

Introduction to this book

It is evident from morbidity and mortality statistics that helping people change their health risk behaviour(s) is one of the major global challenges of health promotion in our times. The Transtheoretical Model (TTM) developed by Prochaska, DiClemente, Velicer, and other colleagues has had considerable impact on research and intervention planning for the modification of health-related behaviours like smoking, exercise, and diet, among others. After having become well established as a theoretical framework in the U.S., the TTM has recently begun to immensely stimulate health research and intervention planning throughout Europe and other areas of the world. About 25 years after the TTM was introduced, it is time to reflect on its accomplishments and on the direction of future research. In order to do this, we organized a conference titled "Research on the Transtheoretical Model: Where are we now, where are we going?" in August 2004 in Marburg, Germany. The goal of this conference was to bring together some of the leading international researchers in the field of behaviour change in order to discuss current trends in health promotion research based on theoretical frameworks like the TTM. While we initially had expected to have a small circle of highly specialized researchers, the interest in the conference turned out to be higher than we anticipated. We are particularly glad that participants from all over the world found their way to Marburg, reflecting the large interest that health researchers have developed for the TTM in recent years. The contributions in this book are the abstracts of the oral and poster presentations of the TTM conference in Marburg. The major aims of the conference were to have presentations and discussions focus on expanding and integrating theoretical aspects and on developing and evaluating theory-based interventions. These aims are reflected in the variety of theoretical approaches, study designs and health behaviour areas across the contributions to the conference. The presentations report the results of critical evaluations of the Model, integration of TTM constructs with other models, replication of important previous findings as well as of several intervention studies. Results are presented from different settings like the general population, physicians offices, or hospitals. Studies target the general population, clinical populations, underserved populations, and various age groups. Finally, the presentations focus on different behaviour areas, such as smoking, alcohol consumption, diet, exercise, oral hygiene behaviour, or organ donation. While most contributions focus on the results of single studies or analyses, a small number of main presentations integrate results and ideas from selected areas

(Hein de Vries, Carlo DiClemente, Kerry Evers, Stefan Keller, Ralf Schwarzer, Wayne Velicer).

The conference was seen as a platform for exchanging current research results and new ideas as well as a forum for coordinating international research efforts. We hope that this short volume with its diverse contributions will also help stimulating new research and international networking. In order to facilitate this, we have also included the contact addresses of all the active contributors participating at the TTM meeting. We encourage all readers to make use of this opportunity and to help developing coordinated efforts which will meet the challenges of research on health behaviour change.

Finally, we would like to express our gratitude to all the contributors and participants of the conference, to the colleagues who contributed to this little book (who were generous enough to submit these extended abstracts under considerable time pressure), to all the colleagues who helped organizing the conference and this book, and to the Deutsche Forschungsgemeinschaft (DFG) for their financial support.



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Foreword by James O. Prochaska

The Transtheoretical Model (TTM) was originally intended to be a more comprehensive and integrative approach to psychotherapy and behavior change. At the time it was developed, there were more than 300 theories of therapy and behavior change. The hope was that TTM could provide a framework to better understand, predict, and help populations across a full range of stages, behaviors, cultural contexts and intervention modalities. This volume reflects the progress that is being made in applying the model across a broad range of behaviors including anxiety, alcohol abuse, depression, dental flossing, diet, exercise, lower back pain, marijuana, and smoking. It also reflects application of TTM in an increasing number of countries and a diversity of cultural contexts. The spirit of this volume is the collaborative nature of science, where we can learn from each other even though we specialize in different behaviors, intervention modalities, and cultural contexts.

One of the studies in this volume from our Cancer Prevention Research Center demonstrates the special knowledge that can be generated when integrating data from across a broad range of behaviors, countries and contexts. The research by Kara Hall and Joseph Rossi applied a meta-analysis of the cross-sectional relationships between the stages of change and decisional balance for changing behaviors. There were 146 data sets on 55 behaviors spanning 18 countries carried out in 9 different languages. Many might expect that attempting to integrate across so many behaviors and so many contexts would produce so much noise or variance that no clear signals or patterns would be produced.

