The interaction between explicit and implicit strategies for behaviour

Research Programme Psychology 2008 – 2013

Open University of the Netherlands

October 2010
The interaction between explicit and implicit strategies for behaviour

1. OBJECTIVES AND RESEARCH AREA

MISSION
The mission of the programme is to study the interaction between explicit and implicit strategies for behaviour in some of the key fields of human behaviour. In psychology we observe a discrepancy between explanations (and consequent interventions) that persons have explicit reasons, explicit plans, strategies, regulations etc. and that can act accordingly, versus explanations (and consequent interventions) that suppose humans to have no insight in motives, causes, strategies for their behaviour. This might reflect theoretical gaps or controversies in psychology; it might also reflect a fundamental polarity in human beings, leading to complementary or conflicting sources for behaviour regulation. More specifically, the programme aims to address (1) which explicit and implicit strategies for behaviour people use across a diversity of situations, (2) how people deal with the interaction between the explicit and implicit action strategies involved, (3) how much room there is for change of behaviour strategies in the diversity of situations that people come across, and (4) how human environments can be (re)designed to release discrepancies if necessary.

OBJECTIVES
The programme is in the start-up phase. The time available for research is restricted to 20% of the time available for academic staff in the faculty (including those without a research assignment). Therefore, although the objectives are ambitious, achieving them takes time. Quantitatively speaking, in the past most individual members of staff have contributed substantially to the department’s research output. Some groups had been created, some aggregations can be discerned, now the time has come to join forces. The management makes some more time available for research (more than the ordinary 20%) when one or more members can be expected to reinforce the programme in accordance with the intended focus, to enlarge external funding, and/or to strengthen its empirical or theoretical basis. There is a limit to this: the total amount of available time for researchers (in 1st money stream) is 20% of the total amount of academic fte of the department. The 20% is taken seriously and is monitored yearly.

The programme management’s first aim is to achieve more convergence and focus in the research activities of the department’s staff, with acknowledgement of existing expertise and distinction in the group. This must result in on the one hand a coherent programme that on the other hand unifies at least 90% of the department’s publications output.

Another objective is to make the interlace between research and teaching stronger. No longer is teaching leading in research. Research activities can reinforce teaching as well. Especially where research for Bachelor and Master Theses are involved, the participation of students in teachers’ research activities can be stimulating. Publishing by teacher in cooperation with students is stimulated and indeed a fact.

A third objective is to integrate Life Long Learning aspects in the research areas. 25 percent of the publications must be accepted as LLL- related by NeLLL.
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Quantitatively, the department will focus this period on three international publications per fte per year.

RESEARCH AREAS

The programme is designed to stimulate research that connects with the aims of the Open University’s educational and research focus, life long learning¹, and learning in a knowledge society, and the expertise in the department’s teaching programme:

- Evolution of behaviour strategies, especially in partner selection and the consequences of aging
- Health psychology, especially prevention and coping with (chronic) disease
- Clinical psychology, especially early detection and prevention of psychiatric disorders
- Social, organisational and human resources psychology, especially the social exchange behaviour
- Life long learning, especially revision and change of implicit strategies in professional and personal development related to health, mental health, fairness in institutions.

2. Composition

STARTING DATE AND COMPOSITION OF THE PROGRAMME

The present programme started at the moment the Open University’s research mission changed from innovation oriented research to basic and applied research as conducted at the other, regular Dutch universities, that is, at January 1, 2008. To some degree this is accompanied by a change in financial support. Although the staff of the psychology department had been doing research on an individual basis (cf publications 2002-2009), the importance of joining forces in a coherent programme is clear.

The result of the first five years period of programme development should be a programme that can be evaluated by an external party, and that is considered to offer a valuable contribution to the growth of psychological knowledge in the areas mentioned above and discussed in following sections.

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¹ The Open University of the Netherlands’ activities on research on Life Long Learning are clustered in the Netherlands’ Laboratory for Life Long Learning (NeLLL)
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**MANAGEMENT**

Prof. dr. R. van Hezewijk (programme leader)

and the Faculty’s Research Committee

Dr. N. Jacobs

Prof. dr. L. Lechner

Dr. A. Mudde

Dr. M. Nijkamp

Dr. J. van Ruysseveldt

Dr. J. Syroit

**National and international position**

At present several faculty members are affiliated with national research schools. The situation concerning research schools, however, is unclear. Some schools are local, some are national. A list of affiliations is attached to this document. Cf attachment *Lijst van affiliaties 2009*

Depending on the topic, relevant cooperation partners for research teams of the faculty's research programme have been or will be established. Some are involved in research, others will be invited when relevant for the research theme of a team. At present members of the department cooperate with members of Erasmus University Rotterdam, Tilburg University, Utrecht University, Maastricht University, Radboud University Nijmegen, and the University of Groningen, as well as the Free University of Brussels, and the Catholic University of Leuven, The University of Gent, the Ministry of Defense of Belgium, ....

Cooperation has also been established with institutions for health or mental health in the Heerlen region (euregion).
Members of the programme also cooperate with other research groups and programme members of the Open University, especially CELSTEC and NELLL, and outside of the Open University, such as Caphri, ICO, and other research schools. The Ph.D. programmes will participate in the OU Graduate School.

Members of the programme lead or participate in Editorial Committees and Editorial Boards of international journals, Scientific Boards etc; see List of affiliations.

The faculty shares it's required ethical committee with the ethical committee of EUR and CELSTEC. One of each committee’s members is “exchanged”.

### 3. Research Programme

**CONTEXT OF THE PROGRAMME**

Psychology offers a vast amount of perspectives on persons as, on the one hand, the apparent "victims" of a necessity or urge to automatically act in a certain way; and on the other hand as persons capable of wilful, self-determined action – as the apparent “suspect” of his behaviour. Psychologists may point out how much of human behaviour complies with implicit -- or automatic, unconscious, involuntary, unintentional – rules. Nevertheless, the profession has prospered thanks to counselling, advice, and other kinds of intervention in personal affairs as well as organisational contexts, parasitizing on the alleged intentionality of our actions. Moreover, most people will report strong convictions about the conscious decisions they made to act in certain ways. In sum, the paradox is that human behaviour is law-like yet volitional (e.g. Gigerenzer, 2008b; Ryan & Deci, 2004; Wegner, 2002).

One way to deal with the paradox is to discard one of both views and retreat to the commitment of one of them, leading to the controversies of the discipline. In the history of psychology, we have seen many examples, the most significant of which where the research programmes of behaviourism and of phenomenological psychology. Another is to suppose neither is wrong and to find out where and when these views are fruitful and how the supposed mechanisms interlace. Depending on background, context, level of analysis or domain the (self-) determination could be a matter of degree. Rules can contradict or reinforce each other, so there can be tension, indifference, mutual support, and reinforcement between implicit and explicit strategies for behaviour.

The paradox, and the way it often is dealt with in psychology, can be confusing for professionals focussing on sustainable interventions. On an abstract level, the fields of interest mentioned above offer instances of domains of behaviour in which the questions emerge that need to be answered: How do human beings adapt their behaviour in specific situations, how can behaviour change be evoked, and in what way can human environments be (re)designed to promote change. For instance, some people constantly feel the tension between (explicit) advise to eat low fat food and to engage in frequent physical activity on the one hand, and the (implicit, perhaps innate) urge for gathering high-calorie resources and saving energy. Mutual reinforcement can be found in tying up the implicit
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strategy for competition with the (explicit) advice to exercise bodily motion, i.e. by introducing sports matches in school.

Whether much of our behaviour is automatic or not, daily experience suggests that there is always room for intentions and interventions. We intend to walk the dog in a minute or two; we decide to stop smoking (in a year or two). However, daily experience is not sufficient as evidence. In the present programme, we want to know how explicit and implicit strategies relate, how they are experienced and how they may help or impede the improvement of la condition humaine.

The terms implicit-explicit were chosen after ample discussion and considerations. Reber (1989, p. 219) already observed that “the term implicit learning was first used to characterize how one develops intuitive knowledge about the underlying structure of a complex stimulus environment (Reber, 1965, 1967). In those early writings, [Reber] argued that implicit learning is characterized by two critical features: (a) It is an unconscious process and (b) it yields abstract knowledge. Implicit knowledge results from the induction of an abstract representation of the structure that the stimulus environment displays, and this knowledge is acquired in the absence of conscious, reflective strategies to learn (p. 219). ...The kinds of operations identified under the rubric of implicit learning represent the epistemic core of intuition. Intuitions are those processes that have emerged in the studies of implicit acquisition of complex knowledge. Perhaps the most compelling aspect of intuition, and the one most often cited in the various definitions that have been given ... is that the individual has a sense of what is right or wrong, a sense of what is the appropriate or inappropriate response to make in a given set of circumstances, but is largely ignorant of the reasons for that mental state” (p.232; our emphasis).

Greenwald and Banaji, discussing implicit social cognition suggest that (1995, pp. 4-5) “the terms implicit-explicit capture a set of overlapping distinctions that are sometimes labeled as unaware-aware, unconscious-conscious, intuitive-analytic, direct-indirect, procedural-declarative, and automatic-controlled. These dichotomies vary in the amount and nature of implied theoretical interpretation. ... The signature of implicit cognition is that traces of past experience affect some performance, even though the influential earlier experience is not remembered in the usual sense—that is, it is unavailable to self-report or introspection“. Together with the “standard heuristic in evolutionary biology that older primitive systems are more robust and resistant to insult than are newer, more complex systems [and] “that the implicit cognitive processes are the functional components of [...]evolutionarily older, primitive system[s] that [...] show greater resistance than [...] explicit processes” (Reber, 1989, p. 232) it can be predicted that these unremembered implicit processes and explicit processes have complex interrelations.

THEORETICAL FRAMEWORK
Niko Tinbergen expressed the basic interest in the subject of the present programme very well: "Because we human beings like to believe that our own behavior is entirely guided by insight or knowledge ... –a widespread fallacy due to overestimation of reason—the spectacle of behavior going wrong impresses and puzzles us." (Tinbergen, 1952, p. 1)
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In the present programme, the implicit-explicit terminology is used because of its prominence in recent research, because of the fruitfulness in bringing together several perspectives on strategies humans apply in regulating their behaviour, and because of the flexibility with which the terms can be applied in different aggregation levels. Researchers make use of the above-mentioned theoretical notions and concepts, as well as other theories that are relevant to improve the explanations of behaviour regulation in the contexts of health, psychopathology, social exchange, and learning. They apply various psychological methods (experimental and quasi-experimental designs as well as survey designs, observation studies or theoretical analyses) to test the effectiveness of hypotheses and interventions, in order to help to understand and define the relation between implicit and explicit behaviour strategies. Quoting Greenwald and Banji again, there is explicit awareness that

To the extent that implicit cognition differs from self-reportable (conscious or explicit) cognition, direct measures—that is, measures that presume accurate introspection—are necessarily inadequate for its study. Rather, investigations of implicit cognition require indirect measures, which neither inform the subject of what is being assessed nor request self-report concerning it. [...] When used ... to minimize reactivity, indirect measures are empirically desirable but not theoretically essential. By contrast, in studying implicit cognition, indirect measures are theoretically essential (Greenwald & Banji, 1995, p. 5).

Thus, for a first approximation, we consider a certain strategy for behaviour as explicit when the subject (the actor) can produce or understand in one way or another his/her strategy as text, as a rule that has been or can be expressed in his/her own words. A strategy is implicit when it is shown to influence a persons action without the person being able to express the rule, or even that there is a rule regulating behaviour (that is, without the help of reading about it in a scientific analysis).

The programme focuses on applications of psychological knowledge in a number of areas, including health, psychopathology, social and cognitive psychology (learning), as well as tries to find the "deeper" foundations of (the interaction between) explicit and implicit strategies and regulations of behaviour. Provisionally, for the sake of clarity, the following characterization is used: an implicit strategy, cognition, rule, attitude, memory etc. is the “... introspectively unidentified, unidentifiable, or inaccurately identified trace of past experience” [or evolution] that mediates actions (categories of responses such as judgements, decisions, actual behaviour) (Greenwald & Banaji, 1995, p. 5).

A strategy to regulate behaviour is a set of rules an individual uses to act, that is, to continue or change his/her own behaviour. Rules can be implicit (or explicit) as personal rules or social rules (i.e. in organizations, ad hoc groups) or even rules that characterize behaviour of a species (i.e. the human species). In this sense, aggregation levels are involved. The perspectives from which we view human behaviour may be broader than usual in psychology. We explicitly are interested in the view of human behaviour and its regulation in light of its evolution

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2 To prevent misunderstanding: whenever in the programme we speak of "strategy" (or "strategies") what we imply is "strategy for behaviour"; when appropriate we will use the phrase "intervention strategy" when we intend to mean a programme of policies by political, therapeutic, or other institutions to stimulate or change behaviour. Thus, an "explicit strategy to regulate health related behaviour" is a set of rules an individual uses to change his/her own behaviour. An
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The research programme for the next five years focuses on the interaction between explicit and implicit behaviour regulation and strategies of behaviour. The hard core of the programme is:

- Behaviour is initiated and regulated by implicit and explicit strategies for action
- A strategy is a determination of and choice between alternative actions that an individual usually takes in certain situations. An implicit strategy is a strategy that one is not aware of; an explicit strategy is a strategy that one is aware of.
- Implicit and explicit strategies can overlap and contradict or enhance each other
- When explicit strategies are chosen that conflict with alternative implicit strategies this creates tension
- Implicit and explicit strategies can reinforce each other, and therefore enhance opportunities to attain explicit goals
- Implicit and explicit strategies can be observed on several aggregation levels: intrapersonal, interpersonal, group, organization, biological (i.e. species level there by feeding forward to intrapersonal level)
  - If strategies are observed to be on the interpersonal, group or organizational level they are to be observed as implicit or explicit strategies (or rules) in two or more persons at the intrapersonal level
- Implicit strategies of behaviour may
  - have phylogenetic origins and thus be the result of innate causes
  - have ontogenetic origins and thus be the result of learning, habits, conditioning, etc.
  - be the product of the interaction with the environment
  - be the result of the interaction with other persons (with the same implicit or explicit behaviour strategies )
  - have implicit functions on personal, social and biological levels
- Explicit strategies of behaviour
  - are the result of rational considerations
  - or are prescribed courses of actions based on rules or regulations, laws etc.
  - or are based on accepted external advise, counselling, evidence etc.
  - or are educated guesses and evidence based prescriptions
  - or have explicit aims on personal or group levels
  - or result from education and pedagogical measures
  - and have implicit functions on personal, social and biological levels
- Strategies can be explicit for one person and implicit for another person
- Strategies can be explicit at one time and (become) implicit at another time (e.g. habits)

RELEVANCE OF THE PROGRAMME

The present programme was designed to contribute to the solution of the paradox sketched above. At present, in psychology we see approaches suggesting humans are rational beings that explicitly decide to behave in a certain way, based on explicit plans, intentions, reasons and other cognitive elements. Perhaps this is the most fruitful approach in certain areas of human action. We also see approaches that point out (often experimentally) how inadequate humans are in planning their behaviour and acting accordingly, in knowing the causes or motives for their behaviour (and why they did not, comply with their own intentions). With our studies we want to suggest that to a

“intervention strategy to regulate health related behaviour” is a policy an institution has to change the environment in order to reduce illness and improve general health (e.g. by changing one of the important determinants of health, income and social status, in relevant groups). Although the use of “implicit” in combination with “strategy” may sound strange for some psychologists, we nevertheless persevere in using strategy for any guideline for behaviour, implicit or explicit. The life sciences abound with this use of “strategy”, even for organisms as diverse as ants and viruses.

