



**Discovering Jan Smedslund's Psychologic:
Challenging the Assumptions of Psychology**

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Preface

This paper is the result of a longstanding fascination with theoretical issues in psychology. Through this interest, I came across the ideas of Jan Smedslund and his system of psychologic. I was intrigued by the sparse usage of this system as a base for empirical reserach, and found this worthy of further investigation. The idea for this paper is largely of my own making. My supervisor has suggested the analyses of two randomly chosen articles. The analyses were carried out by me.

This dive into the world of psychologic has time and time again been challenging to the verge of frustration, and beyond. My reward has been a broadened understanding of both theoretical and empirical issues within psychology, for which I am grateful.

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Abstract

The current paper starts with a presentation of the metatheoretical landscape of current psychology. Jan Smedslund's *psychologic* is presented as a post-modern, or constructionalist, approach to psychology as a science. The key elements of psychologic are presented and explained. The system is then applied to two randomly chosen psychological articles: 1) a study of the predictive value of phonemic awareness in kindergarten children for later reading success; 2) an investigation of how autonomous motives influence physical activity intentions within the Theory of Planned Behaviour. Both of these articles were found to benefit from the application of psychologic. Further, the critics of Smedslund are surveyed, and those that pertain to this paper's analyses are examined in detail. It is concluded that the system of psychologic provides conceptual clarity and logical structure. The price for this conceptual clarity is the loss of flexibility that accompanies the rigid definitions in psychologic. It is argued that the application of psychologic can serve as a useful tool for explicating hypotheses and uncovering necessary relationships in empirical studies, but that it does not constitute a substitute for empirical research.

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"Is psychology properly viewed as being 100% empirical? ... If there really are no limits to what we might discover in the course of doing "scientific psychology", then there would also be no limits to how we might properly describe what we discovered and no limits to the concepts we might use in explaining or understanding what we discovered. But this would hold true if we set out to do 100% empirical physics or 100% empirical economics ... or 100% empirical *anything*. So then, why in the world would we call it *psychology*?" (Shotter, 1991, p. 352)

The quote from Shotter points out that in psychology, as in all science, empirical investigations spring from presuppositions that are taken for granted, and help us understand what we are studying. Jan Smedslund (1997) has tried to explicitly state what we must take for granted when dealing with psychological phenomena. The resulting axioms are formulated in his *psychologic* (Smedslund, 1997). Armed with his psychologic, Smedslund claims to show that a lot of prominent empirical psychological research merely demonstrates what we must take to be necessarily true, given the way we talk about psychological phenomena (Smedslund, 1978; 1984; 1990; 1991a; 1999a; 2002).

In this paper, Smedslund's alternative method of inquiry, psychologic (Smedslund, 1997), will be outlined and scrutinized. After an introduction to the metatheoretical landscape the theory grew out of, a summary of the theory will be presented. Two randomly selected articles will then be analysed using psychologic, in order to separate conceptually necessary hypotheses, from empirical hypotheses. Finally, the possibilities and limitations inherent in psychologic are discussed in light of the criticisms the theory has attracted.

Tracing the Common Ground in Psychology

There are many areas of investigation that fall under the "psychology" umbrella, from exploring at interrelationships between people to examining the interrelationships between neurotransmitters. Despite this diversity, there are some prototypical psychological undertakings. One of the defining features of psychology since it began its professional history in the laboratories of Wilhelm Wundt (Alexander, 2003; Hergenhahn, 1997) has been the application of a methodological perspective borrowed from the natural sciences.

The goals of the scientific discipline of psychology can be found explicitly defined in introductory textbooks in methodology: to describe, predict, determine the causes of, and understand human behaviour (Cozby, 1993; Shotter, 1991). These goals implicitly embrace

several meta-theoretical preconceptions regarding humans as subjects of study. Objectivity (i.e. the world as objectively given, independent of the perceptions and interpretations of individuals) and universality (i.e. cross-context and cross-time validity of observed cause-effect relationships) are two of the key assumptions of science. These epistemological beliefs go hand in hand with an empirical approach to explaining human behaviour. Given that our observations are accurate reflections of the world around us, it makes sense to observe behaviour in conditions that minimize possible errors in interpretation in order to uncover universal cause-effect relationships. The prototypical manifestation of this type of investigation is the experiment. The experimental way of collecting data, with its focus on non-participation and objectivity, has from the beginning separated the academic discipline of psychology from everyday psychology, as well as from its philosophical predecessors. This method of investigation has remained characteristic for the field to date (Danziger, 1990).

In an ideal experiment, all observed dissimilarity can be attributed to the manipulation of the variable in question. However, these ideal conditions are rare, even in the physical sciences, and under obtainable conditions there are usually several sources of variance. Of specific importance to psychology is the between-subject variation that is inherent in nearly all human responses. In psychology, statistical analysis represents a coherent logic for making decisions regarding the numerical characteristics of a population when one is in possession of a sample of scores. For example, in the analysis of variance test (ANOVA), the between group variance is divided by the within group variance. This is done in order to see whether groups of subjects are more different from one another than subjects within one group. If groups are found to be *significantly* different from one-another, one concludes that some of the variance can be attributed to the samples being drawn from different populations. Statistical analysis in psychology can be complicated, and some researchers (e.g. Danziger, 1990; Gigerenzer, 1998) have voiced the concern that the pronounced focus on *methodology* has gone too far, and that questions of methodological stringency has come at the expense of other worthwhile investigations. One such concern is the extensive focus on *quantity* in psychological research at the expense of the *quality* of the psychological phenomena under investigation. According to Danziger; "Concern with questions of methodological orthodoxy often takes the place of concern about theoretical orthodoxy when research or its results are discussed and evaluated." (1990, p. 5).

"Modern" Empiricism versus "Post-modern" Constructionalism

The assumptions underlying an experimental approach to gathering information can be categorized as belonging to a *modern* epistemological perspective. During the last half of the twentieth century, a growing body of critics has voiced the opinion that science in general, and psychology in particular, may be labouring under false premises in that the modern perspective, despite its claims to the contrary, does not yield accurate, neutral descriptions of the world. Kuhn (1970) was one of the first to describe some of the social pressures that apply to the "objective" world of science. In his book "The Structure of Scientific Revolutions" Kuhn (1970) describes how a scientific community itself plays a central role in shaping the way phenomena are understood. According to Kuhn, to learn to participate in a scientific community is to study the past scientific achievements that are considered the foundation for further practice. In doing this, students are introduced to, and learn to do research within, the current scientific *paradigm*. Paradigms proscribe to a certain way of understanding different phenomenon. Shared commitment to one paradigm ensures that its practitioners engage in the observations that this paradigm can do most to explain (Kuhn, 1970).

Later writers have focused more directly on the way in which our pre-understandings of what we observe are constitutive of the phenomena we end up describing (Gergen & Davis, 1985). This *post-modern* epistemological perspective challenges the foundations of modernity, asserting that the world is as much in the eye of the beholder as it is "out there"; that science, rather than being a rational, objective way of gathering knowledge, is a social endeavour. What one "discovers" has to adhere to the rules of the specific scientific community one belongs to with regard to the investigatory practices utilized, and the nomenclature employed to describe the observation (Gergen, 2001). In addition, the object of study must be consensually evaluated as worthy of attention. Psychologists embracing this post-modern epistemological perspective refer to themselves as *constructionalists*, emphasising the constitutional role of pre-understanding in constructing whatever phenomenon one deals with (Gergen, 1985).

The Constitutional Role of Language

The role of language is central to the constructionalist perspective and its assail on the epistemology of modernism. Within science (including psychology), language is often used unreflectively (Smedslund, 1997). This means that while phenomena are communicated and understood in terms of language, language itself is not in focus (Smedslund, 1997). The social constructionalist perspective proposes a radical change in the way the role of language is

understood (Gergen, 2001). According to this perspective, language is the primary means by which we learn to navigate the social world. In acquiring language, the individual takes part in a social activity and a cultural practice that transcends the individual's limited history. By learning how to articulate and describe different phenomena within a culture one is simultaneously introduced to the "shared reality" of that culture. To be able to meaningfully express oneself means to take part in the shared intelligibility of a culture, including the nomenclature associated with different phenomena, as well as adhering to beliefs regarding their interrelationships. In this sense, the words of a language are not merely "labels" attached to real world phenomena; they play a central role in *determining* how we come to interpret and understand what we see (Gergen, 2001).

From the constructionist perspective, an analysis of our shared conceptual framework (i.e. language) must precede any attempt at description of human behaviour. If our concepts play a constitutive role in shaping how we see and understand the world, then an analysis of these concepts could inform us of phenomena just as much as observation could. According to Smedslund (1991; 1997; 1999; 2002) this insight is generally overlooked by psychologists, and much research is therefore misguided.

Lack of Conceptual Definitions as the Source of "Pseudoempiricism"

Smedslund, along with other researchers, has questioned whether a substantial amount of empirical psychological research is, in fact, investigations that only *appear* to contribute to psychological knowledge but in reality are of a tautological nature, not contributing with anything that could not be known without the research (Smedslund, 2002; Wallach & Wallach, 1998). Rigidly constructed experiments and precise statistical analysis can be a wasted effort when the concepts under investigation are muddled with inaccuracy, circularity, or when the "independent" and "dependent" variables are, in fact, interdependent by virtue of their conceptual associations (Smedslund, 2002).

