Economics Research Institute to calculate possible (objective) financial consequences for farmers. However, a one-sided economic approach that does not include the subjective perceptions of farmers is inadequate. Therefore, policy-makers should additionally take into consideration the subjective "translation" of possible objective financial consequences, in other words, the possible *experienced* consequences of their legislation. As this thesis showed, subjective experience is a far better predictor of farmers' future intentions concerning farming and eventually well-being.

One possibility to obtain information on psychological consequences would be to conduct surveys and ask farmers directly to indicate what possible consequences they think the new legislation would have for themselves and their business. However, this would increase bureaucracy considerably for both policy-makers and farmers. A better solution would be to monitor experienced financial problems along with the objective financial administration in the FADN. To date, no predictive models exist yet for experienced financial problems. Monitoring experience financial problems, and some relevant psychological variables such as the intention to quit and mental health, together

with the financial administration provides the opportunity to develop such models. The model developed in the present thesis could be used as a starting point. Besides, these data can also be used for evaluating effects of policy afterwards.

Implications for Farmers

It is important that farmers have sufficient resources to react adequately to the demands of current farm-life. Regularly updating ones knowledge to meet the required standards concerning management, technical, administrative or financial issues is therefore common practice for most farmers. However, initiatives to provide farmers and their families with insights into psychological aspects of their functioning are still limited. Given the causal link between well-being and the financial situation of the farm business, psychological aspects should receive more attention, for instance, at meetings and courses arranged by agricultural associations or in trade journals.

Based on our results, the following topics seem of particular importance. First, farmers may need to become aware of the way personal differences, such as a high job-involvement and poor stable mental health, influence farmer's functioning and the consequences this may have for their well-being and the success of their business. Second, as the stressful process of declining farm business characterizes contemporary agriculture, insight into psychological aspects of this process is no luxury. Farmers may be stimulated to reflect upon their motivations to be in farming. If they may get confronted with declining prospects, this may help them weigh the costs and benefits of continuing or quitting the farm business. When facing poor prospects, both decisions are likely to be stressful, but being on the wrong track will lead to unnecessary losses and pain. Finally, at the farm, work and home are closely intertwined. Good farmers realize how the farm affects their family and what

their family means to their farm. Increasing farmers' insights into dyadic and family processes may therefore help them (and their families) farm in a more satisfying and effective way.

Implications for Advise and Counseling

Our results show that farmers' subjective experience is far more important as a predictor of both farmers' intentions regarding future farming and mental health than objective financial prospects. This implies that professionals advising farmers concerning financial, economic issues, such as bank-employees or bookkeepers, should not ignore psychological and social processes. Our results emphasize the importance financial experts communicate clearly what financial economic indicators mean, and discuss possible implications of the financial situation for future prospects of the business and the family. To farmers, the figures may not speak for themselves. Moreover, farmers' actions are based on their subjective experience of their financial situation rather than on objective figures. Therefore it is important to know how farmers experience their financial situation, in addition to looking at the objective figures.

For social workers, our research showed some concrete points of attention. Our study revealed two groups of farmers that may be particularly vulnerable to impaired well-being in the face of poor financial prospects, and possibly farm-stress in general. First, farmers with high job-involvement were shown to worry more about the farm than less involved farmers, particularly when facing financial problems This is a possible risk factor for developing more generalized and long term mental and physical illness. Second, farmers with poor stable mental health experienced more financial problems than those with good stable mental health, over and above the effect of objective financial prospects, which in turn became a self-fulfilling prophecy. Cognitive emotional

techniques may be aimed at changing these tendencies into more adaptive ways of coping, which might improve both well-being and the financial success of the business.

Final remark

The present thesis shows that farmers' well-being is key to farm business. The treadmill of declining farm business may not be stopped, but mental health and motivation are important resources that may prevent the individual farmer from getting caught into it. They should therefore be protected and maintained.