What this means is that implicit and explicit strategies for behaviour can emerge or have emerged in a group such that the members of the group all follow them when in the presence (virtual or real) of members of the group (≥ 2), and not outside the group (Douglas, 1999).
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certain degree the paradox can be solved, for instance by taking into account the context and the
nature (first or second nature, for instance) of the behaviour needed or wanted. This might help
professionals and researchers to deal with the apparent paradox discussed above.

More concretely, we aim to study the relation between explicit and implicit strategies for behaviour
for a number of relevant research fields. The fields reflect urgent matters in daily life: sex, health,
social exchange, psychopathology and (lifelong) learning. For every field of interest research is
directed by a number of basic questions that conclude every of the subsections now to be discussed
briefly⁴.

**Evolutionary foundations of behaviour**⁵

A research programme focusing on explicit and implicit behaviour strategies and the interaction
between them is aided by a focus on evolutionary foundations of behaviour. As any other species,
humans are, after all, the product of a long evolutionary history. The results of this phylogenetic
process is a set of adaptive, but mostly implicit behaviour strategies and predispositions, anchored in
the genes waiting for environmental cues to come to an expression that matches the environmental
demands.

During ontogeny these predispositions are transformed into specific dispositions as we interact with
our environment. With regard to human behaviour, these dispositions can be described as strategies
for behaviour, both on a biological and a psychological level. That is, some Evolutionary Stable
Strategies (ESS) on the phylogenetic level result, because of tuning during ontogeny, in behaviour
strategies that result in higher probabilities of survival on an individual level. Because of this, the
tuning of human behaviour has become more and more flexible, enabling regulation of behaviour in
widely differing circumstances, that evolutionary speaking are often "unforeseen".

Our research in this field has a twofold focus. We explore (and expand), first, the four biological
"why’s" Niko Tinbergen formulated that biologists use to explain animal behaviour (Tinbergen, 1952).
In order to find the foundations of human behaviour, we try to formulate a (more) general model of
human behaviour that is grounded in his theory. However, we expand it to allow for the emergence
of socially tuned behaviour and to be able to ask about the interaction between implicit and explicit
strategies for behaviour. This facilitates, secondly, focusing on the explanation of behaviour in some
of the most important areas of life. The areas are the biological, social and cultural aspects of sexual
behaviour, prevention in health related issues, the continuity view of psychopathological symptoms
in issues of mental health, explicit and implicit guides in social exchange, and the lifelong learning
that leads to habits, routines and implicit normativity. We try to discern explicit and implicit
strategies that people use in these areas. Our aim is to have the approaches mutually capitalize on
each other, with the theoretical approach plotting possible courses for research and the empirical
work being a critical check on the theoretical work.

As a closely related illustration of the theory, we focus on sexual behaviour. On the one hand, there
seems to be a very strong and obvious relation with the biological function of sex; on the other hand,
human beings have explored a diversity of cultural expressions of the biological foundation of sex.

⁴ In the supplement every field is discussed in details, and provided with all the relevant references.
⁵ See the section Life Long Learning in the supplement, below, for more details
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Especially in the second half of life (as projected), this leads to interesting interactions, if not tensions. This demands for more attention, not only because of the proportional increase of the ageing population.

With respect to evolutionary foundations of behaviour the questions addressed here are:

- What “sources” for implicit and explicit strategies are there? Especially, how do implicit, biologically originating strategies in partner selection interact with cultural, sometimes more explicit, norms for behaviour in the relation between the sexes?
- Depending on their “sources”, how do implicit and explicit strategies affect each other? More precisely for sexual behaviour: how do implicit drives and explicit social norms for court making relate to each other? Can the second ones be deduced form the first? Do the second ones stimulate the first?
- How do implicit behaviour strategies formed during ontogeny relate to “older” strategies acquired during evolution? Focused on sexual behaviour: are the strategies involved in (e.g.) jealousy “old” or “new”. Are they first or second nature?
- Can implicit and explicit strategies complement each other in behavioural change interventions, and if so, how? Especially: how can explicit cultural, social, dyadic, or individual norms be consolidated by exploiting “older” (implicit) rules?

**Health**

A second field of studies concerns health promotion and the primary prevention of illness, secondary prevention by improving health behaviour leading to early detection of health problems, tertiary prevention in coping with disease and promoting recovery, and patient education and communication. In most theories in health psychology, so-called determinants play a role.

Determinants are all those factors that influence health. For the time being, we consider implicit and explicit strategies to be special cases of determinants. Obviously, intervention strategies often aim at shifting a person’s attention to a more explicit orientation on health related behaviour. In our approach, we focus on the role of both explicit and implicit strategies and -- more generally -- on determinants (and the interaction between them) related to behaviour with an intended or non-intended effect on health. This includes strategies that for the person involved apparently are not related to health issues, yet do affect health in the short or long run.

For the explanation of behaviour and behaviour change we, firstly, focus on testing theories emphasizing explicit strategies, and comparing and combining them with theories emphasizing implicit strategies. However, we also study how these strategies actually or potentially interact with each other and with other non-psychological determinants. As far as health behaviour is age related or phase dependant, we consider for each phase how determinants, especially implicit and explicit strategies, vary. Note that some implicit strategy can aim at or function at quite another domain of behaviour than it has effect. For instance starting to smoke can be part of the implicit strategy of gaining popularity in the group of one’s peers, whereas it eventually has effects on health that are

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6 See [Explicit and implicit strategies for health](#) in the supplement for more details
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unknown or are implicitly taken for granted. Especially in health communication, the results of the cognitive approach based on planning and intentions, is at the limits of explanatory power. Many behaviours remain to be explored that are only indirectly related to health in their functions and intentions (and therefore are cognitively implicit) while they do affect health directly, or in the long run. While making aware one’s implicit strategies (such as habits) is thought to be effective, another approach using non-cognitive strategies might be fruitful. The approaches can vary between changing administrative and general reward systems, and changing implicit associations.

One of the intervention methods often used recently is tailored advice by computer. Especially the recent interest in pda’s, iPod and iPad is promising in bridging the gap between accessibility and mobility. Another approach combining implicit and explicit strategies is entertainment-education (or “edutainment”).

In conclusion, in health psychology, especially where primary, secondary and tertiary prevention are concerned, the following general questions are addressed that provide sufficient guidance for future research and, at the same time, offers continuation with past performance:

- Which determinants, especially implicit and/or explicit strategies for behaviour, are associated with health related behaviour? In addition, are these strategies and their mechanisms different or the same across the continuum of health related behaviour?
- To what extent are these implicit and/or explicit strategies associated with health related behaviour modifiable? Do they reflect “that older primitive systems are more robust and resistant to insult than are newer, more complex systems” (Reber, 1989, p. 232)?
- To what extent are interventions effective in modifying implicit and/or explicit strategies associated with health related behaviour?

Mental Health\textsuperscript{7}

Research in the field of clinical psychology is gradually shifting from a purely categorical syndrome-oriented approach to a dimensional, and even more specific, symptom-oriented approach (e.g. Bentall, 2004). Traditionally, psychopathological symptoms have been considered as features of “mental illness”, which are either present or absent. This dichotomy is inherent in current categorical diagnostic systems, such as DSM-IV and ICD-10. The recently developed symptom-oriented approach has the advantage that it offers a way to investigate the clinical concept without accepting the traditional Kraepelien model. Evidence increases that psychiatric symptoms are not only present in individuals diagnosed with a psychiatric disorder, but also occur in a significant proportion of individuals from the general population. These individuals display symptoms that are quantitatively, but not qualitatively, different from symptoms displayed by individuals diagnosed with a psychiatric disorder. Symptoms of a psychiatric disorder are now seen as on a continuum with normal experience. Over the last two decades, this approach has facilitated greater theoretical understanding of the implicit psychological mechanisms associated with psychopathology.

\textsuperscript{7} See Life Long Learning in the supplement for details
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Much of the research oriented at psychopathological behaviour now investigates the implicit and explicit behaviour strategies in samples of the general population by using the symptom-oriented approach. Our focus is on psychopathological symptoms across a continuum ranging from a symptom free, subclinical level to a clinical level. Recent research consistently shows, for instance, that cognitive dysfunctions in old age, depressive symptoms, and psychotic experiences (hallucinations, delusions) are situated on a continuum of symptoms, ranging from ‘normal’, symptom-free individuals and individuals with sub-clinical symptoms to individuals diagnosed with a psychiatric disorder. The ‘normal’, subclinical, and clinical levels of symptomatology differ primarily in severity and amount of life interference. However, the risk profiles for subclinical and clinical symptoms are similar. Therefore, it is suggested that implicit psychological mechanisms underlying the clinical disorder may also operate in subclinical manifestations.

Investigating symptoms in individuals who do not meet the criteria for a clinical disorder is an attractive approach to elucidate the underlying mechanisms of risk. As it has been suggested that individuals with subclinical symptoms are at increased risk of making the transition to a diagnosable disorder, attention is given to early detection and intervention in order to prevent individuals from making transitions from non-clinical to clinical states. We find it important to understand what actually causes individuals on some position at the continuum to become a clinical ‘case’. From a mental health point of view, investigating individuals at a lower level of the continuum is advantageous as it avoids potential confounds inherent to clinical patients, such as institutionalisation and side effects of medication (Claridge, 1994). In addition, since the prevalence of subclinical symptoms is much higher than the prevalence of the clinical disorder, it is easier to discover variability in subtle processes underlying the phenotype of the clinical disorder.

In conclusion, in the field of clinical psychology we aim to study the implications of the relation between implicit and explicit strategies for behaviour. By considering psychopathology no longer as a dichotomous, but rather as a continuous variable, a fruitful approach has developed. Given this perspective the discrepancy between explicit and implicit strategies not only is manifest (voices ‘in the head’ governing behaviour versus explicit assignments of the cognitive-behavioural therapists) but also subject to different interpretations of client, therapist and social environment. Questions addressed are:

- Assuming there is a continuum between "absolutely normal" and "extremely pathological" behaviour, how can therapies be expected to have effects in these ranges? To what extent is the continuum perspective of psychopathology reflected in a continuum of care (screening/early detection/therapy)?
- What are the implicit and/or explicit strategies for behaviour associated with psychopathology?
- To what extent are these implicit and/or explicit strategies associated with (subclinical) psychopathological behaviour modifiable? Do they reflect "that older primitive systems are more robust and resistant to insult than are newer, more complex systems" (Reber, 1989, p. 232)?
- To what extent are therapies effective in modifying implicit and/or explicit strategies associated with psychopathology?
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Social exchange

Organisational psychology studies human behaviour in the context of organised labour and work. In addition to the technical environment it is the social environment (as such or in interaction with the technical environment) that determines to an important degree the behaviour of individuals and groups in organisations. Human behaviour is studied on the level of the individual, the group and the organisation as a whole. Relations between individuals, groups, and the organisation (or society) are conceived of as social exchange relations. An important question that is studied in the present programme is: what explicit and/or implicit strategies guide the social exchange behaviour of individuals (and groups) in relation to other individuals, groups they are involved in, and the institution of which they are a member? Using laboratory experiments, large-scale social surveys, and observational research designs, the study of social exchange is applied to some of the most important phenomena in social collectives:

- The irrationality of deservingness: Just World processes and reactions to senseless violence
- Integrating organizational justice into job (re)design theory
- Compliance with authorities
- Bullying at work and in schools
- A fair characteristics model of organizational justice

Explicit norms dictate that people should show prosocial reactions towards victims of violence (senseless violence, bullying), such as compassion and help. Research shows that such explicit positive reactions do not always occur. Instead, victims undergo secondary victimization: they are derogated, blamed, condemned and sometimes rejected (see, e.g. Lerner, 1980). The negative reactions can be seen as a defensive just-world preserving process, based on an implicit belief in a just world that is threatened by being confronted with grave injustice. In our research JW-conditions are created by using explicit instances of violence which are supposed to trigger implicit, intervening processes that differentially influence people’s rational (explicit) and/or irrational (implicit) reactions towards victims and offenders.

Confrontation with grave injustice done to others can lead to explicit behaviour such as participating in silent marches. Bystanders of mobbing incidents can help or hurt the victim by an explicit, rational attribution of responsibility or by intervening implicit processes. Bystanders are assumed to implicitly perform a cost-benefit analysis of alternative actions, before choosing to act positively or negatively. Compliance with authorities (e.g. paying taxes without fraud) seems to be more dependent on the implicitly held notion of fairness of the authority, than on explicit deterrence strategies of the authorities. Perceived fairness of the authority almost automatically leads to increased legitimacy and trust, which is an important factor for explaining compliance. Perceived fairness of the employer leads to trust in the employer that he will not take advantage of the weaker position of the employee. It is expected that in case of a fair or just relationship between the exchange partners, employees will be prepared to accept a greater risk of resource depletion.

Different fairness judgments (distributive, procedural, interactional and informational) are expected to mediate the relation between characteristics of organizational allocation procedures and work related outcomes (satisfaction, commitment, turnover,...). Fairness can be triggered by explicit cues (e.g. reward allocations, having voice) but many of the processes involved are mostly implicit, such as social comparison, attributions of responsibility. In the cases of social exchange relations, as e.g. between citizens and public authorities and between employees and employers, authorities and

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8 For details see Psychological processes that implicitly and/or explicitly guide social exchange behaviour in the supplement.
employers should make it very explicit that they strive toward fairness. This can be realized by adopting fair procedures, e.g. by applying the fair procedural rules suggested by Leventhal (1980), by applying insights from interactional and informational justice research (account giving, openness, showing consideration), and by training those who interact with employees and citizens toward fairness.

Common themes of the projects are: (1) behaviour is guided by shared implicit and/or explicit norms, rules, beliefs, values that are characteristic for the exchange situation; (2) the behaviours under study are partly rational, controlled (explicit), partly irrational, automatic (implicit); (3) that psychological processes unconsciously intervene between situational cues and (automatic or controlled) behavioural responses, and (4) perceived fairness plays, mostly implicitly, a crucial role in all explanations.

Questions addressed are:

- Which explicit and implicit strategies do people generally bring into any social exchange situation; what can we expect from people and what do people generally expect from social exchange situations?
- To what extent do explicit social exchange strategies, formulated as instructions and regulations, hints etc., help to create more justice, less aggression, prevent bullying, compliance with authorities, fair organizations?
- To what extent can explicit rules be internalized such that they become implicit strategies?
- How and when can explicit, controlled strategies help or impede moral and ethical behaviour in social collectives such as organizations?

**Lifelong (implicit) learning**

One topical issue is an integral part of some of the instances given above. This concerns learning, in particular *implicit learning*. Implicit learning almost immediately suggests, if not implies, that learning happens all the time, *lifelong*. Although in education learning is often associated with acquiring explicit knowledge, the present programme emphasizes the role of implicit knowledge and competences in much of our behaviour, including the behaviour and expertise of us as professionals. And, for that matter, any person in a group that can be considered as an integrated member of that group, can, in a sense, also be considered as an expert in that particular part of social life. That is, knowing how to behave in a group or other social situation, in a society valuing health, dealing with deviant behaviour, etc. is following rules and norms rather than explicitly knowing the rules. In other words, “[k]nowledge of contexts and organizations is often acquired through a process of socialization through observation, induction and increasing participation rather than formal inquiry. Thus norms, local discourse and other aspects of an organizational or occupational culture are acquired over a significant period of time by processes which implicitly add meaning to what are explicitly interpreted as routine activities” (Eraut, 2000).