The findings actually generated one of the most eloquent and clear patterns that I have had the opportunity to observe. The decisional balance measure almost always resulted in a two-factor solution representing the pros and cons of changing. The two variables correlated only about .24. In the precontemplation stage the cons of changing were about .7 S.D. greater than the pros. In the contemplation stage, the pros and cons were about equal, reflecting the ambivalence that is usually part of this stage. In the preparation stage, the pros and cons had crossed-over with the pros about .4 S.D. higher than the cons. In the maintenance stage, the pros were .7 S.D. higher than the cons, which was just the opposite of the pattern in precontemplation.

These patterns of results and the effect sizes on which they were based were not found to differ significantly by the country or language in which they were carried out or by the age of the population studied. There were no significant

differences in effect sizes depending on whether the studies were done by developers of TTM, their students or collaborators or by researchers with no affiliation with the developers. There were no significant differences across most types of behaviors, but there were differences between regular behaviors, like smoking, diet and exercise and irregular behaviors, such as screening for breast, colon or prostate cancer. The clarity and consistency of these patterns have important implications for developing interventions that are tailored for populations in each stage of change.

The results of this meta-analysis and other results abstracted in this volume reflect the progress that is being made for developing a more comprehensive and integrative framework for behavior change. But so much still needs to be done. The old action paradigm still drives so much of research and so much of practice. Consider for example, that the U.S. Public Health Consensus 1996 Clinical Guidelines for Treatment of Tobacco had access to more than 3,000 studies on tobacco. These studies were able to provide an evidence base for a broad variety of treatments for motivated smokers, defined as those who were intending to quit in the next thirty days. There was a lack of adequate evidence for treatments of unmotivated smokers in the precontemplation and contemplation stages, even though they make up over 80% of all smokers in the U.S. and over 90% in some countries, like Germany, China and Turkey.

By the year 2000, there were over 6,000 studies on tobacco and the second edition of the Clinical Guidelines had evidence for an even broader range of treatments for motivated smokers. But still, the editors concluded that there was insufficient evidence for treatments for the vast majority of smokers who were not prepared to quit. How troubling it is that so much research and so much treatment is still devoted to such a relatively small percentage of populations with the most deadly of behaviors.

Fortunately, as reflected in some of the abstracts in this volume, there are now evidence-based treatments based on the Transtheoretical Model for entire populations of smokers, including the large majority who are not prepared to quit. While there are valid criticisms of TTM, it cannot be said that TTM researchers and practitioners ignore the vast majority of at-risk populations who need to be studied the most and who need help the most. Hopefully, this volume can serve as an inspiration for research and interventions designed for entire populations in different nations who would benefit from evidence-based practices for a broad range of health and mental health behaviors.

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Alcohol use and smoking: Readiness to change and self-efficacy in a primary health care sample

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Keywords: motivation; importance; confidence; alcohol use; smoking

Both the Transtheoretical Model of Intentional Behavior Change (Prochaska, DiClemente & Norcross, 1992) and Social Learning Theory (Bandura, 1986) provide a general framework for research on client motivation. The transtheoretical model assumes that intentional behavior change involves passing through a sequence of discrete stages. Based on the results of numerous studies and previous versions of the model, Prochaska, DiClemente and Norcross (1992) described five stages of change: (1) Precontemplation, (2) Contemplation, (3) Preparation, (4) Action, and (5) Maintenance. According to social learning theory, self-efficacy is the most powerful predictor of behavior change. Bandura (1986) defines self-efficacy as “people’s judgments of their capabilities to organize and execute courses of action required to attain designated types of performances” (p. 391). In line with social learning theory, self-efficacy has been shown to increase during the course of treatment and to predict treatment outcome. A number of elaborated questionnaires have been developed to assess an individual’s readiness to change and his or her self-efficacy (e.g., Miller & Tonigan, 1996). Most recently, Miller and Rollnick (2002) proposed a simple measure of readiness to change (importance) and self-efficacy (confidence). The present study aimed to establish the clinical utility of this measure in a primary health care sample.