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SUMMARY

This thesis aims to contribute to a better understanding of the mutual relationship between farmers' financial prospects and their well-being. Additionally, it investigates causal relationships between financial prospects for continuing the farm business and well-being for farm-wives. The research is conducted against the background of continuous restructuring of the agricultural sector in the second half of the 20th century, which has had far-reaching consequences for individual farmers and their families. Most importantly, many farmers saw the financial prospects of their business decline. Consequently, many farm-families have experienced financial problems.

Qualitative studies have shown how a strong emotional involvement in farming motivates farmers to continue, in spite of severe financial problems and at large emotional costs. Several previous farm-studies have shown relationships between poor financial prospects and impaired well-being, ranging from dissatisfaction to suicide. However, to our knowledge, no studies to date have provided a conclusive answer concerning the causality of these relationships. For this reason, this research was initiated.

The thesis presents the results of two separate studies. One is a ten-year follow-up study on farm stress among Dutch dairy farm-couples that started in 1986 (Giesen, 1991). The follow-up took place in 1996. The second study is a three-wave longitudinal study among a broader sample of Dutch agriculturalists and horticulturalists. This research has been conducted in cooperation with the Agricultural Economics Research Institute (LEI). This provided us with a unique opportunity to obtain information on the objective financial business prospects of the individual farms participating in the study, in addition to self-report data on financial problems and well-being.

The research is inspired by Conservation of Resources (COR) theory, according to which people strive to build, protect and retain their resources.

When people are hindered in this striving, stress is expected to ensue. More specifically, a stress-perception model was tested, according to which poor objective financial prospects "translate" into experienced financial problems. These, in turn, lead to stress-reactions, which may be behavioral (the intention to quit) or pertain to mental and physical health. Furthermore, some individuals are expected to be more vulnerable to experiencing financial problems, or to have increased stress-reactions when experiencing financial problems.

Chapter 2 addresses the question as to whether high (emotional) job-involvement exacerbates a possible negative effect of poor finances on well-being. Results of multilevel hierarchical regression analyses of data obtained in 1996 from 107 Dutch dairy farm-couples show partial support. A high job-involvement strengthens the relationship between experienced financial problems and job-related worrying. Additionally, both highly involved farmers and farm-wives tend to worry more about their farm in general than less-involved farmers and farm-wives. Worrying may be a risk factor for developing more generalized mental and physical health complaints in the long term. However, job-involvement and mental health complaints were not related in this cross-sectional study. Neither was the relationship between experienced financial problems and mental health stronger for highly involved farm-couples than for low-involved farm-couples. This may be the result of a "floor"-effect. The dairy farm-couples had only few financial problems, which were likely to be recent.

Chapter 3 presents results of a ten-year follow-up study among Dutch Dairy farm couples (N = 91) that investigates long-term causal and reversed causal effects between experienced financial problems and mental and physical (psychosomatic) health for both husbands and wives. Structural equation modeling (SEM) showed that farmers' mental and physical health is an important resource for both the farm and the family. First, it predicted whether the farm-*couple* experienced financial problems over ten years of time.

Additionally, farmers' mental and physical health predicted that *of their wives* ten years later. In contrast, no long-term effects were found of wives' mental and physical health.

The different roles husbands and wives fulfill at the farm are proposed as an explanation of these gender differences. Compared to their wives, the farmers in our study provided more labor at the farm and played a more active role in decision-making. Therefore, they can be assumed to have a bigger influence on the farms' financial situation. The farm-wives in the study were mainly responsible for the family and the household. There are several possible reasons why their husbands' health problems affected farm-wives, rather than that their health complaints affected that of their husbands. When farmers fall ill, wives often take over some tasks at the farm, whereas for farmers it may be less common to take over their wives' tasks when she gets ill. Additionally, farmers share problems mainly with their wives, whereas their wives more often seek support from their friends and relatives. This means farmers' health complaints may impair their wives' health, because it appeals to her resources. Another possible gender difference is the fact that women in general may have better empathic capabilities and are therefore more sensitive to "catching" other peoples' emotions.