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9 See *Life Long Learning* in the supplement for details
The interaction between explicit and implicit strategies for behaviour

For our purposes, this contention is important in two respects:

- First, it orients our attention to implicit learning as part of the everyday cultural settings in which people partake.
- Second, it sensitizes us to not confuse perceived regularities in behaviour (such as routines and norm-following conduct) with the mechanism that actually led to those regularities in behaviour (such as observing, imitating, and participating).

In the present programme, the approach from a perspective of lifelong (implicit) learning studies behaviour assuming that:

1. Individual behaviour to a great extent depends on common practices in a group focussing on the ongoing mutual coordination (“tuning”) of their actions.

2. The ongoing tuning can acquire a stable character for the participants, recognizable as routines, habits, or automatic behaviour of a person. Routines are understood as embodied practices or skills, implying a focus on the unobtrusive training, by means of which these skills are adopted and refined.

3. Not only outward behaviour, but also feelings, cognitions, and in part even the senses become socially tuned within local communities of already skilled practitioners, and therefore are learned implicitly, lifelong. E.g. health related behaviour, social exchange, psychopathological behaviour can be studied, complementary to the psychological approaches as mentioned above.

4. Embodied practices are normative practices, precisely because they involve attuned feelings of right and wrong, proper and misplaced.

5. The acquisition of embodied normative practices occurs in a social and physical setting. Apart from understanding the explicit rules and the implicit conventions of a social group, it is important to understand how the physical environment facilitates, shapes or obstructs the behaviour of individual learners. The classroom is an obvious example, others are tailored advised routes for physical excercise (health), physical arrangements of computers at home to facilitate parental control in preventing cyberbullying among children (social exchange), halfway housing in secondary and tertiary prevention for psychopathological patients (mental health). Such arrangements are important in understanding how behavioural styles become shaped and regenerated.

Where implicit and explicit strategies come from and how they can be changed, depends on either evolution or learning. Questions that need to be addressed in this type of study are related to issues raised in other studies of the present programme:

- How do people learn and unlearn behaviours that have risks associated with the fields above, and how do they change or decide to change their behaviour regulation strategies in health and mental health, in organizations, in cultural settings, in sexual relations, in ageing, in education?
- What external circumstances help or interfere with changing or learning to change behaviour strategies?
- How can human environments be designed, such that learning and changing behaviour is stimulated where necessary or desirable?
The interaction between explicit and implicit strategies for behaviour

- How can health promotion interventions profit (lifelong) from the positive effects of a positive physical and social context for implicit learning?
- How can explicit rules and regulations for ethical or legal behaviour be supported or be undermined by implicit strategies for behaviour with ethical or legal consequences?
- How can organizations, (work) groups, and societies, function in more effective ways as a result of their members gaining explicit knowledge about effective ways of using implicit strategies for behaviour, e.g. in conflict management, organizational functioning and management effectiveness, healthy life styles, successful ageing, etc. ?

Methods

**ESM**

Resources have been invested in tools used for the Experience Sampling Method (ESM). ESM is a validated random signal-contingent sampling technique that allows assessment of moment-to-moment changes in emotions and behaviours as well as the environment in which they naturally occur (Hektner, Schmidt, & Csikszentmihalyi, 2007; Jacobs, et al., 2005; Myin-Germeys, et al., 2009; Stone, Shiffman, Atienza, & Nebeling, 2007). Participants receive a PDA that signals them 10 times a day over the course of several consecutive days. At the moment of signaling, participants answer short questions on current thoughts and emotions (e.g. I feel lonely; I feel bored; I feel stressed), activities (e.g. I like this activity), the context (e.g. whom are you with; where are you; what are you doing) and the appraisal of the context (e.g. I like this company; I’m not feeling at ease in this environment). ESM is a internationally used method, validated in clinical as well as in general populations (Hektner, et al., 2007; Jacobs, et al., 2005; Myin-Germeys, et al., 2009). ESM has several unique advantages (Myin-Germeys, et al., 2009; Stone, et al., 2007): (1) ESM allows to study behaviour in its dynamic interaction with the environment and to discover behavioural patterns, (2) implicit processes can be made explicit, (3) assessments are made in the participants’ natural everyday environment, which improves ecological validity of the reports, (4) assessments are made in the moment, which avoids memory bias of the reports and (5) multiple assessments over time offer great statistical power with small respondent samples.

Current research is based on this naturalistic research method and examines the role of daily life, implicit, affective processes in relation to psychopathology. Since this psychopathology is viewed as a continuous, rather than a dichotomous variable, a further step is to examine to what extend (therapeutical) interventions can be effective in modifying implicit and/or explicit strategies associated with psychopathology in an early, non-clinical stage by using active versions of ESM. Recently, research based on the ESM method has been set up in health psychological issues to investigate the implicit, contextual daily life determinants associated with addictive behaviour such as emotional eating and smoking.

Another tool the faculty has developed for research into implicit and explicit strategies for behaviour is the Virtual Laboratory (VL) (Zamani & van Dijke, 2007), a web-based tool developed for online experimentation and data-collection in general population samples such as students (Jacobs, van

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10 The methods discussed in this section are used in many studies in the present programme.
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Dijk, & Mudde, under review (dec 2009)). VL is used for several studies in the present programme but seems especially appropriate for studies testing hypotheses relating to the implicit and explicit processes in the flow of everyday life.

Some studies use participant observation, e.g. to study the long-term dynamics of group processes “in the wild”. By using these methods, we aim to bring to the surface the many hidden, implicit processes in groups and individuals.

More traditional methods, not needing an introduction, are surveys and questionnaires.

Research 2002-2009
The publication lists from 2002 till 2009 are presented elsewhere.
- Lijst van publicaties 2002.pdf
- Lijst van publicaties 2003.pdf
- Lijst van publicaties 2004.pdf
- Lijst van publicaties 2005.pdf
- Lijst van publicaties 2006.pdf
- Lijst van publicaties 2007.pdf
- Lijst van publicaties 2008.pdf
- Lijst van publicaties 2009.pdf

External evaluation
The programme will be ready for external evaluation within 5 years (2013). All new research projects, especially where Ph.D. students are involved, will be evaluated in advance by the research committee of the psychology department. The committee will solicit for the advise of two external reviewers. Both the advice of the committee and the advice of two external reviewers that can be considered as experts in the field of the proposal will be considered by the dean (programme leader). All reviewers will be asked to use a (slightly modified) version of the NWO criteria for individual research proposals.
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The faculty stimulates as much as budget allows conference visits, publishing in English, the preparation of research funding proposals etc.

**Background information**

Formerly the psychology department has had 7 fte available for research (20% of 36 fte for scientific personnel (wp)). The actual realization in 2006 amounts to 3,7 fte.

The low effort reflects:

- the till 2007 lacking separate mission for research
- the low budget for research aimed to reflect the interweaving of research in academic teaching
- the low budget for this faculty (1/3 of the OU students, 1/10 of the budget)
- the high teaching load due to the low budget

The faculty urges the university board to develop a fair and just budget for research and (if teaching and research are correlated variables) for teaching in the immediate future.

**Ph.D. tracks and other projects**

- Werkgerelateerd leren, stress en bevlogenheid in het werk 1 (LLL Open Universiteit/Koninklijke Militaire School (B))

- The procedural characteristics model. Studying procedural fairness in relation with power related situational characteristics (OUNL)


- Berndt, N. (2008-2012). Effectiveness of two intensive counseling methods for smoking cessation and relapse prevention in persons with coronary heart disease (ZonMw 50-50110-96-524); Co-promotor, projectleider: C. Bolman; Promotor L. Lechner & H. de Vries (UM)).


• Peels, D. (2010-2013). The Active Plus Project: (cost)effectiveness and feasibility of innovative tailoring interventions to enhance physical activity among the over fifties (ZonMw project 50-50110-96-656) (€ 471.387,=).


• R. Mulder Bystander behaviour and bullying in the workplace. (external Ph.D. Student). Promotor R. van Hezewijk; co-promotors M. Pouswels en H. Lodewijkx

• J. Eshuis. Evolution and the explanation of behaviour. Promotor: R. van Hezewijk; co-promotor Th. Verheggen

• G. Langendijk. The role of procedural fairness in power dynamics Promotor J. von Grumbkow. Co-promotor M. van Dijke

• B. Geenen. Rechtsvaardigheidsprocessen in selectiecontext. Promotor J. von Grumbkow

• Taverniers. Leren vermindert stress, stress verhindert leren. Promotoor J. von Grumbkow; co-promotor J. van Ruysseveldt


COMPLETED


Evolutionary foundations of behaviour: implicit and explicit strategies

A research programme focusing on explicit and implicit behaviour strategies and the interaction between them is aided by a focus on evolutionary foundations of behaviour. As any other species, humans are, after all, the product of a long evolutionary history. The results of this phylogenetic process is a set of adaptive, but mostly implicit behaviour strategies and predispositions, anchored in the genes waiting for environmental cues to come to an expression that matches the environmental demands.

During ontogeny these predispositions are transformed into specific dispositions as we interact with our environment. With regard to human behaviour, these dispositions can be described as strategies for behaviour, both on a biological and a psychological level. That is, some Evolutionary Stable Strategies on the phylogenetic level result, because of tuning during ontogeny, in behaviour strategies that result in higher probabilities of survival on an individual level. Because of this, the tuning of human behaviour has become more and more flexible, enabling regulation of behaviour in widely differing circumstances, that evolutionary speaking are often "unforeseen".

Tinbergen’s “Four Why’s”

The idea of human evolved behaviour strategies as implicit can be traced back to the work on human instinct by Charles Darwin (1859, 1871, 1872) and William James (1887, 1890, 1892). However, pronounced attention for the ontogenic development of such strategies during life, only more recently arose with the work of Niko Tinbergen (1951, 1963). Tinbergen pointed out that when biologists, psychologists, or ethologists ask about the “causes of behaviour” there are really four types of causes of behaviour to be distinguished (Tinbergen, 1952). Explanations focus either on:

1. The immediate causation of behaviour: the cause of behaviour as traditionally understood in the sense of the initial condition, immediately preceeding the behaviour. Such an explanation should also include a discription of the mechanisms that transpose the specific stimulus condition into a specific behavioural response.

2. The ontogeny of behaviour: to understand the interaction between stimulus (as part of the environment) and organism one needs to understand how the organism has become what it is. Therefore, one needs to study its ontogeny, i.e. the development of the organism and it's behavioural mechanisms and behavioural patterns. There are good reasons to assume that the boundaries of this development often have a deeper ground. Examples suggest that such development often is under epigenetic (in stead of purely genetic) control, implying that certain environmental conditions must be present in order for genes to express themselves in certain traits or features (Barendregt, 2004; Barendregt & Van Hezewijk, 2005).
3. The **phylogeny** of behaviour: an organism is not only the result of its ontogeny but also of its species’ evolution. The phylogenetic origins of an organism offer the framework of opportunities and constraints for the development of the body and its organs, as well as the behavioural patterns that members of a certain species can express. Knowing the evolutionary precursors of a species’ behaviour helps to answer the question what kind of behaviours are at all possible or impossible to find in a member of the species, or what behaviours are hard to erase or avoid.

4. The **function** of behaviour: in order to know why an individual member of a species performs as it does, one could analyse it’s phylogenetic or ontogenetic origins, and the immediate causes of its behaviour, but also what functions these evolved mechanisms have -- and have had -- for increasing the spread of it’s genes. Many cognitive mechanisms reduce uncertainty, or help to control motivation, and several of the social heuristics and mechanisms we take for granted, have an important function in that they directly help to maintain social networks, thereby help members of the species to survive and eventually procreate.

According to Tinbergen, each of these four explanations is complementary to the others, and an answer to each is necessary to fully understand behaviour. However, it is questionable whether these four explanations also are sufficient when it comes to human behaviour. Tinbergen already aptly remarked that during ontogeny, two processes could be distinguished. First, we point to the physical, including physiological and endocrinological process of maturation, under pressure of the environment. This process is largely epigenetic in nature and has profound influence on the adaptation of behaviour to local environments. The second, ontogenetic process is the largely psychological process of the implicit tuning of evolved predispositions to the local environment through learning processes.

*Additional “Why’s”*

In this last respect, an understanding of human behaviour becomes much more complicated than plain evolutionary explanations. Especially during ontogeny, much more is at hand than an epigenetic unfolding of evolved dispositions. Therefore, a more fine-grained conception is needed of the several ontogenic functions that are related to human behaviour, besides the plain phylogenetic function of reproductive success. Of course, humans do implicitly strive towards sexual reproduction, but people also adhere to group norms, simply for the sake of the feeling of belonging, they strive after hedonistic pleasures simply because it feels good, and finally they do set themselves explicit targets for behaviour, or at least they claim to do so. These strivings need not necessarily all point in the same direction. Reproductive effort might conflict with group norms or hedonism, and explicit behaviour strategies sometimes are directly opposed to any of the mentioned implicit strategies (Eshuis & Van Hezewijk, 2008).

For instance, the initially averse response to strangers seems to reflect implicit strategies for behaviour that are hard to avoid and unlearn, or even natural (Sober & Wilson, 1998; Wilson & Sober, 1994) even though our explicit principles of fairness object to that. Simple heuristics may prevent people from behaving morally in, e.g. deciding to sign for organ donorship (Gigerenzer, 2008a; Gigerenzer & Todd, 1999). On the surface, addictions may be learned responses (i.e. ontogenetically caused), yet may very well reflect strong preferences with a background in the
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evolution of the species, and meanwhile have consequences for health and for influencing unhealthy
behaviour such as eating fat or smoking. Note that the implicit strategies themselves need not
be (im)moral, or (un)healthy, or (ir)rational, or (un)fair, to have consequences in these areas.

Although explanations inspired by psychological, biological or evolutionary theories tend to be
interpreted as deterministic, without the need for any hypothesis of free will, it
nevertheless appears that humans sometimes have a choice. To a certain degree, in some
circumstances and at certain moments, humans can be autonomous; that is, they are, or at least feel,
free from internal heteronomy (e.g. hypnosis) or from external heteronomy (control from outside,
power) or disonomy (self-control is lost, broken or impossible) (Watkins, 1999). So, e.g. in sexual
behaviour, in fairness, in health and unhealthy behaviour, in pathological behaviour: "we feel that we
consciously cause what we do; and yet, our actions happen to us." (Wegner, 2002, p. ix ). The most
interesting question then becomes: how do conscious will and psychological determinism -- in the
words of Wegner (Wegner) sometimes become "friends"? In other words: how do these explicit and
implicit behaviour strategies interact?

Our research in this field has a twofold focus. On the one hand, given the principles above, we try to
formulate a general model of human behaviour that is grounded in evolutionary theory but also
allows for the emergence of socially tuned behaviour and asks about the space that is left for
genuine volition (Eshuis & Van Hezewijk, 2008; Van Hooren, Waterink, & Eshuis, 2009). On the other
hand, we focus on behaviour in some of the most important areas of life: health, mental health,
social exchange, sexual behaviour and learning. We try to discern explicit and implicit strategies that
people use in these areas. Our aim is to have the approaches mutually capitalize on each other, with
the theoretical approach plotting possible courses for research and the empirical work being a critical
check on the theoretical work.

Consequently, the basic questions in the present programme are:

which strategies regulate behaviour in diverse situations? How do people deal with
their implicit biological "forces" and their explicit cultural (cognitive, rational,
consensual, coordinated, etc.) demands for conformity, compliance, rational life style?
To what degree are humans free from biological constraints and forces in behaviour
that is allegedly, if not obviously biologically inspired? How can human environments
be (re)designed to release the apparent, if not real tension? Which intervention
strategies are appropriate? How do human (social) environments change as a result
of implicit strategies to coordinate behaviour, and how do people deal with explicit
regulation of behaviour?