Shotter (1991) argues that psychological research has an abundance of examples in which an insufficiently defined concept inspires research leading to confusion rather than clarification, resulting in appeals for more rigorous theoretical analysis to bring order in the chaos. Smedslund agrees, and states that due to lack of conceptual analysis, psychologists often conduct experiments in which they *assume* that the outcome must be empirically established when, in fact, the hypothesis in question must be regarded as true, independently of empirical demonstrations. Smedslund argues that if the concepts under study are interdependent, the appropriateness of the hypothesis is given beforehand, or *a priori*.

To illustrate this point, Smedslund (2002) invites us to take part in a hypothetical experiment investigating whether people who are surprised have just experienced something unexpected. According to Smedslund, *surprise* may well be defined as "the state of a person who has just experienced something unexpected" (Smedslund, 2002, p. 52). This conceptual relation means that the hypothesis under investigation is true by virtue of logical necessity given that the words mean what they mean. If our experiment fails to find this relation then one of the auxiliary hypotheses connected to our procedure (e.g. that the instrument used will be appropriate to detect and measure expectancy and surprise) has been disproved, but not the main hypothesis (that surprised people have just experienced something unexpected).

Thus, experiments constructed to test necessarily true propositions really only test the accuracy of the methods involved. The main hypothesis in this type of experiment is true by virtue of conceptual necessity, and cannot be strengthened or weakened by empirical investigations.

Smedslund (1984; 2002) goes on to argue that in order for there to exist an empirical relation between variables that is not given beforehand, these variables need to be conceptually unrelated. If this is so, then any possible combination of outcomes is both possible and plausible. This, in turn, makes real *hypothesis testing* possible, where both the main-, and auxiliary hypothesis are tested. Smedslund argues that there are very few areas of investigation in psychology that warrant empirical investigation. Further, the true empirical propositions that can be found within psychology have little but local validity (Smedslund, 1984).

The reasons for this are that all psychological phenomena are historical and that historical processes always contain a random component and, hence, are irreversible. Individuals are to a substantial amount a product of their histories. The histories of individuals are punctuated with arbitrary events, and as a result of this, each individual becomes unique and hence incomprehensible and unexplainable except by reference to a series of unique historical events. If one aims to create theories of human action, there has to be some regularity upon which one can build a theory (Backe-Hansen & Schanke, 2004). Smedslund contends that one such source of regularity can be found within language (Smedslund, 1991a; 1997; 1999a; 2002).

Smedslund's Psychologic

The feature of language that Smedslund (1997) directs attention to is its inherent structure. Although any statement can be uttered, there are clear limitations to what can be

meaningfully said, given that the words mean what native speakers of a language take them to mean. If spoken by a fellow human being, the sentence "I am not a person" is hard to comprehend. If the speaker is not a person, then who is the "I" that he/she is referring to? At the very least, this statement informs the listener that some vital context that might render the proclamation understandable is missing.

Common Knowledge as the Starting Point for Conceptual Analysis

Common knowledge was disregarded as a source of knowledge in the early stages in the professional history of psychology. A probable reason for this was that psychology needed to establish itself as an autonomous project, independent from its philosophical predecessors. Fritz Heider (1958) was one of the first psychologists to see that whereas the relationship between common knowledge and science is generally viewed as one where the latter is superior in its command of the truth, this relationship may be more balanced within the field of psychology. In Heider's own words:

"Psychology holds a unique position among the sciences. "Intuitive" knowledge may be remarkably penetrating and can go a long way toward the understanding of human behavior [*sic*], whereas in the physical sciences such common-sense knowledge is relatively primitive. If we erased all knowledge of scientific physics from our world, not only would we not have cars and television sets and atom bombs, we might even find that the ordinary person was unable to cope with the fundamental mechanical problems of pulleys and levers. On the other hand, if we removed all knowledge of scientific psychology from our world, problems in interpersonal relations might easily be coped with and solved much as before." (Heider, 1957, p. 2)

In keeping with Heider's respect for common knowledge, Smedslund (1991; 1997; 1999; 2002) argues that psychology must look to the intuitive knowledge embedded in our use of language. As mentioned, within language there are limits as to what can be meaningfully said. There must be some system in language that makes it apparent when statements do- and when they do not- cohere. Another way of stating the previous is that language consists of concepts that are interrelated, and can be combined in meaningful ways. Every statement implies some other statements, and negates yet others. For example, being a person implies having a physical body; being a student implies that one attends some form of study, and so forth. Competent users of a language presumably agree about these implications. This shared intelligibility of implications is what Smedslund refers to as *common sense* (Smedslund, 1984; 1999). Negations of these common sense principles are contradictory or senseless given that the words mean what they mean. It is important to emphasise that this differs from another popular definition, where common sense is viewed as

predictions and explanations provided by lay people, and, hence can be subject to empirical investigation. According to this latter definition, scientific language is an improvement over the vernacular.

Part of the common sense of a language (i.e. shared intelligibility of implications) refers to psychological phenomena. This sets the conditions for what can be meaningfully said about psychology. Smedslund's psychologic (1997) represents an attempt to explicitly state the structure of this psychological common sense that constitutes the social reality in which people live.

Smedslund (1991; 1997; 2002) argues that language, in order to function to coordinate social activity, has to be understood in the same way by a large number of people. Words are not only defined by their context, but many (if not all) words have a core meaning that will be understood by native speakers of the language (Smedslund, 1991; 1997; 2002). Even if a word is removed from the context of other words and presented to a person, it will not be devoid of meaning. The word "*surprise*" will inspire similar definitions for native speakers; it has to do with the experience of something that was not expected. According to Smedslund, language thus represents a common ground from which one can make valid generalizations about native speakers of a language.

Logic - fundamental to understanding

In outlining the underlying structure of common sense, it became clear to Smedslund that to a significant extent, the inherent structure in common sense is describable using terminology borrowed from logic. The reason for this is that logic is one attempt at explication and formalization of the limits of what can be meaningfully and coherently uttered. As we shall see, Smedslund argues that all understanding *presupposes* logic (1990). In elaborating this argument, one must start by answering the following questions: What does it mean to understand something? How can one explicate understanding? Smedslund (1991b) explains that these very questions were the ones that inspired the formulation of what was to become one of the first axioms (see below) of psychologic.

In an interpersonal context one can say that: "[*person*] *P* understands what [*another person*] *O* means by saying or doing [*something*] *A*, if, and only if, *P* and *O* agree as to what, for *O*, is equivalent to *A*, implied by *A*, contradicted by *A*, and irrelevant to *A* (Smedslund, 1997, brackets added). It should be emphasised that this statement applies to understanding of what someone *means*. There are two important implications of this. The first one is that understanding, the way it is formulated here, is a matter of degree, and can never be complete.

The second one is that through this statement, one can comprehend what Smedslund (1990) refers to as the circular relationship between understanding and logic. An elaboration of this argument follows.

When inspecting whether a person has understood something correctly, the only way to check his/her understanding is by inferring this from their judgements of equivalence, implication, negation and irrelevance. In this inference, one must assume that the individual has used proper logic when reaching his/her conclusion. On the other hand, one can only decide whether a person has used logic correctly by tracing the premises to the conclusion, thus taking understanding of the premises for granted (for an extensive elaboration of this argument, see Smedslund, 1990).

According to Smedslund (1990), this interrelationship entails that the properly illogical can never be explained, nor understood. "Explaining involves describing premises from which a given something follows, and understanding involves describing what follows from a given something" (Smedslund, 1990 p. 116). Since the properly illogical does not follow from any premises, explanation and understanding are impossible. Smedslund argues that what we call fallacies (i.e. errors in reasoning), are subjective misunderstandings of the premises that merely *appear* to be logical errors when one compares the subjective performance to some objective standard. Smedslund argues that when one investigates the subjective premises (i.e. the premises as the individual has understood them) further, in order to ascertain *why* the individual did not comply with expectations of optimal performance, it invariably turns out the premises are misunderstood.

Smedslund (1990) argues that if the aim of psychology is to understand and explain human behaviour we have no option but to presuppose that all voluntary action follows logically from the premises of the individual, and thus, to understand why a person acts the way he or she does, we need to understand these individual premises.

The Structure of Psychologic

Even if one agrees that closer inspection of our psychological concepts is a necessary step toward understanding human behaviour, this endeavour is not without its problems. An analysis of language needs to be communicated by language to reach others. Thus, this analysis would be embedded in, and limited by, the very concepts it attempts to explicate. This could be seen as analogous to trying to inflate a balloon from the inside: without some external input, endless circularity seems unavoidable. Psychologic has introduced primitive terms in order to stop this circularity.

Psychologic in its current form consists of 22 primitive terms, 43 definitions and 55 axioms. It is proposed as an axiomatic system that consists of basic principles which are assumed to be true. The tenets of psychologic are claimed to be *consensually self evident*. This entails that they express truths that necessarily follow from the shared meanings of the terms involved. It is proposed that all native speakers of the language regard these tenets as self-evidently true, and their negations as senseless.