The central question Chapter 4 addresses is whether *objective* financial prospects affect farmers' well-being and vice versa, whether farmers' well-being affects their objective financial prospects. This is investigated in a three-wave longitudinal study among 513 Dutch agriculturalists and horticulturalists, spanning two years of time. Using SEM, this study reveals a stressful, negative loss-spiral, the "treadmill of farm-decline". Poor objective financial prospects lead to experienced financial problems, which have negative consequence for farmers' mental health. Especially when experienced financial problems increase, that is, when farmers see their financial situation deteriorate, the negative mental health effect of experienced financial problems intensifies.

Additionally, the more financial problems farmers experience, the more likely they are to intent quitting the business. In turn, a stronger intention to quit the business leads to a further deterioration of the objective financial prospects.

In addition, farmers with a poor stable mental health condition are more likely to get trapped in the "treadmill of farm decline". This is because they experience more financial problems, over and beyond the effect of poor objective financial prospects. Over time this may become a self-fulfilling prophecy, as they are more likely to intent quitting the business, which negatively affects their objective financial prospects. Short-term mental health complaints do *not* predict farmers' objective financial prospects. This contradicts the proposition that the effect of poor financial prospects on mental health may accumulate over time, because impaired mental health that *is the consequence* of poor finances (short-term) would affect objective financial prospects.

Chapter 5 proposes a "dynamic equilibrium model" of resources. This model divides the levels of experienced financial problems and health complaints into stable and variable levels. The stable levels of experienced financial problems and health complaints are assumed to be under the influence of internal, homeostatic processes. External change agents can cause temporary changes in these stable resource levels, represented as variable levels. However, the internal processes will cause them to return to their original stable baselines, a "dynamic equilibrium". Testing a stability and change model for experienced financial problems and health complaints shows that mental and physical health have larger stable components than financial problems.

Additionally, like Chapter 4, Chapter 5 reveals that the mutual relationship between finances and mental health is not completely circular. First, experienced financial problems have a negative short-term mental health effect, if they are more severe than what farmers normally experience (stable level). On the other hand, farmers with poor *stable* mental health were more

vulnerable for experiencing financial problems. Intriguingly, farmers with a poor stable mental health were not more negative *in general* about their financial situation. As it appeared, they were more vulnerable to experiencing negative changes in their financial situation, which in turn made them experience also more short-term mental health complaints.

Chapter 6 summarizes and discusses the major research findings. Additionally, some critical remarks are made on the research design and methodology. Finally, implications for theory and practice are discussed. The general conclusion of this thesis is that farmers' mental health and motivation are major resources for both their farm and their family. Farmers with poor stable mental health are more likely to get caught in the stressful process of farm-decline. This diminishes their motivation, which drives them deeper into it, which has negative consequences for both their own well-being and that of their spouses.

SAMENVATTING

Dit proefschrift geeft inzicht in de wederkerige, oorzakelijke relatie tussen de financiële situatie van agrarisch ondernemers (boeren en tuinders) en hun welbevinden. Daarnaast onderzoekt het oorzakelijke relaties tussen de financiële situatie en het welbevinden van agrarische vrouwen. Dit onderzoek is uitgevoerd tegen de achtergrond van voortdurende herstructurering van de agrarische sector in de tweede helft van de 20e eeuw, welke vergaande gevolgen had voor de individuele boeren en tuinders met hun gezinnen. De belangrijkste was dat veel boeren en tuinders de financiële perspectieven van hun bedrijf achteruit zagen gaan. Dientengevolge ondervonden veel agrarisch gezinnen financiële problemen.

Kwalitatieve studies hebben laten zien dat een sterke emotionele binding aan het agrarische beroep boeren en tuinders motiveert om door te gaan, ondanks ernstige financiële problemen en tegen een hoge emotionele prijs. Ook kwantitatief onderzoek onder boeren toonde aan dat een slechte financiële situatie verband hield met verminderd welbevinden, variërend van ontevredenheid met het beroep tot zelfmoord. Echter, voor zover wij weten zijn er tot dusver geen studies geweest die de oorzakelijkheid van de verbanden hebben kunnen aantonen. Daarom is dit onderzoek geïnnitieerd.