Eight thousand eighty-nine volunteers (3814 males; mean age of 36.08 years, $SD = 11.30$; positive screening; $N = 918$) participated in a randomised controlled trial on the effects of a brief intervention adapted from motivational interviewing on alcohol use and smoking behavior. A brief questionnaire on background variables, drinking habits, smoking behavior, negative consequences of excessive alcohol use, readiness to change, and perceived self-efficacy was administered preceding the consultation. During the consultation, practitioners initiated a change talk and offered feedback regarding the patient’s level of alcohol use (percentile feedback). Readiness to change (“How

important would you say it is for you to cut down your drinking?") and self-efficacy ("How confident are you that you could cut down your drinking?") were assessed using two eleven-point rating scales (importance: 0 = not at all important, 10 = extremely important; confidence: 0 = not at all confident, 10 = extremely confident).

Readiness to change alcohol use increased following percentile feedback ($M = 4.77$ vs. 5.09 , $p < .001$). Self-efficacy was inversely correlated with readiness to change drinking habits ($r = -.25$, $p < .001$). Readiness to change did not differ for alcohol use and smoking. However, confidence in one's ability to stop smoking differed considerably from confidence in one's ability to cut down alcohol use ($M = 4.55$, $SD = 3.35$ vs. $M = 7.81$, $SD = 2.44$; $p < .001$).

Drinking refusal self-efficacy indicated optimism rather than pessimism. These findings are in accordance with the results of previous research: Problem drinkers appear to be overconfident (e.g., Demmel & Beck, 2004). However, the present results suggest that inflated self-efficacy might be restricted to certain behavioral domains. The enhancement of readiness to change following percentile feedback should be interpreted with caution. Both, inflated self-efficacy and enhanced motivation might be due to a social desirability bias.

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Drinking patterns and motivation to change in general practice patients with alcohol use disorders

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Keywords: alcohol abuse; binge drinking; general practice setting; longitudinal data

In the last several years, research on health consequences from drinking has devoted increased attention on the patterns of drinking compared to overall consumption. Frequent binge drinking, in particular, has been identified as increasing among young people and some initial intervention strategies have been developed, focusing mainly on binge drinking episodes in college students. Little is known about the occurrence of binge drinking in representative samples. The present study aims to address the association between drinking patterns and motivation to change according to the Transtheoretical Model (TTM) of behavior change.

Participants were recruited from general practices in two northern German cities. All consecutive patients between 18 and 64 years of age were screened for alcohol consumption using the Alcohol Use Disorders Identification Test (AUDIT) and the Luebeck Alcohol Dependence and Abuse Screening Test (LAST). Patients who screened positive were asked to participate in an intervention study and received a standardized diagnostic interview by phone, augmented by a questionnaire including a standardized assessment of TTM-variables. Stages of change were assessed using the Readiness to Change Questionnaire (RCQ). As a gold standard for alcohol use disorders, the Munich-Composite International Diagnostic Interview (M-CIDI) was used. From this data, subjects were classified into three groups: (a) alcohol use disorders (AUD; N=183), (b) at-risk consumption without AUD (N=112) and (c) binge drinking without AUD or at-risk-consumption (N=113). After the diagnostic procedure, subjects were randomly assigned to a control group or two inter-

vention groups. The first intervention group was a stepped care intervention, starting with TTM-tailored expert-system feedback, and, in the case of no success, followed by one to three counseling sessions based on Motivational Interviewing. The second intervention group represented a fixed care intervention, consisting of four counseling sessions based on Motivational Interviewing.