Primitive terms are terms that are not further defined, but are considered basic and self-evident in that they cannot be meaningfully or better defined using other terms. Primitive terms establish a core in the psychologic system that the theory can develop from. Smedslund (1997) argues that, ultimately, all logical systems need a core that cannot be further reduced. Without this core, any attempt to define something would lead to reduction "ad absurdum", or circular definitions (Smedslund, 1997; Wierzbicka, 1992). The selection of primitive terms in psychologic has in part been based on Wierzbicka's work on a natural semantic metalanguage (Smedslund, 1997).

To get a feel for the structure of this system, I will give a short presentation of a primitive term, a definition, and an axiom. A mere listing of the terms of psychologic does not do justice to the thoroughness with which terms are treated in the system. As such, I have chosen to give the examples in their entirety. One of the first primitive terms introduced in psychologic is *act* (do) (Smedslund, 1997, p. 4). Along with the introduction of this term, Smedslund notes:

"In encountering a person we take it for granted that the person acts, does things, or expresses him or herself, *in order to* reach goals, looks and listens *in order to* determine what is going on, and so on. The person is continuously sensitive to the outcome of these activities, which means adjusting subsequent activities in the light of what resulted from earlier ones. This characteristic of acting is labelled *intentionality*." (Smedslund, 1997, pp. 4-5)

Definitions in psychologic are limited to introducing *technical/scientific* terms that the reader may not be familiar with. Definition 1.2.3 states that *intentional = directed by a preference for achieving a goal* (Smedslund, 1997).

Axioms are postulates that are taken for granted by any native speaker of the language. As in any axiomatic system, the axioms in psychologic are assumed to be independent, that is they cannot be derived from one another, and consistent, that is they do not lead to contradiction. There has been a move away from *definitions* to axioms in the development of psychologic (Smedslund, 1997). The reason for this is that to try to capture the meaning of a word in a classical definition is to specify the entire meaning of the word across contexts.

When it comes to words from ordinary language, they have a richness that cannot be captured in terms of a classical definition. Axioms do a better job of freezing the content of a concept only in relation to other concepts, not per se. Axiom 1.2.4 states that *acting is intentional* (Smedslund, 1997).

In addition to the above, psychologic contains *corollaries* that are deduced from propositions involving primitive terms, axioms and definitions. From the preceding we get corollary 1.2.5: *Acting is directed by a preference for achieving a goal*, and corollary 1.2.6: *If [a person] P does something not directed by a preference for achieving a goal, then what P does is not acting* (Smedslund, 1997).

Along with the above corollaries, Smedslund (1997) notes that this use of "intentionality" differs from usage in normal language. In normal language something is said to be done intentionally if it is preceded by an intention or decision to act. In psychologic, intentional activity refers to all activity that involves preference for achieving a goal, and hence, all activity that is sensitive to outcomes. Thus we get the somewhat counterintuitive result that coughing is seen as an act if it ceases when reproached, but not an act if it continues unaffected by this outcome. If a person's hand is shaking and this is not affected by outcome (e.g. spilling coffee), then the shaking is not an act and must be attributed to something outside the persons control or awareness (such as Parkinson's disease).

An Application of Psychologic

Although Smedslund has shown his theory to be applicable to several empirically established psychological phenomena (Smedslund, 1978a; 1984; 1991a; 1999a; 2002), I wanted to evaluate for myself whether the hypothesis generated by mainstream psychologists of today are merely "pseudoempirical" investigations into necessarily true propositions. The following demonstration cannot prove or disprove the tenets of psychologic, but it may serve as a potent demonstration of the usefulness of psychologic.

Selection

For this demonstration, two articles were randomly chosen from the PsycInfo. Eligible articles had to conform to the following criteria: a) published in or after the year 2000; b) be concerned with a psychological issue; c) obtainable in Norway (i.e. with BIBSYS reference); and d) written in Norwegian or English. Articles were chosen by searching the PsycInfo database (through WebSPIRS 5.0) for accession numbers drawn from a random number table (Cozby, 1993, p. 283). The search was entered as "200*-xxxxx-00x" where "*" is a wildcard,

and "x's" are digits from the random number table. For example, from the random number 13 74 67 00 78, the six first digits were entered into the formula as: "200*-13746-007". In this case an article was hit (Mason et al., 2004), but it was discarded as it was from the *British Medical Journal*, and as such failed to satisfy criterion b. A second article was discarded for failing to satisfy criterion d because it was written in German.

Study 1

Random number 09 37 67 07 15, hit the article by Wilde, Goerss, and Wesler (2003), entitled "Are all phonemic awareness tests created equally? A comparison of the Yopp-Singer and the task of auditory analysis skills (TAAS)". This study is a comparison between two tests of phonemic awareness, and their ability to predict later reading success (Wilde et al., 2003). Phonemic awareness is defined as "one's sensitivity to, or explicit knowledge of, the phonological structure of words in one's language. In short, it involves the ability to think about, or manipulate the individual sounds in words" (Wilde et al., 2003, p. 295). Phonemic awareness has been shown to be a strong predictor of reading success, and it has been proposed that children should be screened for phonemic awareness in order to identify children who might benefit from extra interventions when learning to read. The two tests of phonemic awareness (Test of Auditory Analysis Skills-TAAS, and Yopp-Singer Test of Phoneme Segmentation) were administered to 25 second-semester kindergarten children. The dependant variable was the STAR-reading test, a computer-based reading test that provides reading scores for students in Grades 1-12. The STAR was administered to the children in February of their First-Grade year.

The Yopp-Singer test asks children to listen while the experimenter pronounces a word. The child is then asked to reproduce each sound sequentially. So, if the word is "dog", the correct reply would be /d/ /o/ /g/. When scoring, no partial credit is given so the child's score is determined by how many words were correctly segmented.

The TAAS asks children to repeat a word (e.g. "cowboy"), and then to repeat the word but to omit one of the syllables (e.g. "cow" or "boy"). Alternatively, the target word is one syllable (e.g. "meat"), and the child must omit a phoneme from the word (e.g. if asked to omit /m/ a correct reply would be "eat", or if asked to omit /t/ a correct reply would be "me").

The study found that the Yopp-Singer test did not correlate significantly with the STAR-reading test. The TAAS was positively correlated with STAR ($r=.51$). The children's results on the Yopp-Singer and the TAAS were also positively correlated ($r=.56$)

Study 1, analysed using psychologic

Psychologic is a system of inter- and intrapersonal common sense. As such the processes of learning to read and write are not specifically dealt with. The following analysis will therefore be based on applying the principle of the a priori, rather than draw on applying actual psychologic propositions. This means that the study will be analysed to see whether the hypothesis in question is, in fact, an empirical hypothesis. To qualify as empirical the concepts involved in the hypothesis cannot be related by definition or conceptual relation (Smedslund, 1984; 1991a; 1999a; 2002).

The scope of the study by Wilde et al. (2003) was to see whether the Yopp-Singer and the TAAS both predict reading success equally well. The hypothesis that phoneme analysis will predict reading is (with reference to empirical studies) taken as a given. However, the fact that phoneme analysis is correlated with reading can also be known a priori, as will be argued below.

The process of phoneme analysis, defined as the ability to identify the phonemes of a word, is an integral part of writing. This is a necessity given the way our written language is based on the auditory properties of spoken language. This is not the case for logographic systems of writing, or in older pictographic writing, and this argument does not apply to these languages (Fisher, 2001). One can also take as a given that phoneme synthesis, defined as the ability to identify separate sounds as a word (e.g. "combine the sounds /d/ /o/ /g/ into one word"), will be correlated with reading success. This is referred to as *phonics* by Wilde et al. (2003). However, since the synthetic and the analytic processes are interwoven (one can hardly imagine knowing one without knowing the other), one can assume that any instrument measuring either one will be correlated with reading success. If a person is not able to separate the phonemes of a word, the person will be unable to learn to read and write our written language by reference to its depiction of sounds. It should be mentioned that the preceding argument does not apply to learning to read through word recognition.

The idea that phoneme analysis/synthesis is *predictive* of reading success presupposes that phoneme analysis is learned prior to reading and writing. To some extent, this is necessarily true as one cannot understand the principle of our written language without first, or at least simultaneously, being introduced to the concept of words consisting of many separate sounds. However, there seems to me to be no way to state a priori whether this ability exists independent of learning to read and write. Thus, this matter of deciding whether or not phonemic analysis is learned prior to writing, and hence can be used to predict writing success, represents a true empirical hypothesis.

The study by Wilde et al. unfortunately does not offer an answer to the predictive qualities of phonemic awareness, as children were not tested for reading skills simultaneously with tests of phonemic awareness. The test of reading skills (STAR) was administered separately long after the TAAS and the Yopp-singer. On account of this, when looking at this study in isolation, the study cannot speak to the issue of prediction.

Phonemic awareness, as measured by the TAAS, was correlated with later reading success. Phonemic awareness, as measured by the Yopp-Singer was not correlated with later reading success. Although the present correlation cannot speak to the predictive value of the TAAS, this relationship needs further empirical investigation. As for the Yopp-Singer, the present study eliminates it as a possible tool for early prediction of reading success.