Interestingly these questions can be put in a different way: if many behaviour strategies and
regulation mechanisms have biological functions, or ultimate or proximate causes, they may very
well be (have remained) implicit. That is, humans have propensities to act in ways that have
phylogenetic origins, or even ontogenetical sources but that are or have become automatic and of
which they are not aware. Nevertheless, they leave room for choices. Preferences may not need
inferences (Zajonc, 1980), but actions may need explanations on the personal level that refer to
inferences, even if sometimes the explanations (inferences) can only be provided for after the fact.
SEXUAL BEHAVIOUR

The way human beings deal with the implicit strategies we inherited interacts with the (often explicit) strategies that apparently belong to "culture". This leads to the following question that mutatis mutandis returns in every of our more domain specific research activities: Which explicit and implicit strategies do people use in behaviours in a diversity of situations and across situations, and in particular in respect with sexual behaviour? In other words, are there general characterisations for the implicit strategies that people use? To what cues do individuals initially react? How are these cues selected out of the seemingly endless amount of information that impinge on the individual? How do basic motivational or energetical processes modulate human behaviour? How do individuals learn which cues are the most relevant? How do they learn appropriate reactions to those cues?

These questions are investigated from a multidisciplinary perspective. Using insights from biological, social, clinical, and theoretical psychology, the focus lies on sexual behaviour as the most obvious domain on which evolution has endowed us with such implicit behaviour strategies. With regard to the last two questions directly above, it is not only investigated what implicit strategies are used, but also in how far these are made explicit during ontogeny and maybe even deflected to other goals.

The next of the central questions in a research programme like the present one follows from this: How do people deal with the differences between these explicit and implicit strategies for action, and how do explicit and implicit strategies interact? Not all implicit and explicit strategies conflict in a logical sense. Some may, in a way, even enhance each other; but unless the implicit and the explicit regulation strategies are incommensurable to each other, they may very well lead to the question how to deal with them when they lead to different actions. An example shedding light on this question, involves the sex drive, or the drive toward sexual selection.

Part of our research is the development of an instrument to measure this sex drive, and to answer questions how people deal with the tension between implicit mechanisms generating sex drive, and explicit behaviour regulating influences from the environment. Obviously most of the strategies in sexual behaviour are implicit. Although their bodily effects often are measurable and could be described as explicit behaviour, their mechanisms are automatic, not or only partially under conscious control, unintentional and they work efficiently (to repeat criteria given by (Friese, Hofmann, & Schmitt, 2008). Sex drive is considered as the evolutionary engine for specific male and female conduct. However, environmental, i.e. cultural influences moderate the strength of the drive. The evolved sex drive supposedly is strong, yet explicitly (culturally) canalized. How do people deal with the tension this situation creates? Even more so, what happens when cultural tunings of sexual impulses suddenly cease to function properly when, for instance, sexual inhibitions deteriorate because of ageing?

In a similar way, the "relations between the sexes" may be presented as the result of explicitly justified, rational choices, e.g. in partner selection; however there may be very stable explanations of behaviour in terms of implicit strategies, preferences, obsessions, regularities that we are unaware of. Within this context, our research focuses on jealousy. Jealousy can be defined as the negative emotional response to the actual, imagined or expected emotional or sexual involvement of the partner with a rival (e.g. Bringle & Buunk, 1991). According to evolutionary psychologists, jealousy
alerts the individual to take action when the pair bond is (perceived to be) threatened by a rival. By preventing a partner’s extra-dyadic involvement (and thus a potential loss of reproductive resources), jealousy enhances individuals’ fitness and chances of survival (e.g. Buss, 2000).

Because, in our evolutionary past, for long periods of time, humans lived in relatively small groups or tribes of maximally 150 individuals of which about 20% was kin (Hill & Dunbar, 2003), jealousy evolved in an environment characterized by a limited number of potential rivals. Nowadays, by means of television and internet, individuals are, on a daily basis, exposed to numerous highly attractive same-sex individuals that may all be perceived as potential rivals for their partner’s attention. Moreover, since the introduction of the mobile telephone and internet, the possibilities of, secretly, approaching and communicating with opposite-sex individuals have increased enormously, possibilities that may all activate the mechanism of jealousy. Research has indeed begun to show that individuals consider infidelity through the Internet to be as real as offline infidelity (Schneider, 2003; Whitty, 2005) and may, indeed, evoke considerable amounts of jealousy (Dijkstra, Barelds, & Groothof, 2010).

For several reasons it is important to examine the extent to which modern forms of potentially unfaithful partner behaviours evoke jealousy, and how they affect individuals’ wellbeing and relationships. From a theoretical point of view it is relevant to know how the experience of such an evolutionary old mechanism as jealousy is affected by our modern, technologically enhanced environment. For instance, do ‘modern’ potentially jealousy-evoking partner behaviours evoke qualitatively and quantitatively similar jealousy responses than more traditional, i.e. physically verbal and non-verbal, behaviours? Research of Groothof, Dijkstra and Barelds (Groothof, Dijkstra, & Barelds, 2009) has already set one step in this direction by showing that similar sex differences are found in the jealousy responses to online emotional and sexual forms of infidelity as were previously found following offline forms of emotional and sexual infidelity. From a practical point of view this knowledge is important to help develop more effective therapies to adequately deal with (maladaptive forms of) jealousy in response to a partner’s involvement with potential rivals by means of modern communication devices. A growing number of couples struggle with this issue, whereas, in the mean time, therapists do not yet have the right tools to help these couples (Dijkstra, et al., 2010).

Future research on jealousy will focus on further specifying the jealousy responses to different ‘modern’, potentially jealousy-evoking partner behaviours. For example, relevant questions are what forms of modern infidelity evoke the strongest feelings of jealousy in men and women, and what type of jealousy is evoked by modern forms of infidelity (e.g. anxious or angry jealousy, cf. (Buunk & Dijkstra, 2004). In addition, future research will study the behavioural and motivational strategies that feelings of jealousy may evoke to protect the pair bond. For example, are jealous people motivated to make themselves more attractive to their partner, or are they motivated to derogate their rival? In all these studies, relevant individual differences will be considered, such as social comparison orientation and neuroticism.

**ONTOGENETICAL AND VOLITIONAL ADAPTABILITY**

Tinbergen’s analysis of the four ways to explain behaviour, as discussed above, also guides research activities of a more conceptual nature. By tradition psychology is mainly concerned with the first and second types of Tinbergen’s causes. When more attention is given to the third and fourth of
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Tinbergen’s causes it becomes more clear how and why many implicit behaviour strategies have come into existence. It could also be helpful in clarifying how these have led to the emergence of the human capability to form explicit behaviour strategies in certain domains as well.

Taken together, the phylogenetic and ontogenetic backgrounds of the individual constitute constraints on behaviour, on behavioural change, on habit formation, on sensibilities and susceptibilities for opportunities and risks, which largely can be interpreted as implicit behaviour strategies. Eshuis & Van Hezewijk (2008) and Van Hezewijk & Verheggen (2007) suggested that, by expanding Tinbergen’s analysis with some relatively simple additions, a sufficiently rich framework emerges for explaining properties of organisms, including human behaviour strategies. This includes the “social organs”, the cognitive equipment, the outfit of emotions and feelings that are typical for the human species, and the so-called “determinants” of psychopathological and health related behaviour. One could see them as the result of both the first and second nature of the species. That is, they are the result of implicit, explicit or habitual dispositions to react to e.g. (un)healthy stimuli, (un)Fairness, social dilemmas, and ways of dealing with others that have developed in small and large groups by way of consensual coordination. (See also Van Hezewijk, 1998, 1999, 2001, 2002, 2003, 2005).

As discussed earlier an expanded evolutionary model is being developed that is thought to be appropriate to understand these processes (Eshuis & Van Hezewijk, 2008; Eshuis, Van Hezewijk, & Verheggen, 2009). If the emergence and existence of ‘culture’ can be explained as the result of implicitly and consensually coordinated actions (Verheggen, 2005; Verheggen & Baerveldt, 2001, 2007; Voestermans & Verheggen, 2007) the core question is: What are the evolutionary precursors of behaviour with an apparently, allegedly cultural origin? The expanded evolutionary model that is being developed addresses this question primarily with the aid of the theory of sexual selection (Darwin, 1871; Miller, 1998, 1999, 2000). Related to the concept of culture of Verheggen (2005) and Tomasello (1999, 2006) on intentionality, new insights are explored in which ‘culture’ is analysed as explicit and – mostly – implicit strategies for sexual behaviour. In other words: to what extent do implicit strategies for behaviour that result from the interaction of individuals in groups reflect, conflict with, or support systems of partner selection at several ages? And, posing the question the other way around: Can the often explicit cooperative strategies that lie at the foundation of cultural behaviour be explained as an outcome of the mainly implicit competitive process that occurs during sexual selection?

Consequently, the said model primarily offers a framework to answer the first two questions of our programme: 1) which explicit and implicit strategies do people use, and 2) how do these strategies interact? However, by addressing these questions by means of a theoretically grounded model, we also offer a structured framework for the approach of the third and fourth question. Biological determinants are a source of implicit behaviour regulating mechanisms. Especially where the opportunities, capacities and constraints for successful interventions are concerned, they cannot be underestimated. They have consequences for what can be easily influenced by learning, or by negotiating, or in consensual coordination, in “wilful” behaviour change, in “reasoned action”, etc., and what cannot be easily changed – e.g. in health related behaviour, moral behaviour (fairness). In other words: to understand which interventions might work, and which might not, the interaction of both phylogenetical and ontogenetical, including social factors, must be
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studied. That is, not only that, but also how explicit and implicit strategies work and interact, and to what degree they influence behaviour. If human evolution has led to a restricted number of evolved predispositions, there must be differences in the degree that explicit regulation of behaviour will succeed. This leads to the third of our central questions: How much room is there for changing these strategies in the diversity of situations that people come across?

From a theoretical angle it can be suggested that the third and fourth of Tinbergen’s determinants play a role in answering this third of our central questions. For instance in the evolutionary utterly relevant categories of ‘sex’ and ‘age’ implicit behaviour strategies can be found that are differentially hard to change and that are differentially vulnerable for cultural “redesign”. Building on aforementioned primary implicit behaviour strategies, mankind has, over the course of evolution, developed the capacity for cultural, behavioural change, but this capacity could very well depend on the “domain” of behaviour. It is on this level that behaviour strategies can become explicit (i.e. through rules that are instated in a specific social group). Room for changing these strategies thus lies in changes that can be made to the physical and social ontogenic environment. Understanding how specific cues from this environment lead to actions in a specific behavioural domain, allows us to wilfully change this environment with the object of directed behavioural change. Thus the fourth question to be asked stems from a theoretical analysis but has consequences in a diversity of practical domains: How can human environments be (re)designed to influence this multitude of strategies? In other words, again, the question is which intervention strategies are adequate? Can environments be (re)designed such that they become richer in terms of learning opportunities?

Seen from the perspective of rational change and intervention, the latter questions are appropriate. From a perspective of culture as dynamic, yet unplanned tuning of behaviour in a group, the question should be rephrased into How do human environments change to release this tension? In a number of studies (Stam & Van Hezewijk, 2007; Van Hezewijk & Verheggen, 2007; Verheggen, 2005; Verheggen & Baerveldt, 2001; Voestermans & Verheggen, 2007) it was suggested that "culture" can be understood as the ever-changing and short-term evolving result of adapting behaviour to environmental challenges -- including the consensual coordination or mutual adapting of social behaviour (Verheggen, 2005) -- and perhaps also the result of attempts to consciously deal with implicit dispositions having phylogenetic origins, in order to resolve the tension with explicit social demands. Work is now in progress to study the consensual coordination of actions in newly formed groups of adolescents, using observation techniques to establish coalition formation and power relations (De Bil & Verheggen, in preparation). Another interesting approach still to be explored is how professionals learn (their lives long) to deal with the explicit rules and regulations of their trade, and the implicit strategies to solve actual problems, e.g. in the domain of professionals in the legal system. Elsewhere remarkable results have already been found (Gigerenzer & Engel, 2006)

Explicit and implicit strategies for health

A substantial part of the research interests in the present programme are related to health, especially health promotion and prevention, and patient education and communication. Keeping in mind the need for knowledge in society we focus on:

- Primary prevention: how to prevent health problems from emerging due to unhealthy lifestyles, targeting to changing unhealthy behaviours such as smoking, physical inactivity, unhealthy
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nutrition behaviours (e.g. too little fruit and vegetables, too much high saturated fatty foods), excessive alcohol consumption, excessive UV-exposure. How explicit or implicit are the strategies executing these behaviors, and how are lifestyle behaviours influenced by implicit and explicit strategies and determinants?

- Secondary prevention of health problems: early detection of health problems (e.g. distress) and illness (cancer, cardiovascular diseases), screening for health problems and illnesses: How is detection by patients and caregivers influenced by implicit and explicit determinants? And how do (potential) patients deal with the (explicit) knowledge and prescriptions, or implicit heuristics for healthy action?

- Tertiary prevention of health problems: strategies for coping with health problems, self regulation in and after illness, optimization of recovery, adjustment and adherence to medical and psychological advice (e.g. in terms of coping with chronic disease), optimization or clarification in physician-patient communication. How do implicit and explicit strategies influence patients’ and physicians’ behaviour? How do professionals implicitly or explicitly deal with their tasks and relate to their patients?

The focus is on the role of explicit and implicit strategies and on determinants (and the interaction between them) that are related to these behaviours with an intended or non-intended effect on health. More particular, it is our mission to find answers to the following questions:

Which determinants and explicit and implicit strategies result in health related behaviours, in a diversity of situations and across situations?

In testing health psychological theories and models for the explanation of behaviour and behaviour change we focus on testing, comparing, and combining theories emphasizing explicit strategies and determinants with theories emphasizing implicit strategies and determinants (Lechner, Kremers, Meertens, & De Vries, 2007).

In relation to health we focus on finding determinants and strategies for explaining health behaviour and behavioural change by studying the aforementioned implicit and explicit determinants/behaviour strategies people use. We also study how these determinants and strategies interact with each other. Health behavioural change is assumed to be a dynamic process in which three phases can be distinguished: the premotivational phase, the motivational phase and the postmotivational phase (Lechner, Bolman, Van Stralen, & Mudde, 2007; Sutton, 2005; Van Stralen, Lechner, Mudde, De Vries, & Bolman, 2008). Each of these phases are characterized by determinants, implying that for behavioural change in every phase it is necessary to specify the determinants of each phase and to take its’ determinants into account (Lechner, Kremers, et al., 2007; Van Stralen, Kok, et al., 2008). The individual contribution of determinants and, consequently, the implicit and explicit strategies varies among the phases.
Below, we emphasize the implicit and explicit determinants and strategies that form the scope of our research and how they relate to each other. We also make clear in which phases of behavioural change they are important.