Dit proefschrift presenteert de resultaten van twee studies. De eerste is een tien-jaar follow-up onderzoek naar stress op het boerenbedrijf onder melkveehouders, dat begon in 1986 (Giesen, 1991). Het vervolg vond plaats in 1996. De tweede studie was een 3-wave longitudinaal onderzoek dat twee jaar besloeg. Deze studie werd uitgevoerd in samenwerking met het Landbouw Economisch Instituut (LEI). Door deze samenwerking hadden we de unieke gelegenheid informatie te verkrijgen over de objectieve financiële situatie van de individuele bedrijven die meededen in onze studie, in aanvulling op de door

boeren en tuinders zelf gerapporteerde gegevens over de mate waarin zij financiële problemen ervoeren en hun welbevinden.

Ons onderzoek is gebaseerd op de “Conservation of Resources” (behoud van hulpbronnen) – Theorie, die stelt dat mensen ernaar streven hun hulpbronnen te vergroten, te behouden of te herwinnen. Als mensen in dit streven worden geremd, zou stress ontstaan. Meer specifiek is er een stress-perceptie model getoetst. Volgens dit model vertalen slechte objectieve financiële perspectieven voor het bedrijf zich in de mate waarin agrarisch ondernemers financiële problemen ervaren. Deze ervaren financiële problemen zouden leiden tot stress-reacties. Dit kan bijvoorbeeld gedrag zijn (terugtrekken, de intentie om te stoppen) of lichamelijke en psychische gezondheidsklachten. Verder is de verwachting dat sommige mensen kwetsbaarder zijn dan anderen om financiële problemen te ervaren, of meer klachten te ervaren naar aanleiding van financiële problemen.

Hoofdstuk 2 onderzoekt de vraag of een sterke emotionele betrokkenheid de relatie tussen financiële problemen en verminderd welbevinden versterkt. Hiërarchische regressie-analyse op de data van 107 boeren en boerinnen uit de melkveehouderij die meededen in de tweede meting van de 10-jaar follow-up leverde gedeeltelijk bewijs. Een sterke emotionele betrokkenheid versterkte het verband tussen financiële problemen en piekeren over het werk. Bovendien piekerden sterk betrokken boeren en boerinnen sowieso meer over problemen op het bedrijf dan minder betrokken echtparen. Piekeren vergroot het risico op gegeneraliseerde lichamelijke en psychische klachten op langere termijn. Uit deze cross-sectionele studie bleek echter niet dat betrokkenheid verband hield met psychische gezondheid. Ook was het verband tussen financiële problemen en psychische klachten niet groter voor sterk betrokken dan voor minder betrokken echtparen. Dit kan het resultaat zijn geweest van een “bodem”-effect. De melkveehouders hadden weinig financiële problemen, en als zij die hadden, waren zij waarschijnlijk recent.

Hoofdstuk 3 presenteert de resultaten van een tien-jaar follow-up studie onder boeren en boerinnen in de melkveehouderij (*N* = 91) die lange termijn oorzakelijke verbanden onderzocht tussen ervaren financiële problemen, en psychische en lichamelijke (psychosomatische) gezondheids-klachten voor zowel mannen als vrouwen. Structurele vergelijkingsmodellen (SEM) lieten zien dat de psychische en lichamelijke gezondheid van boeren een belangrijke hulpbron is voor zowel het bedrijf als het gezin. Op de eerste plaats voorspelde het of het *echtpaar* tien jaar later financiële problemen zou ervaren. Daarnaast voorspelde de lichamelijke en psychische gezondheid van de boer de gezondheid van *zijn vrouw* tien jaar later. De gezondheid van de vrouw had daarentegen op lange termijn geen effecten.