In summary; the application of psychologic to the study by Wilde et al. (2003) shows that the question of whether phonemic awareness predicts reading success is conceptually sound. It has been argued that phonemic awareness is an integral part of learning to read, given the way our written language is constructed, the issue of whether this skill is established prior to learning to read must be established empirically. Further, the validation of specific procedures and instruments will always be an empirical endeavour that cannot be anticipated by conceptual analysis. However, one can argue that such validation would profit from a design where the main hypothesis is given a priori so that the result can be unambiguously attributed to the appropriateness of the auxiliary hypothesis (Howard, 1991; Smedslund, 2002).

Study 2

Random number 15 95 33 47 64, hit the article by Hagger, Chatzisarantis, and Biddle (2002), entitled "The influence of autonomous and controlling motives on physical activity intentions within the Theory of Planned Behaviour". This study investigated how general goals (i.e. autonomous and controlling motives) influence physical activity intentions within the framework of the Theory of Planned Behaviour (Hagger et al., 2002).

The Theory of Planned Behaviour (TPB) is a model of human reasoning that has been applied to questions of health related behaviour. The model presupposes that humans are rational decision makers and that our *intention* to engage in any behaviour is based on considerations of our *attitudes* toward the behaviour in question, our *subjective norms*, and our *perceived behavioural control* (PBC). Hagger et al. (2002, p. 284) explain that in TPB "intention is viewed as the most proximal predictor of behaviour ... and is hypothesized to mediate completely the influence of the cognitions of attitude, subjective norms and PBC on

behaviour". Attitudes in TPB are aggregates consisting of the belief that the behaviour in question will produce a given outcome, and the value placed on this outcome. Subjective norms consist of the individual's beliefs regarding whether or not other people want him/her to perform a given behaviour, and the individual's motivation to comply with these referents. Finally, PBC refers to the individual's belief that he or she is capable of performing the behaviour in question. The Theory of Planned Behaviour is summarized in Figure 1.

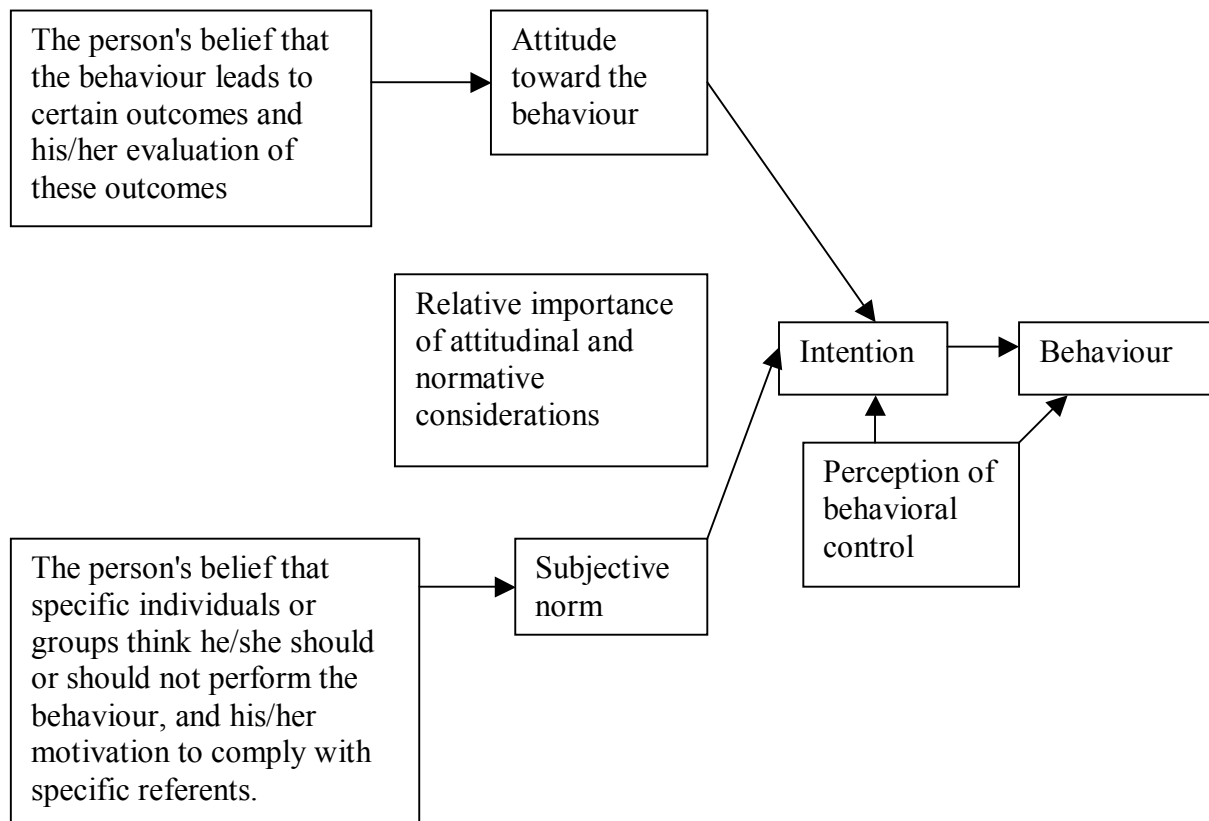


Figure 1. The Theory of Planned Behaviour. Adapted from G. Smedslund (2000a, p. 136)

Hagger et al. (2002) argue that there is a weakness in TPB in that it does not account for the influence of superordinate, cognitive influences on behaviour. Although the TPB helps to identify what cognitive factors underlie intentions to act, it may be limited in that it is context-specific. Hagger et al. suggest that the TPB would be improved by adding the influence of more general motives on the cognitive factors of the TPB. They argue that constructs from self-determination theory can be adopted to demonstrate that "individuals can base their intentions ... on the higher, more general motives generated by their *psychological need* for self-determination" (p. 285).

Hagger et al. (2002) suggest the addition of the perceived locus of causality (PLOC) continuum to the TPB. The PLOC is designed to measure an individual's autonomous motives, and consists of four scales arranged in order from high autonomy (autonomous motives) to low autonomy (controlling motives). *Intrinsic motivation* is said to be present when "individuals engage in the behaviour spontaneously for enjoyment, pleasure and fun with no discernible reinforcement" (Hagger et al., p. 286). *Identification* is described as "participation in the behaviour due to personally held values such as learning new skills, resulting in feelings of pride and satisfaction" (Hagger et al., p. 286). *Introjection* is said to be the underlying motivation when "individuals engage with the behaviour when felt under pressure by *perceived* external sources, resulting in feelings of guilt and shame" (Hagger et al., p. 286). Behaviour motivated by *external regulation* is "characterized by the feeling that one is forced to perform the behaviour due to external reinforcement such as gaining rewards or avoiding punishment" (Hagger et al., p. 286).

The hypothesis for the study was that the autonomous motives of the PLOC (i.e. intrinsic motivation and identification) would predict attitudes and PBC in the TPB, and that these cognitions would mediate the influence of autonomous motives on behaviour. Also, the controlling motives of the PLOC (i.e. introjection and external regulation) were hypothesised to predict subjective norms, and to exert a negative influence on attitudes and behaviour.

Hagger et al. (2002) distributed the TPB questionnaire and the PLOC inventory to 1088 children. In the TPB questionnaire, children were asked questions pertaining to their intentions-, attitudes-, subjective norms, and perceived behavioural control over strenuous physical activity. The PLOC inventory had questions regarding the children's rationale for engaging in physical activity (e.g. "to have fun" or "because others want me to"). Through structural equation modelling, the authors found that the autonomous motives of the PLOC were correlated with the TPB concepts of attitude ($r=.74$), subjective norm ($r=.37$), and PCB ($r=.71$). The effects of controlling motives on TPB concepts were non-significant. The TPB concepts of attitude and PCB were correlated with intention ($r=.41$ and $r=.45$ respectively), but subjective norms did not correlate with intention. The authors conclude that general autonomous motives act as sources of information when children make their judgments regarding their intention to engage in physical activity.

Study 2, analysed using psychologic

Unlike the study by Wilde et al. (2003), Hagger et al. (2002) have several propositions in their study that directly coincide with psychologic. They also draw on the TPB in their

evaluation of PLOC, and these instruments will be analysed separately. For this reason, the present analysis will be more elaborate than the previous one.

When analysing the study by Hagger et al. (2002) in light of psychologic, it is of prime importance to explicate the concepts inherent in the study. The attainment of conceptual clarity is the main motivator underlying the project of psychologic. Compared to the level of specificity within this system, Hagger et al. offer only limited definitions of their concepts.

Analysis of the Theory of Planned Behaviour. Hagger et al. (2002) formulate their hypothesis within the framework of the TPB. The TPB is an attempt at creating a model of the deliberation process that is thought to precede behaviour. In this model, *intention* is used as the cognitive variable most proximal to behaviour. The TPB concepts of intention and behaviour cannot be directly translated into the concepts of psychologic.