Subjects with frequent binge drinking based on a modified WHO-Phase II intoxication criteria (60/80 gms/pure alcohol at one sitting at least twice a month) without additional at-risk consumption or AUDs were significantly younger than subjects in the other groups. They showed the lowest motivation to change, followed by at-risk drinkers and subjects with AUDs. In accordance with the TTM framework, groups also differed on processes of change with binge drinkers showing the least engagement. When controlling for differences in stage of change using logistic regression, the main differences between binge drinkers and subjects with at-risk consumption and/or AUDs involved self-reevaluation and helping relationships. In a 12-month-follow-up, preliminary analysis based on 307 study participants showed that binge drinkers in contrast to both other groups revealed significantly less changes in drinking habits and showed no reduction in their overall average consumption. Furthermore, they tended to show less stage progress and to respond less to the interventions, although these differences did not reach statistical significance.

Drinking patterns strongly influence motivation to change. Especially young people showing frequent binge drinking according to the modified WHO criteria and a high rate of subjects in precontemplation stage are a critical group for early intervention based on the TTM and principles of Motivational Interviewing. Interventions especially targeted for this population need to be developed.

The Expert Test and Report on Alcohol (ExTRA): Development and evaluation of a computerized software

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Keywords: alcohol abuse; computer-based intervention; expert system; general practice setting

One cost effective approach to brief interventions that has proven to be effective in smoking cessation is the use of computer-based expert systems. The interventions are designed to utilize client information in producing individualized information and interventions matched to the client's motivation to change according to the Transtheoretical Model (TTM) of behavior change. In the alcohol field, an expert system based on the core constructs of the TTM has not been developed to date with the exception of one expert-system specifically designed for binge drinking college students. Furthermore, all existing expert-system interventions for problem drinkers have been evaluated using volunteer samples. As part of the study "Stepped care intervention for problem drinkers" (SIP) the computerized Expert Test and Report on Alcohol (ExTRA) was developed. The intervention includes stage of change, pros and cons of drinking, processes of change, and alcohol-related self efficacy as well as a normative feedback on individual drinking amounts and associated relative health risks.

The present study provides empirical data from the first evaluation of the expert system based on a proactively recruited sample of general practitioner (GP) patients. Data were analyzed with special emphasize on the relative effectivity in accordance with the TTM. The SIP study was conducted in two northern German cities. All GP patients between 18 and 64 years were screened for alcohol consumption using the Alcohol Use Disorders Identification Test (AUDIT) and the Luebeck Alcohol Dependence and Abuse Screening Test (LAST). Screening positive subjects were asked to participate in the study and received a standardized diagnostic interview by phone, augmented by a questionnaire including standardized assessment of TTM-variables. Subjects with an alcohol use disorder (alcohol abuse or dependence according to

DSM-IV), at-risk alcohol consumption according to the British Medical Association or binge drinking, defined as 60/80 gms of alcohol on one occasion two times per month or more often were randomly assigned to a control group (N = 138), a stepped care intervention starting with a computerized feedback (N = 138), and a fixed care approach starting with counselling and a computerized feedback (N = 132).

This analysis was restricted to the two intervention groups because the control group was only contacted at the 12 month follow-up. One month after the baseline intervention, subjects in the intervention conditions were asked by phone about changes in their drinking habits, stages of change, and their perception of the feedback based on the expert system. The main outcome assessment included reduction in average daily alcohol consumption which was assessed using a quantity-frequency measure and stages of change which was assessed by the Readiness to Change Questionnaire (RCQ). In addition, participants rated the appropriateness and helpfulness of the feedback on a five-point Likert-scale.