**EXPLICIT DETERMINANTS AND STRATEGIES**

One group of determinants are considered to be explicit since they represent cognitions that are conscious and under volitional control. Social Cognitive Theory (Bandura, 1986), Theory of Planned Behaviour (and its latest successor, the Reasoned Action Approach (Fishbein & Ajzen, 2010), The Health Belief Model (Harrison, Mullen, & Green, 1992) and Protection Motivation Theory (Norman, Boer, & Seydel, 2005) are examples of theories that are based on motivational determinants. In the field of patient education there are additional models, specifically developed for patient behaviour, such as the Common Sense Model of Illness Representation (H. Leventhal, Brissette, & Leventhal, 2003) (Rozema, Volland, & Lechner, 2009). The fundamental nature of these theories and models is based on the premise that people’s behaviour is to a large degree determined by explicit, mostly cognition based determinants, resulting in the above described controlled responses. In essence these models are based on the assumption that we behave in certain ways because we intended to do so, that the intentions are based on decisions that in turn are based on a combination of beliefs about the consequences of the behaviour (attitude), our perception of the social norms and our estimation of our control and skills (self efficacy) (Lechner, Bolman, et al., 2007; Van Stralen, De Vries, Mudde, Bolman, & Lechner, 2009).

A second group of explicit strategies for behaviour concerns self-regulatory planning factors such as action planning and the formation of implementation intentions, which are just as the first group under volitional control. Self-regulatory planning is characterized as a cognitive process in which persons specify a sequence of behavioural and cognitive strategies to achieve and maintain behavioural change. When people do not make plans on how to change their behaviour (action plans) and on how to maintain their behavioural change (coping plans), their chance of successfully changing behaviour and maintaining that change decrease dramatically. Studies of others (e.g. (Armitage & Arden, 2008; Sullivan & Rothman, 2008) but also our own recent studies (Van Osch, et al., 2009; Van Osch, Lechner, Reubsaet, & De Vries, 2008; Van Osch, Reubsaet, Lechner, Candel, et al., 2008; Van Osch, Reubsaet, Lechner, & De Vries, 2008) suggest the importance of these self-regulation techniques in changing health behaviours. Furthermore, our studies revealed that these planning concepts are important moderating and mediating variables on the relation between traditional motivational determinants (e.g. intention, self-efficacy) and health behaviour (Van Osch, et al., 2009; Van Osch, Lechner, et al., 2008; Van Osch, Lechner, Reubsaet, & De Vries, 2010). In the process of behavioural change (in the postmotivational phase), this process of action control is initially applied consciously (explicit). The ultimate goal is that these strategies become automatised as habits over time, becoming implicit (see e.g. Gollwitzer, 1999).
IMPLICIT DETERMINANTS AND STRATEGIES

One important determinant of resistance to behavioural change is lack of awareness. Before people can be explicitly motivated to change their behaviour, they have to explicitly become aware of the fact that they themselves are behaving in a risky way (and therefore have a problem). Because people often implicitly suppose there is no need to change their own behaviour, contemplating behavioural change will not be initiated (Weinstein, 1988). As Weinstein’s Precaution Adoption Process Model suggests, there are several stages of awareness. In the first stage people lack knowledge of the relation between risky behaviour and a health risk, in the second stage they do know about this relation (so explicitly they are aware of their own risk), but they do not explicitly apply this knowledge to their own behaviour. Hence, making people aware of their own personal actual risk (making knowledge explicitly relevant) is an important prerequisite (but no guarantee) for people to be motivated to change their behaviour (Lechner, Bolman, & Van Dijke, 2006; (De Ridder & Lechner, 2004) (Van Stralen, et al., 2009; Van Stralen, Kok, et al., 2008; Van Stralen, Lechner, et al., 2008). A lack of awareness of the risk of one’s health behaviour presumes that a person is still in a premotivational phase of change, i.e. not motivated to change. Only after a lack of awareness is eliminated, motivational factors such as attitude can become relevant and can make persons willing to change and to shift to the motivational phase of change.

With regard to risk perception and health it is important to get insight into the constraints on cognitive performance influencing the perception and awareness of risk and the interpretation of probabilities, both in health related behaviour and in the interpretation of health and illness related tests (Gigerenzer, 2002; Lazarus, 1966; Weinstein, 1988), leading to more sophisticated approaches in health promotion, patient-physician communication, coping and social support, etc.

A second important implicit determinant is habit. As stated above, much of our behaviour is automatic, based on habits we have acquired throughout time. Although these behaviours may have been determined by explicit motivational determinants at one stage, they have become implicit and unintentional over time (Aarts, Verplanken, & Knippenberg, 1998). The role of habits in explaining behaviour has been our focus in several studies (Janssen, Van Osch, De Vries, & Lechner, submitted for publication) (Bolman, Arwert, & Vollink, in press; Lechner, 2007). Strategies for changing unhealthy implicit habits would be to make people aware of their existence and of the processes that initiate these habits, combined with providing tools for alternative and healthier responses. In other words, make implicit automatic processes more explicit and provide people with options for explicit and controlled responses. In time these new explicitly produced behaviours have to become new habits again, ensuring implicit automatic new behaviour.

Third, much of our behaviour is directed by environmental factors (Green & Kreuter, 2006; Swinburn, Egger, & Raza, 1999). This results in implicit cues that often we are unaware of, i.e., physical, sociocultural, and even economic and political characteristics (Lechner, Kremers, et al., 2007) (Lechner, Bolman, et al., 2007; Lechner, Kremers, et al., 2007; Van Stralen, et al., 2009; Van Stralen, Lechner, et al., 2008) (Voestermans & Verheggen, 2007). Political and organizational factors can
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influence behaviour strategies in an unintended way by presenting them in one way or another. For example, partly due to the political choice for an opting-in system for organ donation registration in the Netherlands, which respects the highly esteemed, will or autonomy, there is a substantial shortage of organ donors. As a consequence, long waiting lists for patients who need donor organs exists, even leading to unnecessary deaths (Nijkamp, Hollestelle, Zeegers, Van den Borne, & Reubsaet, 2008). People are often unaware of these environmental influences; our own research revealed that making people aware of environmental influences (i.e. making them explicit) is effective for behaviours such as encouraging physical activity (Van Stralen, De Vries, Mudde, Bolman, & Lechner, in press).

How do people deal with the discrepancies between these explicit and implicit behavioural determinants and strategies for action?

The above mentioned explicit and implicit strategies can either intensify or decline each other’s influence on health related behaviours. The studies we already conducted on this issue revealed that awareness of risks is one important prerequisite in changing motivation and behaviour for physical activity (Van Stralen, Kok, et al., 2008) (Van Stralen, et al., in press). Other studies show that self regulatory planning, habit, and perceptions of the environment influence the relation between motivational determinants and health behaviours, either as moderators or mediators (Van Stralen, et al., in press) (Lechner, Bolman, Van Stralen, & Mudde, submitted; Van Osch, Lechner, et al., 2008; Van Osch, et al., 2010; Van Osch, Reubsaet, Lechner, Candel, et al., 2008; Van Osch, Reubsaet, Lechner, & De Vries, 2008). Moreover, several theories and models explicitly focus on the duality of implicit and explicit behaviour strategies, and on the relation between them. For example the Elaboration Likelihood Model (Petty, Barden, & Wheeler, 2002).

Discrepancies between explicit and implicit behaviour strategies are also apparent for health professionals. Especially in service jobs employees are often required to show certain emotions because they function to please the customer or are more helpful for a patient. Arlie Hochschild subsumed the implicit and explicit strategies that workers use to regulate their emotions under the header emotional labor (Hochschild, 1983). A key concept in understanding the possible effect of emotional labor seems to be emotional dissonance (Härtel, Hsu, & Boyle, 2002). Emotional dissonance refers to the discrepancy between the emotional demeanor that an individual displays and the emotions that are felt (Mann, 1999). This dissonance is seen as an inevitable concomitant of emotional labor (Briët, Näring, Brouwers, & van Droffelaar, 2005). Emotional labor is studied in various professions in experienced workers and novices to gather knowledge about how employees learn to apply emotional labor in such a way that it will not affect their health (Lechner, Steinvooorte, & Näring, 2008).
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How much room is there for changing these strategies in the diversity of situations that people come across? How can human environments be (re)designed to reduce discrepancies?

Changing health behaviour through changing implicit and explicit strategies of behaviour regulation is and remains an important target of our research. Changing behaviour strategies requires a specific approach (Schaalma, Kok, Meertens, & Brug, 2007). Often, stimulating change is targeted at making determinants and implicit strategies explicit to the target population. Health educators especially pay attention to controlled or controllable processes. Even where certain behaviours are carried out more or less automatically, health educators will often try to make this behaviour become more explicitly motivated and intentional (Van Osch, Lechner, et al., 2008; Van Osch, et al., 2010; Van Osch, Reubsaet, Lechner, Candel, et al., 2008; Van Osch, Reubsaet, Lechner, & De Vries, 2008). This is usually based on the implicit assumption that intentional behaviour brings about the most sustainable behaviour change, and that interventions to promote healthy behaviour are more ethically responsible when they stimulate autonomous choices. This ethical aspect reflects, of course, one of the sources for the discrepancies between explicit and implicit behaviour strategies. Even though interventions try to influence explicit determinants and strategies, this can still be a method to change existing determinants and implicit strategies, as the ultimate goal in health psychology is to create new healthy automatic behaviours and habits.

Another question regards the assumption that habits are automatically activated behaviours (as mentioned above). It is suggested that the vulnerability, if not sensitivity, for changing automatic behaviours depends on the way a habit has been acquired. Some habits are "first nature", that is are part of our evolutionary make-up, and/or genetically ingrained. An eye blink can be the object of an intention to change, but the intention might be hard to realize, if possible at all. "Second nature" habits, such as fetching a beer at ten o’clock, can be hard to break as well, nevertheless may be trained to unlearn. From the latter example it also may be clear that changing habits is not a yes-or-no matter depending on the genetic or other nature of a habit. Learned habits may have consequences that are interwoven with "built-in" mechanisms, even mechanisms of an apparently non-related nature. Smoking, drinking and other addictions are clear examples. For instance "(t)he observation that merely smelling a preload is sufficient to produce counterregulation in dieters but not in nondieters challenges the widely held cognitive explanation of experimental counterregulation in preloaded dieters” (Jansen & Van den Hout, 1991). However, it is here that the room for change can be diverse, depending on the nature of the habit.

An intervention method often used in our current research is computer tailored advice (De Nooijer, Lechner, Candel, & De Vries, 2004; Van Stralen, et al., 2009) (Oenema, Brug, & Lechner, 2001). Tailored personal advice can be directed at all previously mentioned determinants and implicit and explicit behaviour strategies. One of the methods in computer tailoring is to make determinants and implicit strategies explicit to the participant by confronting them with the influence of determinants on behaviour, and with discrepancies between their own (explicit) beliefs and their behaviour. Once these determinants and implicit strategies are made explicit to the participant, they can be influenced, and directed towards healthier behaviour. For example: making people aware of the unhealthy habits they have, and of the environmental cues that result in automatic response, can be completed by providing them with the opportunity to learn explicit self regulatory planning skills.
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These self regulation skills can help people to break with old automatic behaviours, for example by learning persons to make self-regulatory action plans and coping plans with regard to the new behaviour, by facilitating automatization of actions and associating actions with environmental cues (De Nooijer, et al., 2004; Van Stralen, Lechner, et al., 2008) (Oenema, et al., 2001).

An intervention strategy which is now under study consists of modifying the implicit associations between environmental or affective cues and behaviour (through which craving occurs) by attentional retraining. This has already been shown to be effective in heavy alcohol drinkers (Schoenmakers, et al., in press; Schoenmakers, Wiers, Jones, Bruce, & Jansen, 2007) and is currently under study within the scope of the research programme for smoking.

An intervention method which combines explicit and implicit strategies concerns Entertainment-education. This strategy aims at changing behavioural determinants by entertaining the target group. In this way the audience does not feel to be explicitly lectured by what to do or what not to do but is more implicitly exposed to health messages (e.g., by mere exposure to condomats at the set or by role modeling). Research showed that young people can be educated about sexually transmitted diseases and safe sex by watching soap operas (Nijkamp, Dokter, & Bouman, 2005). This entertainment-education strategy is a promising tool to target the more implicit determinants of behaviour.

Of special concern are questions regarding the explicit and implicit handling of health related interventions and diagnostics by professionals (for example (Braeken, et al., 2009; Braeken, et al., in press; Janssen, et al., submitted for publication). How do they deal with the canons of their professions and to what extent do they adhere to professional and evidence based good practice guidelines? (Wegwarth, Gaissmaier, & Gigerenzer, 2009). If the professional discipline stresses “evidence based” intervention, how do professionals match their intuitions (de klinische blik, or their ‘gut feeling’) to the evidence in the (very large) databases of the discipline and factors relate to this matching (Nijkamp, 2010)?

Evaluating effectiveness of innovative interventions (e.g. tailored digital advise) aimed at changing strategies of health (threatening) behaviour and lifestyles, focusing on determinants such as different settings (e.g. school, community, workplace, health care), and different levels (individual, group, organization), remains an important instrument testing hypotheses about the way explicit and implicit behaviour strategies operate and how behaviour regulation takes place.
Explicit and implicit strategies in clinical psychological issues

Considering explicit and implicit strategies in clinical psychological issues, our focus is on psychopathological symptoms across a continuum ranging from a symptom free, a subclinical to a clinical level.

Research in the field of clinical psychology is gradually shifting from a purely categorical syndrome-oriented approach to a dimensional, and even more specific, symptom-oriented approach (e.g. Bentall, 2004). This symptom-oriented approach has the advantage that it offers a way to investigate the clinical concept without accepting the traditional Kraepelian model. Over the last two decades, this approach has facilitated greater theoretical understanding of implicit psychological mechanisms. Therefore, much of the research oriented at psychopathological behaviour investigates the implicit and explicit behaviour strategies in samples of the general population by using a symptom-oriented approach (e.g. Jacobs, et al., under review (dec 2009)).

Traditionally, psychopathological symptoms have been considered as features of “mental illness”, which are either present or absent. This dichotomy is inherent in current categorical diagnostic systems, such as DSM-IV and ICD-10. Although this dichotomous, categorical representation of psychiatric disorders is convenient for professional communication and clinical decision-making, it may not be an accurate reflection of the phenotype of the disorders as they occur in daily life. There is mounting evidence that psychiatric symptoms are not only present in individuals diagnosed with a psychiatric disorder, but also occur in a significant proportion of individuals from the general population. These individuals display symptoms that are quantitatively, but not qualitatively, different from symptoms displayed by individuals diagnosed with a psychiatric disorder. Symptoms of a psychiatric disorder are therefore on a continuum with normal experience. Such a continuum view is already well accepted in the field of medicine, for example blood pressure is known to be continuously distributed in the general population.

In the field of clinical psychology, the continuum view is increasingly accepted as a promising approach (Myin-Germeyns, et al., 2003). For example, recent research consistently shows that cognitive dysfunctions in old age, depressive symptoms, and psychotic experiences (hallucinations, delusions), and are situated on a continuum of symptoms, ranging from ‘normal’, symptom-free individuals and individuals with sub-clinical symptoms to individuals diagnosed with a psychiatric disorder (Thewissen, et al., 2005; Van Hooren, et al., 2008). The ‘normal’, subclinical and clinical levels of symptomatology differ primarily in severity and amount of life interference (Van Hooren, Valentijn, Bosma, Ponds, Van Bokxel, & Jolles, 2007; Van Hooren, Valentijn, Bosma, Ponds, Van Bokxel, Levine, et al., 2007). However, the risk profiles for subclinical and clinical symptoms are similar. Therefore, implicit psychological mechanisms underlying the clinical disorder may also operate in subclinical manifestations (Thewissen, et al., 2007). Investigating symptoms in individuals who do not meet the criteria for a clinical disorder is an attractive approach to elucidate the underlying mechanisms of risk. As it has been suggested that individuals with subclinical symptoms
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are at increased risk of making the transition to a diagnosable disorder, increasing attention has been
given to early detection and intervention in order to prevent individuals from making transitions
from non-clinical to clinical states. It is important to understand what actually causes individuals on
some position at the continuum to become a clinical ‘case’.