Psychologic differentiates between *behaviour* and *acting*. Behaviour as a concept expresses something that is *objective* (intersubjective) and *causational*, whereas acting is *subjective* and *intentional*. A given behaviour can be an expression of different acts. For example, running (behaviour) can be a manifestation of the act of exercise or the act to escape a threatening situation (Smedslund, 1997). Correspondingly, a given act can be expressed through different behaviours. For example, the act of exercise may be manifested by running or weightlifting. Since TPB focuses on the deliberation process preceding behaviour, it seems to conform to the psychologic concept of *acting*. In the following, the TPB concept of *behaviour* will be treated as synonymous with *acting*. To find the psychologic equivalent of the TPB concept of *intention*, a further analysis of the conditions for acting is required.

According to Smedslund (1997), the necessary and sufficient conditions for acting are that a person *can* act and that the person *tries* to act. There are two underlying concepts of *can*. One is the *ability* (primitive term) of the person; the other is the *difficulty* (primitive term) of the task. When it comes to *trying*, a person will try to do the act with the highest momentary expected utility. (Definition 2.4.11: *the expected utility of doing A, for P = the product of the expected outcome value of A, for P, and the expected likelihood, for P, of A leading to that outcome*). The constituent factors of expected utility are the subjective evaluation of the *exertion* (primitive term) involved; the subjective *value* (definition 2.4.4: *the value of X for P = the degree to which X feels good versus bad to P*) of the goal; and the subjective likelihood that trying to do A will lead to the goal. The subjective likelihood that trying will lead to the goal is further composed of the subjective likelihood that the person has

the ability to perform the act; and the subjective likelihood that the act will lead to the goal. A summary of these conditions is presented in Figure 2.

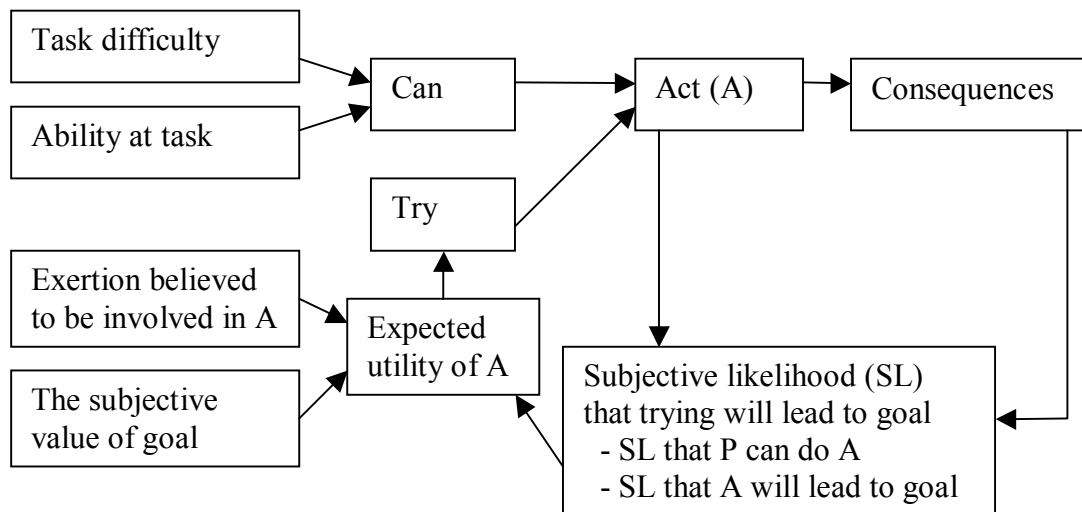


Figure 2. The conditions for acting according to psychologic. Adapted from G. Smedslund (2000a, p. 142)

From the preceding analysis of action, a comparison between the models of psychologic and TPB can commence. There is an obvious difference between the models in that while TPB is a model designed to predict health behaviour, psychologic describes actions in the way they must be described if they are to be comprehensible. Overtly, this means that the TPB can be validated by empirical investigation, whereas psychologic claims that the concepts involved in describing action are necessary and sufficient, and cannot be strengthened or weakened by empirical investigations. For the purposes of this paper, TPB will be compared with psychologic to determine which parts of the model are empirical, and which are conceptually necessary.

Returning to the TPB concept of *intention*, Hagger et al. do not define this concept explicitly, but state that it is the mental concept closest related to behaviour. According to the *Oxford advanced learner's dictionary* (Wehmeier, 2000), intention is defined as "what you intend or plan to do; your aim" (p. 677). This conceptualisation of intention relates that it is the result of a deliberation that the individual is reflectively aware of. This is corroborated by the definition of *intentional*: "done deliberately" (Wehmeier, 2000, p. 677). In psychologic, all *acting* that is sensitive to outcome is regarded as intentional. Thus, if the concept of intention can be rephrased as "intention to try" without violating the tenets of TPB, the equivalence to psychologic becomes apparent. In psychologic *trying to act* is intentional because it is

considered the outcome of a deliberation process. The closest psychologic concept referring to the end product of deliberating whether or not to act is *expected utility*; which leads to trying if the act contemplated is the one with the momentarily highest expected utility. Thus, for the purposes of this paper *intention* will be considered equivalent to *expected utility*.

As for the TPB concept of perception of behavioural control, Hagger et al. (2002) state that this concept is constituted of both the perceived difficulty of the behaviour for the individual, as well as the individual's perception of his/her control of the behaviour. The first part of this definition corresponds to the psychologic concept of subjective likelihood that a person can act (i.e. estimations of ability and difficulty). The outcome of this subjective evaluation will influence intention in the way that if a person does not believe he/she can do the task, they will not try. This follows from corollary 2.4.32 *If P does not believe that P can do A, then P does not try to do A* (Smedslund, 1997, p. 28). Thus, there is a conceptually necessary relationship between the concepts of PCB and intention. The relationship is such that belief in ability is necessary for intention.

The second part of the definition of PBC in TPB involves the individual's evaluation of whether the initiation or abstention of the behaviour is under the individual's *control*. In the psychologic presentation of the conditions for acting, control is not explicitly mentioned, but is implied through the very concept of *acting*, which is always considered intentional and sensitive to outcome.

The definition of control in psychologic is *P controls [event] E = P can make E occur or not occur according to P's wants* (Smedslund, 1997). It follows from the previous conceptualisation of control that the amount of control a person possesses over a specific behaviour will exert an influence over intention to perform the behaviour in question only to the extent that the person perceives that he/she has control. If the person perceives no control over the behaviour, then the person does not choose to do or to refrain from the behaviour based on his/her evaluation of the outcome, but because the individual believes that he/she is powerless to behave otherwise. Thus, subjective belief in control is necessary for intention to act.

The preceding analyses of the PCB concept demonstrate that both belief in ability and belief in control are necessary conditions for intention. From this there is a conceptually necessary relationship between the concepts of perceived behavioural control and intention as used in the TPB. The relationship between PCB and intention is similar to the relationship between the *subjective likelihood that trying will lead to goal* and *expected utility*.

Confirming to expectations, Hagger et al. (2002) report a positive correlation between PCB and intention ($r=.74$). The fact that Hagger et al. found this conceptually necessary relation lends support to the validity of their instruments and procedures.

The assumption that individuals will consider not only what they want to do, but also what other people want them to do, is central to the TPB. This assumption is expressed through the distinction between *attitudes* and *subjective norms*. In the preceding presentation of psychologic, these concepts are collapsed in the *subjective value of goal*. This does not mean that the wants of other people are not considered important in psychologic.

Subjective norms in TPB are constituted by the individual's belief that other people will want him/her to act in a certain way, and his/her motivation to comply with these people. For the purposes of this paper, *motivation* will be equated with the primitive term *want*. The relationship between the wants of the individual and the conditions of trying (described earlier) is that wants describe the underlying preferences that are used to evaluate a given course of action. According to psychologic, the wants and wishes of other people are taken into consideration by the individual to the extent that he/she has wants and beliefs (primitive term) that are frustrated if this is not done. According to Smedslund (1997), there are, in principle, no limits to what a person can want. As such, there are a number of wants that can be fulfilled by complying with the wishes of other people. To produce an exhaustive list of the things that any individual wants is an impossible task, and even to begin would require detailed knowledge of the individual's history. However there are some things that all persons must want, because they are persons (Smedslund, 1997).

According to Smedslund (1997), there will always be interplay between several wants in any interpersonal context. Perhaps the most basic want is described in axiom 3.2.1 *P wants to feel good and wants to avoid feeling bad* (Smedslund, 1997). This want is controlled by the want expressed in axiom 1.3.9 *P wants to do what P believes is right, and wants not to do what P believes is wrong* (Smedslund, 1997). Another want that is of interest to the TPB concept of subjective value is implicit in the definition of *care*: *P cares for O = P wants O to feel good*. Whether or not a person chooses to act according to these wants is dependant on the strength of these wants as compared to other wants.

According to psychologic, the want to act according to what is right and wrong (normative wants), the want to feel good (personal want), and the want to please others, along with all other wants a person has, are integral parts of the evaluation of outcomes. This entails that when a person estimates his/her value of a goal based on one of his/her wants, any perceived negative consequences for other people decrease the subjective value of this goal to

the extent that this outcome compromises the individual's normative wants or other personal wants.