De verschillende rollen die mannen en vrouwen vervullen op het boerenbedrijf wordt als verklaring gegeven voor dit sexeverschil. Vergeleken met hun echtgenotes leverden de boeren in de studie de meeste arbeid op het bedrijf en speelden zij een actievere rol in de besluitvorming. Daarom kan verwacht worden dat zij een grotere invloed hadden op de financiële situatie van het bedrijf. Er zijn verschillende redenen waarom de gezondheid van de man de gezondheid van de vrouw beïnvloedde en niet andersom. Als boeren ziek worden, nemen vrouwen vaak taken over voor het bedrijf, terwijl het voor mannen veel minder gebruikelijk is om taken van hun vrouw over te nemen als zij ziek wordt. Daarbij delen boeren hun persoonlijke problemen voornamelijk met hun vrouwen, terwijl vrouwen vaker steun zoeken bij hun vrienden en andere familieleden. Dat betekent dat de gezondheidsklachten van mannen de gezondheid van hun vrouwen kan schaden, omdat het een appèl doet op haar hulpbronnen. Een ander mogelijk sexeverschil is dat vrouwen over het algemeen wellicht meer empathisch vermogen hebben en daarom meer kwetsbaar zijn om “besmet te raken” met andermans emoties.

De centrale vraag van Hoofdstuk 4 is of *objectieve* financiële perspectieven de gezondheid van agrariërs beïnvloeden en, vice versa, de

gezondheid van agrariërs hun objectieve financiële perspectieven. Dit is onderzocht in een drie-wave longitudinale studie onder 513 boeren en tuinders, dat twee jaar tijd bestreek. Met behulp van SEM werd een stressvolle negatieve "verlies-spiraal" blootgelegd, de "negatieve spiraal van geld en gemoed". Slechte objectieve financiële perspectieven leiden tot ervaren financiële problemen, die negatieve consequenties hebben voor de psychische gezondheid van de agrarisch ondernemer. Vooral wanneer de ervaren financiële problemen toenemen, dat wil zeggen, als boeren hun financiële situatie zien verslechteren, versterkt dit het effect op de psychische gezondheid. Daarbovenop leiden ervaren financiële problemen tot een sterkere intentie om het bedrijf te beëindigen. Omgekeerd leidt een sterkere intentie tot bedrijfsbeëindiging tot een verdere verslechtering van de objectieve financiële perspectieven.

In aanvulling hierop hebben boeren met een slechtere stabiele psychische gezondheid een grotere kans om in de negatieve verlies-spiraal terecht te komen. Dit komt doordat zij meer financiële problemen ervaren dan verwacht kan worden op basis van hun objectieve financiële perspectief. Over tijd kan dit een zichzelf vervullende voorspelling worden, aangezien zij vervolgens een sterkere intentie hebben om het bedrijf te beëindigen, hetgeen weer negatieve gevolgen heeft voor de objectieve financiële perspectieven van het bedrijf. Korte termijn psychische klachten voorspelden de financiële situatie *niet*. Dit gaat in tegen het idee dat het effect van een slechte financiële situatie op psychische klachten zou accumuleren over tijd, doordat psychische klachten *die het gevolg* zijn van een slechte financiële situatie (korte termijn) de financiële situatie verder zouden verslechteren.

In Hoofdstuk 5 wordt een "dynamisch evenwicht"-model van hulpbronnen voorgesteld. Dit model verdeelt de niveaus van ervaren financiële problemen en gezondheidsklachten in een stabiel niveau en variabele niveaus. De stabiele niveaus worden verondersteld onder invloed te staan van interne, homeostatische processen. Externe invloeden kunnen tijdelijke veranderingen

veroorzaken in de stabiele niveaus, hetgeen zich uit in variabele niveaus. Echter, de interne processen zullen die niveaus weer naar hun oude, stabiele basis-niveau terugbrengen: een "dynamisch evenwicht". Als het "dynamisch evenwicht" – model getoetst wordt voor financiële problemen en gezondheid, blijkt dat lichamelijke en psychische gezondheid een grotere stabiele component hebben dan financiële problemen.