From a mental health point of view, investigating individuals at a lower level of the continuum is
advantageous as it avoids potential confounds inherent to clinical patients, such as
institutionalisation and side effects of medication (Claridge, 1994). In addition, since the prevalence
of subclinical symptoms is much higher than the prevalence of the clinical disorder, it is easier to
discover variability in subtle processes underlying the phenotype of the clinical disorder.

Which explicit and implicit strategies do people use in behaviour that have an effect on mental health,
in diversity of situations and across situations? Which methods are used to measure behaviour
strategies and their effects?

Ever since Freud introduced the concept of the unconscious in psychology, explicit and implicit
strategies underlying human behaviour have been central to the field of clinical psychology.
According to Freud, the continuous tension between the instincual desires and the explicit rules of
culture and society might find its relief through the development and persistence of
psychopathological symptoms. However, according to Beck, psychological well-being is more likely to
be determined by the way in which humans perceive, interpret, and attribute meaning in their
everyday lives, a process known as cognition. In the last decade, new ideas emerged in which these
points of view seem to coincide. In these new ideas, mental and cognitive processes are divided in
two levels. At a lower level, there are fast and inflexible routines that are largely automatic and may
occur without awareness. At a higher level, there are slow flexible routines that are explicit and
require the expenditure of mental effort (Frith & Frith, 2008). Psychopathological symptoms can be
explained by dysfunctions at the implicit level, for example people diagnosed with a psychosis lack
implicit mentalizing, which impairs the ability to read the desires, intentions and beliefs of other
people, resulting in explicit behavioural symptoms. On the other hand, it has also been demonstrated
that symptoms originate from difficulties at the explicit level. For example, among older adults
having mild cognitive impairment or persons with a traumatic brain injury may experience difficulties
with using explicit strategies, such as planning their behaviour and organizing leisure time activities
(Van Hooren, Valentijn, Bosma, Ponds, Van Boxtel, Levine, et al., 2007). These patients have the
tendency to rely on automatic behaviour and routines, while it is essential that explicit strategies are
used, e.g. that the proper goal is selected and maintained in memory while performing a task.

Among the research the present programme focuses at, are the implicit determinants associated
with persistent maladaptive, deviant or ‘abnormal’ behaviour that is considered as problematic for
an individual or his/her environment, especially in everyday life. After all, the majority of
psychological and psychiatric symptoms are internal mental phenomena that are embedded in the
context of everyday life. They occur during everyday activities, while individuals are interacting with
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The persons and the world around them. Symptoms might be triggered by experiences of events in the environment: they might be implicit or explicit, cognitive, or social strategies elicited by contextual determinants. Nowadays, it is well acknowledged that the study of these implicit processes in the flow of everyday life may provide a powerful and necessary addition to the more traditional research traditions in psychopathology (Myin-Germeys, et al., 2009). Therefore, this approach demands the use of different research methods.

The study of implicit determinants associated with psychological well-being using in depth research involves studies using the Self Confrontation Method. An example of the in depth study of implicit determinants associated with psychological well-being is the study of the affective components of self-narratives (Hermans & Hermans-Iansen, 1995; Van Geel, 2000). The Self-Confrontation Method (SCM), rooted in valuation theory (Hermans, 1976, 1981), is a type of counselling in which themes of a person’s self-narrative are identified and discussed in a profound dialogue. The purpose of the SCM is to stimulate self-examination so that the client learns to detect in his/her story affective patterns that are reflections of two “latent” basic motives: (a) the striving for self-enhancement (the Self motive), and (b) the striving for contact and union (the Other motive). For a psychometric study of the scales, see Van Geel and De Mey (2003). An important result of the self-exploration with the SCM is that (positive and negative) themes associated with the basic motives become “visible” in the self-narrative that offer suggestions to the client about how to proceed. (For studies concerning the use of visual representations in SCM counselling, see Van Geel & De Mey, 2004; Van Geel & De Mey, 2009; Van Geel, De Mey, Thissen-Pennings, & Bendermacher, 2000). In general, the SCM counsellor should be attentive to the possible “one-sidedness” of the self-narrative as a whole (the so-called “valuation system”) because this may indicate dysfunction. In this respect valuation theory is comparable to theories of personality disorders (DSM-IV), diathesis-stress theories of depression (Beck, 1983; Blatt, 2004), interpersonal theory (Horowitz, 2004), and adult attachment theory (Mikulincer & Shaver, 2007), as all these theories share the notion that “one-sidedness” or “inflexibility” is an essential element of dysfunction (For a discussion, see Van Geel, 2000, Chapter 2). More specifically, all these theories consider psychopathology to be the result of an overemphasis on either the striving for connection or the striving for self-definition. One recent project has focussed on the idiogetic assessment of adult attachment relationships and (the introjective and anacritic) vulnerability factors in depression with the Self-Confrontation Method (Tenten, 2009; Van Geel, 2007; Van Geel, Houtmans, & Tenten, in prep).

A crucial feature of SCM counselling is the discussion of the (implicit) affective side of a valuation system in relation to the (explicit) content of the self-narrative. So, in the SCM a person is discussing his/her experiences from two perspectives. The idea is that by bringing these perspectives together new associations and meanings may emerge, which are assumed to be beneficial to one’s psychological health. Sometimes “distortions” are observable when, for example, a person has formulated a text that expresses a longing for union without associating this text with the typical affect terms (e.g., love and tenderness) (Van Geel, 2000). These so-called “discrepancies between text and affect” reflect a tension between the explicit and implicit level of meaning. In some cases, resolving these tensions is the crux of SCM counselling. Recently, a new line of research has been
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initiated, exploring the possibility to supplement the usual SCM affect (and behavioural) scales with “idiographic attachment scales”. In research on romantic relationships using self-report measures, two fundamental dimensions of insecure attachment have been revealed (e.g. Brennan, Clark, & Shaver, 1998): (a) attachment anxiety refers to the oversensitivity to clues about abandonment, separation and rejection, and an exaggerated need for reassurance, attention and support; (b) attachment avoidance includes discomfort with closeness and dependency, distancing from others and denial of attachment needs. According to Mikulincer and Shaver (2007) these dimensions expose two different (implicit) strategies to deal with insecurity and distress when a security-providing attachment figure is unavailable or unresponsive (see also Dewitte, 2008; Turan, 2009). Integrating these kinds of attachment scales with idiographic clinical counselling methods like the SCM, may deepen our understanding of people’s motivations and allied problems in (intimate) relationships.

How do people deal with the effects of the interaction between explicit and implicit strategies for action?

As described earlier, the tension between implicit and explicit strategies for behaviour is part of the ‘condition humaine’. However, it is clear that this tension sometimes goes beyond the individual’s resources, resulting in psychopathology. Several theoretical frameworks are used in order to explain how people cope with the discrepancies. A prominent model in the field of clinical psychology is the vulnerability-stress model of psychopathology (Hankin & Abela, 2005; Nuechterlein & Dawson, 1984; Zubin & Spring, 1977). This model integrates theoretical and empirical perspectives from several areas such as genetics, neurobiology, psychology and behavioural sciences. According to this model, psychological and/or psychiatric symptoms will emerge whenever a threshold of stressors exceeds the individual’s vulnerability level. The model of the International Classification of Functioning, Disability and Health (ICF) classifies health and health related domains that describe body functions and structures, activities and participation. As mentioned above, the individual’s (dys)functioning occurs in a context, therefore, environmental factors are also integrated in this ICF-model (WHO, 2001). Other theoretical models underlying clinical research are the biopsychosocial model (Sperry, 2008) and the model of self-definition and relatedness (Luyten, 2006).

The strategy of investigating individuals at a lower level of the continuum turns out to be advantageous as it avoids potential confounds inherent to clinical patients, such as institutionalisation and side effects of medication (Claridge, 1994). In addition, since the prevalence of subclinical symptoms is much higher than the prevalence of the clinical disorder, it is easier to discover variability in subtle processes underlying the phenotype of the clinical disorder. Most promising is the convergence of the “continuum model” with the implicit – explicit dimension. This offers more room for an interpretation in which “normal” strategies can lead to pathological behaviour (subclinical or clinical) due to problematic interactions. In other words it can be rational to react abnormally in abnormal situations.
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Thus, research in the field of clinical psychology is gradually shifting from a purely categorical syndrome-oriented approach to a dimensional, and even more specific, symptom-oriented approach (e.g. Bentall, 2004). This symptom-oriented approach has the advantage that it offers a way to investigate the clinical concept without accepting the traditional Kraepelian model. Over the last two decades, this approach has facilitated greater theoretical understanding of implicit psychological mechanisms.

Therefore, much of the research oriented at psychopathological behaviour investigates the implicit and explicit behaviour strategies in samples of the general population by using a symptom-oriented approach.

*How much room is there for changing these strategies in the diversity of situations that people come across? How can human environments be (re)designed to release this tension?*

The nature-nurture question in the field of clinical psychology is an old debate with changing positions. During the last decade of the previous century, much effort was dedicated to estimate the heritability of psychiatric disorders and to try to identify the associated genes (Jacobs, 2005; Jacobs, et al., 2007; Jacobs, et al., 2002; Jacobs, Rijndijk, et al., 2006; Jacobs, et al., 2001; Simons, Jacobs, Jolles, Van Os, & Krabbendam, 2007). However, instead of ‘finding the holy grail’, which was believed to be found in the mapping and sequencing of the whole human genome, this quest led to a conclusion far beyond the nature-nurture dichotomy. It has been realized that genes or broader defined as ‘biology’, (nature), and environment (nurture) are not two separate and independent causal factors of psychopathology, but that they can correlate and interact (Jacobs, 2005).

Part of the research questions in the present programme are aimed at bringing these two points of view together, with explicit attention to the biological foundations of both behaviour in general (see below) and psychopathology in particular. For example, there is a good and growing body of research focusing at the pathological aging of the brain. Older people are confronted with a decline in various cognitive and bodily functions. In particular, the cognitive control functions that inhibit automatic, implicit processes become less efficient (Phillips & Henry, 2008; Van Hooren, Valentijn, Bosma, Ponds, Van Bostel, Levine, et al., 2007) and this is even more pronounced in patients with degenerative psychopathological diseases, such as Alzheimer’s disease. These control functions enable independent, purposive, self-serving behaviours and therefore are crucial when confronted with new situations in daily life (e.g learning to deal with new electronic devices). Moreover the decline of control leads to situations susceptible to stigmatization, thereby enhancing isolation and stress. Behavioural support for the age related cognitive decline is supported by neurobiological evidence. Brain regions responsible for the control functions are more sensitive to the aging process than other regions (e.g. (Tisserand, et al., 2002).
Human environments may be redesigned to release tensions between implicit and explicit strategies, or to support mutually enhancing interactions. Recent studies have shown that older adults reporting cognitive complaints benefit from interventions directed at the control processes (e.g. (Ball, et al., 2002; Van Hooren, Valentijn, Bosma, Ponds, Van Boxtel, & Jolles, 2007). During these interventions participants learn to use explicit strategies such as being aware of their current state of affairs, selecting the appropriate goal and checking their behaviour with the goal state. Mindfulness interventions also focus on the use of explicit strategies, by redirecting routines and automatic behaviour to conscious mental processes.

Mindfulness-Based Stress Reduction (MBSR) is an example of an intervention programme that aims to improve psychological well-being. The MBSR programme is a training course focusing on learning how to relax attentively and to accept things as they are (Kabat-Zinn, 1990). Although the MBSR programme was originally developed for patients suffering from the stress and pain of physical complaints, it was later also examined and used among patients in all kinds of other medical settings. The MBSR programme was reported to be effective in treating chronic pain, anxiety and panic disorders, fibromyalgia, psoriasis, and several cancer-related psychosomatic complaints (Carmody, 2009). In a recent study among persons who stutter, De Veer, Brouwers, Evers and Tomic (2009) found that immediately after participating in the MBSR programme and four weeks later, stutterers appeared to suffer less from stress and related complaints, showed less anxiety about speech situations, displayed more confidence in approaching speech situations, felt more in control of life events, and increasingly used a decisive problem-oriented coping style. This is a challenging notion, because it also may have implications for the transition of individual cases on the continuum of psychopathology.

Another example of research that profits from the explicit-implicit approach is the study of traumatic brain injury. In line with the ICF model, functional outcome or recovery after traumatic brain injury is a multilayered concept that is determined by a variety of biological, sociodemographic, and environmental factors. Investigating determinants of long-term outcome or recovery is pivotal in providing a global perspective of possible outcomes that may help patients and their families to cope with the new situation and anticipate the future. In this respect a variety of possible prognostic factors were systematically reviewed, including socio-demographic factors, pre-morbid co-morbidity, injury characteristics, neuro-psychological factors, treatment factors, and post-acute functionings (Willemsen-van Son, Ribbers, Verhagen, & Stam, 2007). In addition, mechanisms remaining implicit for patients like genetics are considered relevant for the recovery after traumatic brain injury; the polymorphic Apolipoprotein E gene might be a contributing factor for predicting outcome after traumatic brain injury (Teasdale, Nicoll, Murray, & Fiddes, 1997; Willemsen-van Son, Ribbers, Hop, van Duijn, & Stam, 2008; Zhou, et al., 2008). Also implicit strategies, like previous habits, seem to play a role; the amount of pre-injury participation in the community was found to be related to the level of post-injury community integration (Willemsen-van Son, Ribbers, Hop, & Stam, 2009). More precise information about what the future may bring may help patients and relatives in the adaptation process and will enhance efficacy of the rehabilitation process. Because of the acute character of the injury, patients tend to underestimate the consequences of the injury and expect a full recovery.
Patients might therefore cling on to old cognitive interpretations that can be unrealistic or even counterproductive. For instance, due to sickness insight, or lack of awareness of possible care facilities, patients did not recognize all their healthcare needs (Pickelsimer, et al., 2007). Learning about the nature of the injury and possible treatments, may stimulate patients to learn new explicit strategies to enhance their recovery. The utilisation of health care facilities was also related to implicit or explicit health beliefs. Patients with a high locus of control with the physician were more likely to visit medical specialists than other patients, despite comparable health-related factors and patients with a high internal locus of control were more likely to use supportive care than other patients, despite comparable health-related factors (Willemse-van Son, Ribbers, Stam, & van den Bos, 2009). In the future, professionals might pay more attention to the influence of implicit health beliefs on healthcare utilisation, which might prevent some patients failing to receive the care they need because of their health beliefs.

Using ESM (see above) a number of studies have documented that daily life stress is associated with increased negative affect (NA) and decreased positive affect, as well as with increased cortisol levels (Jacobs, et al., 2007; Jacobs, Rijsdijk, et al., 2006) Even more, implicit affective processes in daily life such as stress reactivity, have been linked to depression as well as psychosis (Lataster, et al., 2009; Wichers, Geschwind, et al., 2009; Wichers, Jacobs, Derom, Thiery, & Van Os, 2007; Wichers, Myin-Germeys, et al., 2008; Wichers, Myin-Germeys, et al., 2007b; Wichers, Peeters, et al., 2009). Neuroticism, one of the most important risk factors for psychopathology, was found to index an environmental risk for decreased daily life positive affect levels and a genetic as well as an environmental risk for increased NA variability in daily life (Jacobs, et al., in press ). Recently, scientific attention has been drawn to the concept of resilience in the field of psychopathology. Wichers et al found that positive emotions buffer against NA reactivity. In addition, positive emotions are found to reduce the expression of the genetic vulnerability for negative mood bias in daily life (Wichers, Aguilera, et al., 2008). A recent study using ESM showed that reward experience, or the ability to generate positive affect boosts from pleasant daily life events, preserves mental health, but only in case of high childhood adversity or recent stressful life events. High daily life reward experience may thus represent a mechanism of resilience in subjects at risk for affective(Geschwind, et al., 2010). In addition to affect, stress reactivity and reward experience, also self-esteem has been studied in the context of daily life. Instability and fluctuations in daily life self-esteem were found to related to subclinical paranoia (Thewissen, et al., 2010; Thewissen, Bentall, Lecomte, Van Os, & Myin-Germeys, 2008; Thewissen, et al., 2005; Udachina, et al., 2009).