The TPB separates the wants of the person from the wants of significant others in the concepts of attitude and subjective norm. Psychologic challenges the validity of this segregation the way this is done in the TPB. It seems that subjective norm includes wants concerning how to act towards other people and thus constitutes a part of what is considered when one evaluates outcomes (i.e. attitude formation). It follows from this that one cannot have a maximally positive attitude toward a specific behaviour while at the same time having a maximally negative subjective norm for the same behaviour. The consequence of this conceptual overlap is that these concepts will be positively correlated by virtue of logical necessity. The TPB does not predict this conceptually necessary relationship.

It follows from the preceding analysis that it is problematic to regard *subjective norm* as an individual contribution to intention, separate from *attitude*. It should be mentioned that Hagger et al. (2002) found the concepts of attitude and subjective norms to be correlated ($r=.30$). Further, in their structural equation model, subjective norms were not found to exert a distinct effect on intention, which corroborates the idea presented here that subjective norm is an integral part of estimating the value of a given course of action.

Analysis of the perceived locus of causality. The scales of the PLOC have already been described. The PLOC was introduced in the study by Hagger et al. (2002) to see whether it could be a useful tool in investigating the influence of autonomous motives on behaviour. Hagger et al. says that the autonomous motives of individuals are "generated by their *psychological need* for self-determination" (p. 284). Again, the concept of autonomous motive is not further defined, except by reference to the features of the PLOC-scales (see above).

The *Oxford advanced learner's dictionary* states that when used in reference to persons, the word *autonomous* means "the ability to act and make decisions without being controlled by anyone else" (Wehmeier, 2000, p. 70). This definition leaves much of the meaning of the word *autonomy* to what is meant by *control*. Psychologic states that an individual has control over an act if he/she does or does not do the act according to his/her wants, and independently of the wants of other persons (Smedslund, 1997). *Autonomous motives* can, based on this definition, be translated into psychologic as, *a want to regulate one's acts according to one's wants, independently of the wants of other people*.

In psychologic, it is taken as a given that *every person wants to have control in matters involving the fulfilment of wants* (Smedslund, 1997, p. 76). Thus, from the perspective

of psychologic, to study *autonomous motives* would involve investigating the degree to which fulfilment of an individual's own wants are independent from the wants of others. This is not an easy task. Take for example the concept of *care*, in which an individual wants to make another individual feel good; an individual acting according to this want, tries to do something the other individual wants in order to make him/her feel good. It is difficult to determine whether this situation represents high or low control according to the definition above. Clearly the individual is acting according to his/her wants (i.e. high control), but what the individual *does* is dependant on the wants of the other person (i.e. low control).

It seems that the issue of control is pertinent only when the wants of the individual are in conflict with the wants of other people such that the individual cannot act both according to his/her wants and according to the wants of other people. In fact, the concept of autonomy can only make sense when there is a conflict of interest. As such, autonomy can only be assessed in situations where the wants of the individual are not compatible with the wants of other people.

What Hagger et al. (2002) suggest is that when this dilemma occurs, individuals will act according to a stable disposition regarding whether they fulfil their own wants, or the wants of other people. The more an individual tries to fulfil his/her own wants, the higher the degree of autonomy.

The inference that control is a stable disposition has no explicit counterpart in psychologic. However, Smedslund (1997) does suggest that people are disposed to behave in one way or the other. In a note elaborating the way a person's control is inversely related to the control other people have over him/her Smedslund writes: "At the one extreme is the completely independent person who can prevent others from influencing him or her in any way. At the other extreme is the person who cannot avoid following any suggestions and orders from others." (Smedslund, 1997, p. 67).

Hagger et al. (2002) use the PLOC as a measure of autonomous motives. The PLOC asks individuals why they engage in a particular behaviour, and from the answer to this question an inference regarding the influence of autonomous motives is drawn. According to the previous discussion there is a problem with this inference because none of the PLOC scales compare the wants of the individual with the wants of other people. Only if individual and external wants are incompatible and the individual chooses to act according to one of them can an inference regarding autonomy be made. It is perfectly possible for the same person to be motivated for the same behaviour according to all the scales of the PLOC. A person can do his/her job because it is fun (i.e. intrinsic motivation), because it makes the

person proud (i.e. identification), because they would feel guilty if they did not (i.e. internalisation), and because he/she gets paid (i.e. external regulation). As such, the PLOC scale does not demonstrate autonomous motives, but rather shows that different wants can be fulfilled by the same behaviour.

Summary and implications. The main hypothesis in the study by Hagger et al. (2002), was that autonomous motives influence behaviour in a way that would be compatible with the TPB concepts leading to intention.

The application of psychologic to the study by Hagger et al. (2002) has shown that the TPB has considerable conceptual overlap in a way that is not predicted by the TPB model. Using the TPB as a frame of reference is thus problematic. Further, the PLOC has been shown to fail to satisfy the necessary condition that personal wants and the wants of other people must be incompatible to allow inferences about autonomous motives. The PLOC is thus inadequate for measuring autonomous motives. The fact that the PLOC does not measure autonomous motives means that the main hypothesis proposed by Hagger et al., is not answered by their study. This entails that their conclusion is not supported by their study, and that the correlations between the PLOC concepts and TPB concepts could be attributed to other sources.

Discussion

The preceding attempt at application of psychologic to two randomly selected articles has shown that detailed conceptual analysis may help to untangle empirical from conceptually necessary hypotheses. In the study by Wilde et al. (2003) both the predictive value of phonemic awareness for later reading success, and the validation of the specific tests of phonemic awareness were found to be true empirical investigations. It was further argued that to reduce ambiguity of results these hypotheses should not be tested simultaneously. In the study by Hagger et al. (2002), psychologic demonstrated a conceptual overlap in the TPB. Further, the analysis revealed that the PLOC did not allow for inferences about autonomous motives. Thus, the study inappropriate to answer the hypotheses Hagger et al. proposed.

Based on earlier comments to Smedslund (1978a; 1991a; 1999a; G. Smedslund, 2000) I will try to predict some of the critiques that can be directed at the current application of psychologic. The nature of this discussion revolves around two central themes: the "modernist" argument that empirical investigations are given too little room in the theory; and

the "post modernist" argument that the rigid structure of psychologic removes it far from the normal use of language wherein the basis of common knowledge lies.

Are "Pseudoempirical" Investigations Worthless?

Perhaps the most prominent feature of psychologic in the psychological literature is the plethora of critics it has attracted, coupled with the relative scarcity of supporters. It seems that it is difficult to remain neutral when faced with Smedslund's provoking ideas. One reason for this is undoubtedly the fact that Smedslund has gone to great lengths to show how his earlier prize-winning research and the research of fellow psychologists are demonstrations of that which must be taken for granted when studying psychological phenomena (Smedslund, 1978a; 1978b; 1984; 1991a; 1991b; 1999a; 1999b; 2002). Smedslund's persistent referral to empirical investigations into matters that involve conceptually related concepts as "pseudoempirical" undertakings seems to discard the potential value of these experiments.

Although some of the hypotheses in the preceding examples in this paper have been shown to conform to the conceptually necessary, several researchers (Bandura, 1978; Gergen & Gergen, 1999; Ossorio, 1991; Overton, 1991; Shotter, 1991; Shweder, 1991; Teigen, 1999) argue that this does not render the experiments without value.

Howard (1991) argues that the research Smedslund (1991a; 1999a; 2002) labels pseudoempirical, can serve worthwhile scientific purposes. For example, experiments classified as pseudoempirical can be constructed as valuable tests of auxiliary assumptions and instruments. The validity of the instruments used in the experiments are corroborated when investigations into conceptually necessary relationships conforms to expectations. Smedslund (1991b; 2002) agrees with this position, and adds that the validation of an instrument will always be an empirical undertaking, and the best way to establish validity may be to investigate necessary relationships. In the present analysis, it was argued that Wilde et al. (2003) would be well advised to separate their hypotheses of validation and prediction, precisely for this reason.

Further, Howard (1991) argues that the boundaries between the pseudoempirical and the proper empirical are not clear cut, but entail some areas of grey in between them. In the current application of psychologic, the TPB concept of perceived behavioural control was found to share a conceptual relation to the concept of intention such that perception of control is a necessary condition for intention. Apparently, Howard would argue that this partial relation does not preclude an additional empirical relationship. Here, Howard and Smedslund (1991; 2002) disagree. Smedslund argues that "if two variables are conceptually related, then they cannot be regarded as empirically related, and vice versa" (Smedslund, 2002, p. 4). Thus,

for Smedslund, a relationship between concepts cannot be partially conceptual and partially empirical.

Some years before Smedslund coined the term pseudoempirical, Kuhn (1970) addressed the predictability of empirical research: "Though its outcome can be anticipated, often in detail so great that what remains to be known is itself uninteresting, the way to achieve that outcome remains very much in doubt." (Kuhn, 1970, p. 36). Kuhn and Smedslund apparently agree that empirical research often investigates necessary relationships. However, empirical investigations can be undertaken for reasons that do not necessarily entail confirmation or disconfirmation of hypotheses, thus escaping being labelled as pseudoempirical.

Other Rationales for Empirical Research.