Daarnaast toont hoofdstuk 5, net als Hoofdstuk 4, dat de relatie tussen de financiële situatie en gezondheid niet helemaal rond loopt. Ten eerste blijken financiële problemen (variabel niveau) op korte termijn een negatief effect te hebben op de psychische gezondheid, als zij ernstiger zijn dan wat agrariërs gewend zijn (het stabiele niveau). Aan de andere kant zijn boeren met een slechtere stabiele psychische gezondheid kwetsbaarder om financiële problemen te ervaren. Bijzonder was dat boeren met een slechte stabiele psychische gezondheid niet *in het algemeen* negatiever waren over hun financiële situatie. Zoals bleek waren zij kwetsbaarder voor negatieve *veranderingen* in hun financiële situatie, hetgeen ook weer tot meer psychische klachten leidde op de korte termijn.

In Hoofdstuk 6 worden de belangrijkste bevindingen samengevat en bediscussieerd. Daarbij worden een aantal kritische kanttekeningen geplaatst bij het gehanteerde onderzoeksdesign en methodologie. Tenslotte worden implicaties voor theorie en praktijk gegeven. De algemene conclusie van dit proefschrift is dat de psychische gezondheid en motivatie van agrarisch ondernemers zeer belangrijke hulpbronnen zijn voor zowel hun bedrijf als hun gezin. Agrariërs met een slechte psychische gezondheid hebben een grotere kans terecht te komen in de stressvolle verliesspiraal van bedrijfsbeëindiging. Dit vermindert hun motivatie, waardoor zij dieper in de problemen geraken. Dit heeft negatieve consequenties voor zowel hun eigen welbevinden als dat van hun partners.

NAWOORD

Dit proefschrift onderzoekt de relatie tussen de financiële positie van het bedrijf en het welbevinden van agrarisch ondernemers. Eén van de belangrijkste conclusies uit dit onderzoek is dat een positief gemoed een belangrijke hulpbron is die bijdraagt aan succes op het professionele vlak, maar ook aan het welbevinden van andere gezinsleden. Het bevreemde mij dat we dat in onze studie voor agrarische vrouwen niet vonden.

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CURRICULUM VITAE

Marjan Gorgievski-Duijvesteijn is geboren op 24 januari 1968 te Bleiswijk, ZH. In 1986 behaalde zij haar Atheneum diploma aan het St. Laurenscollege te Rotterdam. In september datzelfde jaar begon zij aan haar studie psychologie te Leiden. In 1992 studeerde zij af, met als afstudeerrichtingen Sociale en Organisatie-Psychologie, alsmede Klinische en Gezondheidspsychologie.

Tot november 1995 heeft zij verschillende tijdelijke functies vervuld. Zo analyseerde zij als junior onderzoeker bij de vakgroep Vrouwenstudies te Leiden de functie-profielen van gezinsverzorgsters en alfa-hulpen in de thuiszorg. Voor het Arbeidsbureau Scheepvaart lichtte zij het bestand van werkzoekenden door en voerde gesprekken met langdurig werklozen i.v.m. mogelijkheden tot omscholing of bijscholing. Verder verzorgde zij onderzoeksondersteuning voor B&A groep Beleid en Advies te Den Haag.

November 1995 streek zij voor langere tijd neer in Utrecht. Tot november 1996 werkte zij als junior onderzoeker bij de vakgroep Klinische en gezondheidspsychologie van de universiteit Utrecht, alwaar zij voor het ministerie van LNV onderzoek deed naar de reden waarom boerenechtparen stoppen of doorgaan met hun bedrijf. Per 1 januari 1997 werd zij aan de Universiteit Utrecht aangesteld als assistent in opleiding bij Sociale en Organisatiepsychologie en de Onderzoeksschool voor Psychologie en Gezondheid (P&H). Daar verrichtte zij longitudinaal onderzoek naar de relatie tussen financiën en gezondheid van agrarisch ondernemers. Verder volgde zij de P&H AIO-opleiding, verzorgde onderwijs en was afgevaardigde van de P&H promovendiraad in het bestuur van de P&H onderzoeksschool. Sinds 1 juni 2002 is zij werkzaam als universitair docent aan het Instituut voor Psychologie van de Erasmus Universiteit te Rotterdam.