In our faculty, the ESM method is currently being applied to study the effect of implicit processes such as affect, stress reactivity and self-esteem in relation to psychological well-being in young families. Recently, research based on the ESM method has been set up to investigate the implicit, contextual daily life determinants associated with addictive behaviour such as emotional eating and smoking. In addition, this method is applied to study the effect of implicit processes such as affect, stress reactivity and self-esteem in relation to psychological well-being in non-clinical populations, such as parents of young families. Getting insight into the relation between daily hassles, stress reactivity and affect in a non-clinical population helps understanding the implicit and explicit processes that may contribute to the development of mental disorders like depression.
The interaction between explicit and implicit strategies for behaviour

And furthermore, there is a well-established line of research (in cooperation with Maastricht University) focusing at gene-environment interactions in psychopathology (Jacobs, Kenis, et al., 2006; Schreurs, et al., under review; Wichers, Aguilera, et al., 2008; Wichers, Kenis, et al., 2008; Wichers, Myin-Germeys, et al., 2007a, 2007b; Wichers, Schrijvers, et al., 2009).

In addition, research in which the ESM (see above) is investigated as an intervention tool in the field of emotional eating and smoking cessation has been initiated in cooperation with health psychology staff members.

Psychological processes that implicitly and/or explicitly guide social exchange behaviour

As a sub domain of psychology organisational psychology studies human behaviour in the context of organised labour and work. Human behaviour is studied on the level of the individual, the group and the organisation as a whole. Social psychology is the most important theoretical pillar of organisational psychology. There is also input from personality, developmental, and cognitive psychology. In addition to the technical environment it is the social environment (as such or in interaction with the technical environment) that determines to an important degree the behaviour of individuals and groups in organisations. Relations between individuals, groups, and the organisation (or society) are conceived of as social exchange relations. An important question, then, is: what explicit and/or implicit processes guide the social exchange behaviour of individuals (and groups) in relation to other individuals, groups they are involved in, and the institution of which they are a member?

Research efforts of the psychology department emphasize both practical and theoretical aspects of social and organisational psychology, especially in relation to implicit and explicit strategies for social exchange behaviour. As an important phenomenon in social collectives, ranging from the dyadic to the societal level, the study of social exchange has been applied to areas as diverse as just World processes, organizational justice, compliance with authorities, and bullying. To accomplish this, researchers combine research methods as diverse as laboratory experiments, large-scale social surveys, and observational research designs to approach research questions from different angles.

Five projects concern questions regarding implicit and explicit strategies for social exchange behaviour:

- The irrationality of deservingness: Just world processes and reactions to senseless violence
- Integrating organizational justice into job (re)design theory
- Compliance with authorities
- Bullying at work and in schools
- A fair characteristics model of organizational justice

THE IRRATIONALITY OF DESERVINGNESS: JUST WORLD PROCESSES AND REACTIONS TO SENSELESS VIOLENCE

This project was initially based on Lerner’s Just world hypothesis (JW) that states that people have a drive to see the world as a just place where everyone gets what he/she deserves and deserves what he/she gets. Instead of showing compassion toward victims of violence, it was often found that victims were derogated and blamed, thereby preserving the belief in a just world. One of the main questions in this project was whether these JW processes also apply in situations where a person was confronted with a victim of a (severe) senseless violent act. The project’s aim is to find out under which conditions JW processes operate, and to study implicit mediating and moderating processes that explain persons’ reactions faced with victims of senseless violence.
INTEGRATING ORGANIZATIONAL JUSTICE INTO JOB (RE)DESIGN THEORY

The main questions guiding this project are: in what way and to what extent do justice judgments influence the relationship between work characteristics and work behaviour in organizational settings? And to what extent do job (re)design professionals have to take implicit aspects of justice explicitly into account while developing and implementing their interventions? This projects integrates aspects of organizational justice into existing models that explain the effects of work characteristics on work outcomes such as stress, burn-out, work engagement and motivation (e.g. Conservation of Resources Theory; Hobfoll, 2002). The main assumption of this research is that justice judgments play an implicit role in the decision of workers to invest or not to invest resources in order to achieve work goals. Investing resources entails the risk of resource depletion, making the worker vulnerable.

COMPLIANCE WITH AUTHORITIES

Authorities generally adopt explicit strategies such as deterrence to stimulate compliance with their rules among citizens, especially when self-interest motives are relevant. The idea behind this strategy is that sanctions counterbalance the profits that could be gained by people who transgress the rules. This explicit strategy cannot fully explain the high levels of compliance of citizens. It is assumed that norms such as fairness norms, implicitly held by citizens, are strong determinants of their compliance, and these implicit norms interact with the explicit strategy.

BULLYING AT WORK AND IN SCHOOLS

One of the main questions of the mobbing at work studies is aimed at gaining insight into the explicit and implicit reasons why bystanders refrain from helping a victim, or even join in with the mobbing, that is, why bystanders tend to help or hurt the victim. The studies focus on the intervening role of explicit (rational) attribution processes to affect these responses, but also on intervening implicit processes that may temper the assumed strong influence of these rational attributions. The role of these explicit attributions are put forward in Weiner’s (Weiner, 1995, 2006) rational-normative attribution model. The implicit processes that supposedly influence the rational attribution sequence are threat of contagion, estimated effect danger ratio, perceived justice of mobbing, and identification with the victim.

FAIR CHARACTERISTICS MODEL OF ORGANIZATIONAL JUSTICE

It is expected that fair procedures and fair interactions will increase overall fairness in social institutions, and thus distributive fairness, which consequently will contribute to employee and citizen well-being, and overall effectiveness of these institutions. It is assumed that the effect of organizational structure, procedures and distributions on well-being and effectiveness is mediated by fairness perceptions, which are often implicit. This assumption is the basis for our Fairness Characteristics Model (FCM) that is modelled after the Job Characteristics Model of Hackman and Oldham (1976). This model allows for studying diverse policies and decision making systems in different organizations by which valuable resources are allocated or distributed among organizational members and groups (e.g. reward systems, performance appraisal and review, personnel selection, promotion policies, ...)

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The interaction between explicit and implicit strategies for behaviour

Common themes of the projects are: (1) behaviour is guided by shared implicit and/or explicit norms, rules, beliefs, values that are characteristic for the exchange situation; (2) the behaviours under study are partly rational, controlled (explicit), partly irrational, automatic (implicit); (3) that psychological processes unconsciously intervene between situational cues and (automatic or controlled) behavioural responses, and (4) perceived fairness plays, mostly implicitly, a crucial role in all explanations.

In our answers to the three main questions of the research program, we will present some illustrations of the assumed interplay between implicit and explicit aspects of the situations and behaviour that are studied in the different projects.

*Which explicit and implicit strategies do people use in social exchange situations? And how do people deal with the discrepancies between the explicit and implicit strategies for action?*

Explicit norms dictate that people should show prosocial reactions towards victims of violence (senseless violence, bullying), such as compassion and help. Research shows that such explicit positive reactions do not always occur (see bystander effect). Instead, research shows that victims undergo secondary victimization: they are derogated, blamed, condemned and sometimes rejected (see, e.g. Lerner, 1980). These negative reactions can be seen as a defensive just-world preserving process, based on an implicit belief in a just world that is threatened by being confronted with grave injustice. Confrontation with grave injustice done to others can also lead to rational, explicit behaviour such as participating in silent marches. In our research JW-conditions are created by using explicit instances of violence which are supposed to trigger implicit, intervening processes that differentially influence people’s rational (explicit) and/or irrational (implicit) reactions towards victims and offenders. The implicit processes studied are derived from the Sacred Value Protection Model (Tetlock, 2003), Terror management theory and mortality salience (Landau, et al., 2004) and disassociation (Lodewijkx, 2008).

Bystanders of mobbing incidents can help or hurt the victim. These responses are affected by an explicit, rational attribution of responsibility and by intervening implicit processes. Bystanders are assumed to implicitly perform a cost-benefit analysis of alternative actions, before choosing to act positively or negatively. Helping or hurting is also dependent on the implicitly perceived threat of contagion: helping a victim could stigmatize the helper “by association”, and by the perceived injustice done to the victim. The explicit attribution process seems to be less rational than proposed by Weiner (2006) (Alicke, 2000): people implicitly (heuristically) tend to exaggerate volitional control of the victim, and to seek for information that supports their implicit blaming attributions.

Compliance with authorities (e.g. paying taxes without fraud) seems to be more dependent on the implicitly held notion of fairness of the authority, than on explicit deterrence strategies of the authorities. Perceived fairness of the authority almost automatically leads to increased legitimacy and trust, which is an important factor for explaining compliance.

In our research concerning the relation between work characteristics and work related outcomes (e.g. well-being, exhaustion, engagement) the implicit sense of (in)justice people have about their
The interaction between explicit and implicit strategies for behaviour

relation with the employer, will be incorporated in the Conservation of Resources theory (COR) (Hobfoll, 2002). COR states that resources – among other – enable the owner to cope more effectively with threatening circumstances, by increasing the use of these resources. At the same time however, increased use of job and personal resources might lead to resource depletion, making the owner vulnerable in his/her relation with the employer. Perceived fairness of the employer leads to trust in the employer that he will not take advantage of the weakened position of the owner (employee). It is expected that in case of a fair or just relationship between the exchange partners, employees will be prepared to accept a greater risk of resource depletion.

In the fair characteristics model, different fairness judgments (distributive, procedural, interactional and informational) are expected to mediate the relation between characteristics of organizational allocation procedures and work related outcomes (satisfaction, commitment, turnover,…). Fairness can be triggered by explicit cues (e.g. reward allocations, having voice) but many of the processes involved are mostly implicit, such as social comparison, attributions of responsibility. If fairness judgments are made explicit, they implicitly refer to a conflict between the allocating authority and the receiver of the outcomes (Syroit, 1984). Restoration of justice implies the resolution of the conflict in either a direct, rational, explicit way, or through an indirect, more implicit strategy (e.g. being less committed, sabotage, …), aimed at convincing the exchange partner of his/her unjust act.

**How much room is there for changing these strategies?**

In the cases of social exchange relations, as e.g. between citizens and public authorities and between employees and employers, authorities and employers should make it very explicit that they strive toward fairness. This can be realized by adopting fair procedures, e.g. by applying the fair procedural rules suggested by Leventhal (1980), by applying insights from interactional and informational justice research (account giving, openness, showing consideration), and by training those who interact with employees and citizens toward fairness.

**Life Long Learning**\(^\text{11}\)

**IMPLICIT LEARNING IN DAILY LIFE**

Reber (1993) defined implicit learning as “the acquisition of knowledge independently of conscious attempts to learn and in the absence of explicit knowledge about what was learned”. Sometimes, this situation is referred to as tacit, episodic, non-formal or non-deliberative learning. It may include the instant remembering and evaluation of earlier experiences in actual events, routine-like enactment of behaviour (habits), non-conscious norm or rule following, intuitive or heuristic decision-making, and so on. Although such patterns in the behaviour of individuals can often be observed, the difficult question to be answered is how these regularities were acquired. People may find it hard or impossible to account for their behaviour, or they are even unaware of their patterned conduct. In contrast to explicit or deliberative learning, then, implicit learning typically lacks prescribed learning contexts, methods, teachers, goals, and assessments.

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\(^\text{11}\) The following section is duplicates to a certain degree the first part of the research programme Line 3 of NELLL, authored by Theo Verheggen, programme leader of NELLL Line 3. It reflects the converging approaches of the psychology programme and the LLL-programme.
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The problems studying implicit knowledge and learning are rather obvious: how to recognize what is implicit? How to make the implicit visible? Can implicit learning and implicit knowledge be made explicit at all, without losing their defining features and functions? Whatever logical it may seem to search for verbal or written accounts in order to reveal implicit knowledge structures and unobtrusive learning strategies, much of what is searched for is in fact non-propositional or non-semantic in nature. It is one thing to theorize about one’s actions or the actions of others, it is often another thing to establish how those actions really came about. Tomlinson (1999) argues that as a result of many years of experience, professionals may just know the right thing to do. The intuitions and feelings they have developed may not even become part of their own perception of the facts.

To simply rely, then, on accounts by respondents who try to introspect into their motives for behaviour and thoughts about what they will do, is questionable indeed. Without some training, they may altogether lack the skills to accurately reflect on their actions. Respondents' accounts can quickly become ad-hoc rationalizations or wishful representations of how they learned and how they acted as they did. A similar idea is refracted in Argyris and Schön’s (1974) distinction between theories in use and espoused theories. The latter refer to the ideal way of perceiving and rationalizing the situation while the former entail experientially developed heuristics and maxims that are on the verge of being made explicit.

Moreover, accounting serves more social functions than just the internal representation of a true state of affairs in the world. Respondents may convey all sorts of meanings in their accounting, such as making sure they will be liked, showing who is in charge, expressing their moods, or revealing their underlying intentions. Interview and observation techniques in discursive psychology or conversation analysis sometimes reflect awareness of these different social functions. Their methods help to turn implicit meanings and strategies in accounting into the very theme of research. Discursive and narrative approaches may therefore provide a valuable framework for studying implicit learning and implicit knowledge, thus supplementing research using approaches that assume explicit strategies for behaviour. In addition, biological processes and states, such as hormone and blood sugar levels, clinical pathology, and genetic endowment may unwittingly affect people’s perceptions, cognitions, decisions and accounting. We will return to these research issues below.

Eraut (2000) has cogently summarized the perspectives on the wishful and actual descriptions of a state of affairs, adding that “[k]nowledge of contexts and organizations is often acquired through a process of socialization through observation, induction and increasing participation rather than formal inquiry. Thus norms, local discourse and other aspects of an organizational or occupational culture are acquired over a significant period of time by processes which implicitly add meaning to what are explicitly interpreted as routine activities.”
The interaction between explicit and implicit strategies for behaviour

For our purposes, this contention is important in two respects:

- First, it orients our attention to implicit learning as part of the everyday cultural settings in which people partake.
- Second, it sensitizes us to not confuse perceived regularities in behaviour (such as routines and norm-following conduct) with the mechanism that actually led to those regularities in behaviour (such as observing, imitating, and participating).

**Patterns in behaviour (habits, routines) and implicit normativity**

These two observations are the central concern in theories of behaviour and cognition that attempt to account for the production of patterns in the behaviour, feelings, and cognitions of people as members of an intrinsic social group\(^{12}\) (Baerveldt & Verheggen, in press; Greenwood, 1994; Voestermans & Verheggen, 2007). One of the key notions in such a framework is mutual coordination of actions (Baerveldt & Verheggen, 1999; Fogel, 1993; Maturana & Varela, 1987). This entails the ongoing tuning of one’s behaviour to that of others, which is an immanent task for every member of the group – hence ‘mutual’ coordination or tuning. The proper metaphor would be a dance, not necessarily instruction or explicit command. People usually do not coerce one another into a course of actions, but ‘invite’ or ‘accompany’ one another into a conversation or into a chain of actions (cf. Merleau-Ponty, 1963). The notion of ongoing mutual coordination of actions tries to capture the implicit manners in which most everyday social interactions unfold. In the research programme of psychology this is considered as an alternative approach that might help in finding other ways of explaining and intervening behaviour in daily life, especially in matters of health, mental health, social exchange.