Gergen and Gergen (1999) argue that the largest obstacle for current psychological research is not that it investigates conceptually necessary relationships. Gergen and Gergen contend that tautological investigations are welcome as far as they are valuable to the culture at large, that is, as long as it is directed at the culture's needs or values. The insignificance of psychological research from the point of view of contemporary culture is a more serious problem for the empirical branch of psychology. The authors take the example of psychological research trying to establish the reliability of children's eye-witness testimonies in cases of child-abuse. This research is highly culturally relevant, and thus escapes the challenges of pseudoempiricism, even if the research should be found to be of a tautological nature. The application of this critique to the studies reported the current paper will be explored below.

In the case of Wilde et al. (2003) their stated reason for doing the study was a decision made by the administrators of the school district to screen all children for phonemic awareness in order to identify children who might benefit from additional education. However, when screening children for phonetic awareness using the Yopp-Singer Test of Phonemic Segmentation, the teachers reported that it provided little information. The study was done to see if the Yopp-Singer could be substituted with another test of phonetic awareness (TAAS) and whether this latter test could be more successfully administered. Learning to read is considered a high-priority goal, and necessary to participate in higher education. As such, the study of Wilde et al. must be considered to be of high significance, not only to the local community, but also to contemporary culture at large.

Hagger et al. (2002) investigate the role of autonomous motives on intentions to engage in physical exercise. With an ever growing portion of people being classified as obese, investigations that may contribute to get more people to engage in physical activities must be considered important contributions to public welfare. However, the practical applicability of the results presented by Hagger et al. is not obvious. Although it would be rash to dismiss the study as inconsequential to contemporary culture, the authors would do well to outline in more detail the way their study leads to practical recommendations for instigating motivation to engage in physical activities.

Although the suggestion from Gergen and Gergen (1999), that psychological research should consider its impact on contemporary culture is laudable, the problem with this suggestion is that it is not always possible to assess the impact of research in advance.

Bandura (1978) and Teigen (1999) point to another important role for empirical inquiry. Using an investigation into the phenomenon of *surprise* as an example, Teigen shows how empirical research can highlight novel relationships. When investigating the relationship between expectancy and surprise, Teigen found that a person who was given a particular probability of success and succeeded was believed to be more surprised than a person who is given the same probability of failure and fails. Teigen argues that this relationship between expectancy and surprise would go undiscovered by someone who believes that psychologic has closed the case of surprise. This example highlights the way in which "evidence generated by empirical investigations particularize relationships and throw into prominence unrecognized determinants and processes of behaviour" (Bandura, 1978, pp. 97-98).

Supporting both Teigen's and Bandura's argument, an unexpected relationship was also found by Hagger et al. (2002). According to their analyses, the TPB concepts of perceived behavioural and attitude were correlated ($r=.58$). This is unexpected as these concepts, both according to the TPB, and according to the psychologic equivalents, are considered independent. This could represent a failure of the measures used, it could represent a properly empirical relationship, or it could represent a conceptual relationship not accounted for by either model. A thorough discussion of the character of this relationship will be beyond the scope of this paper. Suffice it to say that the comments of Teigen and Bandura accurately identify a valuable contribution of empirical research.

Teigen (1999) stretches this argument further, and proposes, along with Fiske (1991), that empirical research might have a more prominent role in psychologic than Smedslund is aware of. The authors question the degree to which the "logical derivations" of psychologic instead represent systematizations of published research findings. Applied to the discussion at

hand, Teigen (1999) could perhaps argue that if the previously unexpected correlation between PCB and attitude that Hagger et al. (2002) reported, is analysed after one knows the result, one is lead to believe that the outcome could have been known all along. Teigen refers to the phenomenon that people who know the outcome of an event believe that this outcome was foreseeable, as the *hindsight bias* (Teigen, 1999). This bias could contribute to a belief that research results are pre-determined by virtue of conceptual necessity.

Further, Vittersø (2002b) draws attention to the phenomenon that people, including researchers, tend to search for confirmation of their beliefs rather than disconfirmation. Vittersø shows that, at least on one occasion, Smedslund has fallen pray to this *confirmation bias*, and failed to search for examples that would refute a conceptually necessary relationship. Given that the hindsight bias leads to a belief in conceptually necessary relationships, and that the confirmation bias leads to confirmation of this belief, psychologic could, as Teigen (1999) and Fiske (1991) propose, be dependant on empirical research. Taken together, the phenomena of hindsight bias and confirmation bias propose one possible reason why psychologic thus far has been better characterized by *post-diction*, rather than contribute with *prediction* of psychological research (Teigen, 1999). Based on these arguments, Teigen, Fiske, and Vittersø suggest that empirical investigations continue much as before, because today's empirical studies are the basis of tomorrow's common sense.

The current application of psychologic has also utilized examples from already existing research to demonstrate the application of psychologic. As such, there is a possibility that these analyses are influenced by the aforementioned biases. However, the system of psychologic and the studies analysed in this paper exist independently of each other, and as such, the results of the current studies have had no influence on the content of the pre-existing propositions of psychologic.

The role of the two studies in this paper have been to exemplify how psychologic can be applied, and to evaluate the utility of this application. This comes close to Leary's (1991) rationale for empirical investigations. Leary voices the opinion that being able to point to data to demonstrate what you are talking about dramatically raises the status of your argument. Leary argues that this is a fundamental aspect of the psychology of science. Leary's argument explicitly states what is assumed in both the current application of psychologic and in earlier presentations of psychologic (Smedslund, 1978a; 1984; 1990; 1991a; 1999a; 2002), that it is preferable to exemplify an argument by reference to actual examples. In fact, Leary goes so far as to argue that the strict focus on conceptual definitions under ideal circumstances, which constitute the prerequisites of psychologic, are so far removed from the realities of research as

to constitute a form of *pseudorationality*. Leary gets support for this argument by Overton (1991), who adds that it is equally important to avoid collapsing theory into empirical data as it is to avoid the opposite; to collapse theory into deductive formalism or logical data.

Apparently, this argument has also appealed to Smedslund. In 2002 he presented empirical data that supports his claims that psychologic is cross-cultural and that psychologic propositions are regarded as self-evidently true. In these experiments, participants were asked to judge whether implications of psychologic axioms were "most likely true" or "most likely false" and, in the latter case, to provide a counterexample. If participants provided inconsistent answers to reversed items, these were pointed out, and participants were allowed to change any one of conflicting answers. In the end, 97% of answers from native English speakers, 98% of answers from native Norwegian speakers, and 92% of answers from native Urdu speakers were in accord with psychologic. In previous studies participants were deliberately challenged to think of exceptions to axioms of psychologic. Smedslund (2002) explains that in these experiments initial agreement with axioms of psychologic was approximately 60%. A further analysis of counterexamples was conducted to determine whether the examples represented misunderstandings or valid objections to psychologic. After this analysis, agreement to psychologic axioms was estimated to 97%.

It appears from the previous discussion that psychologic is not incompatible with empirical investigations. Empirical investigations can be directly used to estimate the consensus regarding psychologic propositions. Further, results from empirical research inspire theory construction, and new theories inspire empirical investigations. In this way, theory and data give each other life. Data without theory are meaningless, and theory without data remains in desolation.

The Rigidity of Psychologic

While agreeing with Smedslund (1991a; 1999a; 2002) that the achievement of conceptual clarity is central to the future of psychology, Leary (1991) argues that a conceptual analysis must start with the historical context that concepts grew out of. Concepts, according to Leary, are more transparent in earlier stages of their evolution when they were more likely to be seen as metaphorical rather than literal. As an example, Leary takes the concept "person" that is abundant in Smedslund's definitions and axioms, and claims that the very idea of personhood is a Western category, and that it is less than a century old as a specifically psychological term.

The historical influence on the concepts of language is also addressed by Gergen and Gergen (1999). These authors argue that there is a major problem inherent in Smedslund's theory of psychologic. With its focus on structure and strict definitions, psychologic disregards the malleability of language. Gergen and Gergen (1999) argue that Smedslund is self-referentially inconsistent when it comes to this point. When demonstrating the application of this theory, Smedslund invariably "translates" the concepts involved to the language of psychologic. In doing this, Smedslund uses the malleability of language in order to show that his psychologic principles underlie the professional, or common, vernacular. Thus, he makes use of flexibility to argue for rigid structure. The current demonstration of psychologic also falls prey to this critique. The inference that "motivation" is equal to "want" has been made previously. This is done in accordance with the belief that the concept of "want" is fundamental to human language and cannot be better explained by other concepts. The concept of motivation, on the other hand, is not more than a century old (Danziger, 1997), and can be substituted for "want" in the majority of situations. Without this clarification as to what is ultimately meant by the concepts we use, we could end up doing what Smedslund refers to as pseudoempiricism: investigating relations between concepts that have overlapping definitions.

The central theme of this discussion is whether the words of language carry with them a core meaning that can be used as a frame of reference for further deduction. Psychologic takes this as a given. In contrast to this view, Shweder (1991) argues that terms often are not reducible to a semantic definition, but rather signifies an interpretive scheme, referring to all aspects of the term in question. Shweder argues that this is true for emotional terms, and perhaps also for other terms. Vittersø (2002a; 2002b) appears to agree with Shweder on this point. Wierzbicka (1992), on the other hand, argues that the fact that no satisfactory semantic definitions for emotional terms have been made is a testimony to the complexity of creating such definitions, but that to conclude that such definitions cannot be accomplished is premature. Wierzbicka tries to demonstrate the plausibility of such definitions. The controversy in this matter is not one to be easily resolved, and the views entertained on this subject has major implications for how psychologic should be applied (if at all).

There has been considerable debate among Smedslund's critics pertaining to the application of psychologic (if any). In Shweder's (1991) interpretation, Smedslund (1991a) offers three stances as to the scope and application of psychologic. In the strong version the promise of psychologic is to offer universal, eternal truths. The moderate version holds that the axioms are "plausible" to a certain interpretive community. Both these versions hold that

ordinary language terms for mental states are semantically definable. The weak version urges researchers to worry about the epistemic status of their propositions, clarify their concepts, state their axioms, and view psychologic as a hypothetical model of a logically possible world.

There seems to be a broad consensus with regard to the utility of the "weak" version of psychologic. Many authors (including, Davies, 1991; Helstrup, 1999; Leary 1991; Ossorio, 1991; Seedhouse, 2000; Williams, 1991; G. Smedslund, 2000a; 2000b; Rognes, 1996) celebrate the contribution that psychologic entails with regard to conceptual clarity. Smedslund, although testifying that he adheres to a "strong" version of psychologic, states that "... psychologic is not intended to replace ordinary languages, but is only meant to amplify our conceptual power in limited professional and research contexts." (Smedslund, 1991b, p. 381).

As applied in the current paper, psychologic propositions have been treated as necessarily true, given the way language is understood. Through the application of psychologic in this paper I have come to believe that the conceptual clarity that psychologic introduces is beneficial to any experiment. Although I, on several occasions, was convinced of inconsistencies in the system, closer inspection always revealed the source of these perceived inconsistencies to be incomplete understanding. However, this does not entail that psychologic propositions should eradicate empirical investigations. On the contrary, empirical investigations provide an important corrective to what might otherwise be only metaphysical speculation. The belief that psychologic is compatible with empirical research precludes a "strong" position of this system. In light of this it can be argued that psychologic propositions ought to be considered as tentative, so that they do not strangle empirical inquiries into matters psychologic considers pseudoempirical.

Conclusion

The application of Smedslund's theory in this paper has shown that the conceptual clarity and logical structure that his theory provides can be a useful tool for explicating hypotheses and uncovering necessary relations in empirical studies. The price for conceptual clarity is the loss of flexibility that accompanies rigid definitions.

Given the status of empirical investigations both within psychology, and in society at large, it seems inevitable that empirical psychology will thrive and prosper. As for psychologic, though it represents a tremendous leap in the direction of conceptual clarity, its faith remains uncertain; dependant upon the assimilation into empirical literature.

References

- Backe-Hansen, E., & Schanke, A. (2004). Begreper som nøkler: Intervju med Jan Smedslund. [Concepts as keys: Interview with Jan Smedslund]. *Tidsskrift for Norsk Psykologforening*, *41*, 92-97.
- Bandura, A. (1978). On distinguishing between logical and empirical verification. A comment on Smedslund. *Scandinavian Journal of Psychology*, *19*, 97-99.
- Cozby, P. C. (1993). *Methods in behavioral research* (5th ed.). California: Mayfield Publishing Company.
- Danziger, K. (1990). *Constructing the subject: Historical origins of psychological research*. Cambridge: Cambridge University Press.
- Danziger, K. (1997). *Naming the Mind: How psychology found its language*. London: Sage.
- Davis, K. E. (1991). Two cheers for psychologic - and three reservations. *Psychological Inquiry*, *2*, 343-345.
- Fischer, S. (2001). *A history of writing*. UK: Reaction Books.
- Fiske, D. W. (1991). Common sense is just one strategy. *Psychological Inquiry*, *2*, 345-346.
- Gergen, K. J. (1985). Social constructionist inquiry: Context and implications. In K. J. Gergen & K. E. Davis, (Eds.), *The social construction of the person*. New York: Springer-Verlag
- Gergen, K. J. (2001). Psychological science in a Postmodern context. *American Psychologist*, *56*, 803-813.
- Gergen, K. J., & Gergen, M. M. (1999). Memory as discourse and the future of psychological research. *Scandinavian Journal of Psychology*, *40*, Suppl, 31-35.
- Gigerenzer, G. (1998). Surrogates for theories. *Theory & Psychology*, *8*, 195-204.
- Hagger, M. S., Chatzisarantis, N. L. D., & Biddle, S. J. H. (2002). The influence of autonomous and controlling motives on physical activity intentions within the Theory of Planned Behaviour. *British Journal of Health Psychology*, *7*, 283-297.
- Helstrup, T. (1999). The case of psychologic against memory research. *Scandinavian Journal of Psychology*, *40*, Suppl, 41-44.
- Hergenhahn, B. R. (1997). *An introduction to the history of psychology* (3rd ed.). California: Brooks/Cole Publishing Company.
- Howard, G. S. (1991). Stop the presses! I think my research is pseudoempirical. *Psychological Inquiry*, *2*, 347-350.
- Kuhn, T. S. (1970). *The structure of scientific revolutions* (2nd ed.). Chicago: The University of Chicago Press.

- Leary, D. E. (1991). History, empiricism, and pseudorationality. *Psychological Inquiry*, 2, 350-352.
- Mason, L., Moore, A., Edwards, J. E., McWuay, H. J., Derry, S., Wiffen, P. J. (2004). A systematic review of efficacy of topical rubefacients containing salicylates for the treatment of acute and chronic pain. *British Medical Journal*, 328, 995-997.
- Ossorio, P. G. (1991). Naive baseball theory. *Psychological Inquiry*, 2, 352-355.
- Overton, W. F. (1991). Narratives and observations in contemporary scientific psychology. *Psychological Inquiry*, 2, 356-357.
- Rognes, W. H. (1996). The psychologic of self esteem. Unpublished doctoral dissertation, The University of Oslo, Norway.
- Seedhouse, D. (2000). Logic, empiricism and ethics. *Journal of Health Psychology*, 5, 157-160.
- Shotter, J. (1991). Measuring blindly and speculating loosely: But is a "psychologic" the answer? *Psychological Inquiry*, 2, 363-366.
- Shweder, R. A. (1991). On pseudoempiricism, pseudoreductionism, and common sense. *Psychological Inquiry*, 2, 366-371.
- Smedslund, G. (2000a). A pragmatic basis for judging models and theories in health psychology: The axiomatic method. *Journal of Health Psychology*, 5, 133-149.
- Smedslund, G. (2000b). Psycho-Logic: A "conceptual toolbox" and "mind sharpener" for health psychologists: A reply to commentaries. *Journal of Health Psychology*, 5, 165-171.
- Smedslund, J. (1978a). Bandura's theory of self-efficacy: A set of common sense theoremes. *Scandinavian Journal of Psychology*, 19, 101-102.
- Smedslund, J. (1978b). Some psychological theories are not empirical. Reply to Bandura. *Scandinavian Journal of Psychology*, 19, 101-102.
- Smedslund, J. (1984). What is necessarily true in psychology? *Annals of Theoretical Psychology*, 2, 241-272.
- Smedslund, J. (1990). A critique of Tversky and Kahneman's distinction between fallacy and misunderstanding. *Scandinavian Journal of Psychology*, 31, 110-120.
- Smedslund, J. (1991a). The pseudoempirical in psychology and the case for psychologic. *Psychological Inquiry*, 2, 325-338.
- Smedslund, J. (1991b). Psychologic: A technical language for psychology. *Psychological Inquiry*, 2, 376-382.

- Smedslund, J. (1997). *The structure of psychological common sense*. Mahwah: Lawrence Erlbaum Associates.
- Smedslund, J. (2002). From hypothesis-testing psychology to procedure-testing psychologic. *Review of General Psychology, 6*, 51-72.
- Teigen, K. H. (1999). Smedslund the illusionist: How psychology came to look like a deductive science. *Scandinavian Journal of Psychology, 40, Suppl*, 89-92.
- Vittersø, J. (2002a). Psykologikk og emosjoner. [Psychologic and emotions]. *Tidsskrift for Norsk Psykologforening, 39*, 43-44.
- Vittersø, J. (2002b). Kunnskap om emosjoner. Kommentar til Jan Smedslund. [Knowledge regarding emotions. A comment to Jan Smedslund]. *Tidsskrift for Norsk Psykologforening, 39*, 437-440.
- Wallach, M., & Wallach, L. (1998). When experiments serve little purpose: Misguided research in mainstream psychology. *Theory & Psychology, 8*, 183-194.
- Wehmeier, S. (Ed.) (2000). *Oxford Advanced Learner's Dictionary* (6th ed.). Oxford: University Press.
- Wierzbicka, A. (1992). Defining emotional concepts. *Cognitive Science, 16*, 539-581.
- Wilde, J., Goerss, B., & Wesler, J. (2003). Are all phonemic awareness tests created equally? A comparison of the Yopp-Singer and the task of auditory analysis skills (TASS). *Journal of Research in Reading, 26*, 295-303.
- Williams, R. N. (1991). The pseudofundamental in psychology: Psychologic and psychologism. *Psychological Inquiry, 2*, 371-374.