It is an important assertion in such an approach that, in the eyes of observers, behavioural patterns result from the ongoing mutual coordination of actions between people. People’s patterns in behaviour, then, are primarily the consequence of their embodied coordinated actions within a community of actors, instead of being the result of individual motor programs that run from shared mental instructions or cultural prescriptions.

In popular discourse, in politics, but usually also in the social sciences, it is argued that people become members of a cultural group when they internalize the prevailing norms and values of their society. It is thereby tacitly assumed that these norms are somehow present in the collective and that they can be (predominantly) mentally appropriated. In the recent re-evaluation of phenomenological accounts of experience and normativity in biology, cognitive and social science, and philosophy (Dreyfuss, 1992; Gallagher & Zahavi, 2008; Maturana & Varela, 1987; Noë, 2009; Thompson, 2007), often referred to as ‘enactive theory’ or ‘enactivism’, the dominant metaphor is seriously challenged, arguing instead that norms cannot be pre-given to the people in a community.

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\(^{12}\) Intrinsic social groups (Greenwood, 1994) are real operative groups in the sense that their members communicate, have different roles, share agreements, conventions and arrangements. A family, colleagues at the work place or a soccer team are examples of intrinsic social groups. They are contrasted with aggregate groups which are constructed by people—often researchers—on the basis of a common feature that people share, e.g. being women or Catholics. Most often, such ‘groups’ have no significance in daily life. Many similar distinctions occur in the literature under different names.
Instead, people already behave and feel in group-typical ways, such that regularities or norm-like patterns can be derived from observing their behaviours.

The question that remains is how these typical ways of behaving and feeling came about. As stated above, we look for answers in the embodied, mutually coordinated actions in which people are continually involved. This will involve, among others, imitation and emulation of behaviour (Tomasello, 1999), trying, practicing, making mistakes, thinking things over, receiving feedback and being corrected, trying again, refining, and so on. It is important to understand, however, that the resulting patterns in behaviour cannot account for the behaviour from which they were derived in the first place. This rather counterintuitive argument is also addressed by Eraut (2000): “[Implicit theories] are seldom explicitly stated by the knower but used by psychologists to explain his or her behaviour. Those observed behave as if they believed the implicit theory imputed to them” (p. 122, our emphasis).

It can of course be argued that surely humans do have norms or rules that determine how people behave, as members of a group to which these norms and rules apply. That statement is only metaphorically apt, however. Even in the case of explicit rule following, what remains to be understood is where the ‘normativity’ of the rule stems from. After all, its incentive cannot simply stem from a line of ink on a paper, nor can it stem from the mere power of spoken words. As already Wittgenstein argued, we can only understand a rule as the explication of an underlying social practice. Normativity, then, has to do with the way people’s behaviours and feelings became structured in accordance with the behaviours and feelings of their parents, peers, and other significant others. In addition, the structuring principle is not to be found outside of people (for instance in ‘culture’), but precisely in the ongoing process of what is often referred to as ‘socialization’.

Social constructionism (e.g. Berger & Luckman, 1967) as well as social constructivist thinkers such as Vygotsky dealt with similar issues, and both frameworks entail significant learning theories about the individual in a social context. In both cases, however, the significant meanings are supposed to be already present socially, and they subsequently need to be internalized, shared, or otherwise appropriated by novices. When the focus is on implicit learning, as is currently the case, the often non-propositional nature of what needs to be learned or acquired poses a problem to constructivist or constructionist theory. An enactive approach to cognition and meaning making (see Varela, Thompson, & Rosch, 1991) is sometimes close to social constructivist/constructionist theme’s and thought, yet appears to be better equipped to emphasize the implicit learning of skills, practices, as well as their inherent normativity.

On the basis of the aforementioned developments, Voestermans and Verheggen (2007) have argued how the ill understood notion of socialization—or the equally ill understood notion of culture—can be
The interaction between explicit and implicit strategies for behaviour

dissected in a number of concepts. According to the authors, socialization (or culture) is basically the implicit acquisition (learning) of a patterned behavioural repertoire (including knowledge and skills) within a group. Moreover, they have argued how there is an intrinsic, implicit, and situated normativity to those behavioural patterns (see also Baerveldt, 2007; Rietveld, 2008). Thirdly, these concepts are liable to research.

In order, then, to come to grips with the implicit learning and implicit knowledge entailed in (the acquisition of) everyday practices, whether in a private or professional context, research should aim for the following:

1. Individual behaviour largely depends on common practices in a group, rather than on conscious individual motives that are propelled by some interior motivating system. Therefore, the focus needs to be on what goes on between people, in terms of the ongoing mutual coordination of their actions.

2. This ongoing tuning can acquire a rather stable character for the participants, recognizable as patterns in their behaviour. These patterns manifest themselves as routines, habits, or automaticities in the behaviour of a person. These routines have to be understood as embodied practices or skills. It implies a focus on the unobtrusive training, by means of which these skills are adopted and refined.

3. Not only outward behaviour, but also feelings, cognitions, and in part even the senses become socially tuned within local communities of already skilled practitioners. Learning to play golf, to taste and discriminate wines, to make jokes, or to develop a feeling for the proper thing to say or do; they are all examples of behaviours, feelings, and cognitions that were practiced (trained) and refined in the community of already skilled practitioners.

4. Embodied practices are normative practices, precisely because they involve attuned feelings of right and wrong, proper and misplaced. Explaining why a joke was funny or why it was not, is often beside the point. The crux is to be found in the socially coordinated feelings of appropriateness and surprise. Because feelings too become attuned to what already experienced practitioners (members) of the group do, the ‘ways of the group’ become both a matter-of-course and, in a sense, compelling to the novice. People’s accents are a good example of the obviousness and naturalness of characteristic patterns in the group, which—through sometimes explicit but largely implicit training—become part and parcel of people’s embodiment and identity. At the same time, it is difficult (though not impossible) to change or get rid of the once acquired accent, revealing how persistent, authentic, and compelling these practices can be; again, precisely because they are embodied practices. The same is true for the other embodied practices that social life is chock-full of.

5. The acquisition of embodied normative practices always occurs in a social and physical setting. Apart from understanding the explicit rules and the implicit conventions of a social group, it is important to understand how the physical environment facilitates, shapes or obstructs the behaviour of individual learners. The classroom is an obvious example, but architecture (think of the implicit routing in airports or supermarkets) or physical arrangements in a house or an office may also contribute to the acquisition and prolonging of behavioural patterns. For instance, in their new homes immigrants often tend to reconstruct the living situation as it was in their countries of origin, and in some formal organizations the positions of the desks or the (in)accessibility of the chiefs offices reveal...
The interaction between explicit and implicit strategies for behaviour

how the social relations are organized. Such arrangements are important in understanding how behavioural styles become shaped and regenerated.

**IMPLICIT LIFELONG LEARNING IN PROFESSIONAL LIFE**

Lifelong learning may help improve one's professional position and career opportunities; it may serve as a source of health, buffer against stress, or be a goal in itself by enriching one's life. Behavioural patterns of living and working must therefore adapt to the opportunities and challenges that occur in societies that promote or require lifelong learning.

In addition, all sorts of new actors, pedagogies, and content are entering people's education field. This often happens implicitly, for instance through new media that people use daily and routinely. Such new developments can blur the division between providers and users (Davis & Meyer, 1998). Currently, arrangements and opportunities to learn are provided by all kinds of open educational resources, serious and persuasive games, social software/Web 2.0 such as blogs and wikis, search engines, interactive websites, mobile technologies, and so on. In these cases, 'learning' does not only refer to learning content. It is also entailed in the practice of finding information, in how to use social media, how to proceed on a forum with reference to other users, how to assess the quality of the retrieved information, and so on. It is this type of learning that often remains rather implicit.
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PSYCHOLOGY PROJECTS IN LIFELONG LEARNING LINE 3 (PERSONAL AND PROFESSIONAL DEVELOPMENT: IMPLICIT LEARNING AND IMPLICIT KNOWLEDGE)

Currently, the contributions of psychology are the following:

| PSY_NELLL #1 | Learning reduces stress, stress inhibits learning (see below) | John Taverniers | B, D | Survey, cognitive tests, EMG's, stress hormone levels | Professional | LLL-funding CVB and the Belgian National Army | 2012 |
| PSY_NELLL #2 | Evaluation Wikiwijs-project. The use of open educational resources (see below) | Hans van Buuren & Frederick van Acker | D | Survey and interviews among teachers | Professional | Ministry of Education and Science | 2013 |
| PSY_NELLL #3 | Context-dependent determinants of stress, self-esteem and psychopathology (see above) | Nele Jacobs, Viviane Thewissen | B | Experience Sampling Method | Personal | Faculty | - |
| PSY_NELLL #4 | Group formation and social tuning in first class high school | Petra de Bil | A, C | Longitudinal research: observation, video registration, discursive interviews, sociograms, frame analysis | Personal | External promovendus | 2011 |

PSY_NELLL #1 Learning reduces stress, stress inhibits learning

In this project the robustness is tested of a research model, based on the Job Demands-Resources model. The aim is to find empirical evidence on the context independence and generalizability of the main and interaction effects in the model. Results of model testing are compared both in time and between both regions. Results show that job demands induce and job resources reduce work related stress.

Implicit and explicit strategies at work: the educational use of ICT

This project investigates the role of implicit and explicit strategies used to learn new behaviour or to display newly learned behaviours in work settings, specifically behaviour related to ICT use in educational settings. The research is closely related to the Wikiwijs project which will provide funding until 2015 for several researchers in a multidisciplinary team. Since over two decades ago ICT was introduced into classroom practice it has gained much attention and ever growing confidence in its effectiveness. ICT is believed to be more than the core of the Information Society. It is supposed to be paramount to the education of knowledge workers (Pelgrum, 2001). Although benefits of ICT use in education have been acknowledged (Hayes, 2005; Vichitvejpaisal, et al., 2001) teachers do not seem to integrate it into their teaching activities (Cuban, 2001; Varank & Tozoğlu, 2006; Yang & Huang, 2008). In the current research project the discrepancy between the explicit knowledge about advantages of using ICT in education and the lack of ICT in classroom practice will be further investigated A number of questions must be answered:
o If teachers have explicit knowledge about the advantages ICT offer in educational practice, why does their behaviour point in the other direction?

o Which implicit factors (contextual or dispositional) inhibit the use of computer-related technology in education?

o Do social norms and other effects of the consensual coordination of behaviour between teachers and/or between teacher and pupils play a role?

o Which external circumstances moderate the learning of new behaviour related to ICT use?

o How should the environment (schools, policy and stakeholders) be (re)designed to stimulate such behaviour.

RESEARCH THEMES AND METHODS FOR LINE 3 (IN PSYCHOLOGY)

Even within a focus on implicit learning and tacit knowledge, several different learning situations can occur. We already addressed ‘on the fly’-learning in daily taken-for-granted situations, as well as habit and routine formation. Apart from these, people may learn implicitly from recollection of previous experiences and knowledge, which they apply in new situations, or they may use rather implicit heuristics and maxims in their style of behaving — in both private and/or professional life.

In the perspective of Line 3, and in addition to the central tenets in other Lines of the NeLLL-program, learning is not so much seen as an individual mental accomplishment. Likewise, in Line 3 knowledge is not so much conceived of as the mediating material between a situation and a person’s performance. Rather, time and again the analysis centers around the implicit acquisition of normative behavioural patterns as a member of an intrinsically social group.

Obviously, this does not imply that in the end there is no personal touch to knowledge and learning. Individual biographies and learning histories imply that ‘knowledge’ will be different for virtually every single person, even if that knowledge was acquired in the same learning situation. As Eraut (Eraut, 2000) observes, this point is often overlooked in the learning literature. Moreover, the author argues that a situation can occur in which the learning may be explicit while the learning situation itself is spontaneous or unintended. He refers to this as reactive learning, as a third alternative next to explicit and implicit learning. Such theme’s are important, and could become part of the research program in Line 3.

Making tacit knowledge explicit and tangible is difficult, even for the persons that are believed to possess this knowledge. Researchers cannot simply assume that verbal or written accounts of the subjects under scrutiny reflect truly and honestly how their behaviour came about. There will be problems interpreting the data, as well as insecurity whether all aspects of the implicit learning situation could be captured. In such a case, applying several different research methods (triangulation) may help to investigate the implicit acquisition and use of knowledge in all sorts of personal and professional situations.

Qualitative research such as (participant) observation, discursive and narrative analyses of interviews, social network analysis, as well as relatively new research techniques such as the Experience Sampling Method (ESM)\(^\text{13}\) have proven to yield important information about people’s

\(^{13}\) ESM is a method in which an electronic device, such as a watch or smartphone, randomly emits a number of signals during the day. At these instances, respondents fill out a short questionnaire about their actual situation, the experienced
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functioning, without these subjects being aware of the patterns and correlations observed. Such techniques are suitable to augment research methods that are more common, including large-scale surveys and laboratory experiments. Subsequently, qualitative or ESM findings add to the body of scientific knowledge with respect to phenomena that were already studied using more traditional research approaches in the behavioural sciences.

Corresponding to the five focal points in the perspective on implicit learning as presented above, the following research themes (A-E) are formulated, including possible research methods and suggested literature.

stress, other feelings, cognitions, and so on. The data yield insight into the daily circumstances under which certain behavior patterns (such as smoking, binge-eating, worrying, etc.) occur. The research data may be enriched by taking biometric measures, e.g. cortisol levels in the saliva. The results help to understand the context-dependent determinants of behavioral patterns and everyday practices, and they help to design tailored intervention programs.
Concluding remarks

The research programme *The relation between explicit and implicit strategies for behaviour* of the psychology department increases the integration with the OUNL research programme on Life Long Learning. Many research questions as well as answers in the present psychology programme touch on, if not overlap with the questions that can be put in the overarching LLL programme, especially in line 3 (Personal and professional development). The focus is on implicit learning, especially the continuous tuning of strategies for behaviour in a number of core values in personal and professional development: personal health, mental health, fairness in professional environments, partner selection and position in the group.

For instance research relating to burn out relates to health issues as well as social institutions (work) in which there is insufficient time and space to learn and develop new techniques; research relating to clinical gerontology is concerned with health as well as life long, implicit, learning; research relating to life long learning and (coping with) stress at the work place is connected with health themes as well as implicit learning in an institutional context and fairness; and research concerning sexual selection involves clinical as well as cultural and biological aspects. At a more abstract level the issues concerning learning and consensual coordination of behaviour in its different forms have a (partial) continuation in institutions: institutions can be seen as the social coagulation (or fixation) of heuristics and other behavioural regulations, consensus, arrangements, etc. (Verheggen, 2005). However, they also offer one of the platforms on which human beings play their power games, present their selves, develop an identity, become ill, work together or against each other, perceive (un)fairness, etc. As can be seen in some of the planned research projects maladjustment to institutional arrangements can have consequences for health. On the other hand there may be interesting mechanisms for dealing with stress in the work place in learning – life long (Ph.D. project JVR). It is the aim of the more theoretical activities in the programme to shed some light on this via the theoretical framework.
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