Both groups showed no differences in alcohol-related diagnosis, drinking habits or socio-demographic variables at baseline and at the first follow-up. However, both groups significantly reduced their alcohol intake and showed a substantial progress in the stages of change. While alcohol consumption remained stable in participants in the Precontemplation stage, substantial reduction was observed in participants in the Contemplation and Preparation stage at baseline. In general, the feedback was well received by the participants with more than 60% rating the feedback as at least somewhat appropriate or helpful. The helpfulness of the feedback was rated especially high by individuals who were contemplating reducing alcohol consumption at baseline. Participants who achieved stage progress between baseline and the first assessment rated the feedback significantly more appropriate and helpful than subjects who remained in their stage.

ExTRA has proven to be equally effective as a single intervention compared to a traditional counseling session combined with the feedback. Findings give a first indication that expert system interventions can provide a cost-effective, viable and efficacious means of intervention in the alcohol field. This is in line with findings from the field of smoking cessation. Further research testing the expert system against untreated controls using representative samples is currently in preparation.

Determinants of readiness for organ donation

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Keywords: organ donation, convenience sample; cross-sectional; socio-demographic determinants for readiness

While the majority of the German population is in favour of organ donation, approximately only 12% carry an organ donation card. As a result, there is a considerable discrepancy between the number of organs needed and the number of organs that are transplanted in Germany (Schulz et al., 2002). This study evaluates relevant determinants for the readiness to become an organ donor. The focus lies on the significance of the constructs of the Transtheoretical Model (TTM) in this context.

In a cross-sectional design, a convenience sample of $n=325$ individuals (55% female, mean age 38 years, $SD=15$) were asked to fill out a questionnaire which included socio-demographic variables, attitudes toward organ donation and the TTM constructs (stages of change, decisional balance, self-efficacy) for the target behaviour "having an organ donation card and informing the family about the decision to become an organ donor". The TTM constructs were adaptations of measures developed by Robbins et al. (1998, 2001).

Approximately 96% indicated that they had heard about organ donation. Especially physicians were seen as a trustworthy source for information (by 63%), whereas only 2% trusted information from "stars" who promote organ donation in infomercials. While approx. 61% of the sample had not decided to become an organ donor and had no intentions to do so in the following six months (precontemplation stage), 10% were in the contemplation, 12% in the preparation, and 17% in the action stage. The readiness to become an organ donor was unrelated to age, gender, education level, or living area (city vs. country). The relation between stages and religion was significant, mainly due to a very high proportion of, mostly Muslim, precontemplators in the small subgroup "other religions". Additionally, individuals who had a friend or relative who had received an organ were more likely to be in higher stages. The psychometric properties of the newly developed scales for the TTM core constructs were good. Individuals in the pre-contemplation stage had a lower self-efficacy and perceived the pros significantly less important and the cons significantly more important than individuals in the other stages of change.

The results indicate that the decision process about becoming an organ donor can be described to some extent by the constructs of the TTM. The TTM constructs especially differentiate between precontemplators and higher stages. Combining the results from attitudes toward organ donation with the motivational variables could result in material that specifically addresses precontemplators and encourages them to contemplate taking the necessary measures. However, the findings should be replicated in a study with a larger and more representative sample. Additional studies should also ensure that the TTM scales, which were translations of American instruments, include all culturally relevant items for the German population.

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Matched and mismatched interventions for individuals in early stages of change for using dental floss

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Keywords: dental floss, minimal intervention; stage movement; pilot study

The Transtheoretical Model (TTM) initiated a shift from thinking about health behavior change as a continuous process to postulating that people move through a series of qualitatively different stages. One of the criticisms of the Transtheoretical Model refers to the validity of the stages of change. Match-mismatch designs, where individuals receive a stage-appropriate vs. an inappropriate intervention, have been proposed as a way to test stage validity (Weinstein et al, 1998). This study has two aims: First, to confirm the basic assumptions about the relation of the TTM core variables to each other in the context of the daily use of dental floss. Second, to test the effects of matched versus mismatched TTM-based interventions for flossing. Target group were individuals in the precontemplation/contemplation stage for flossing.

The convenience sample consisted of n=254 individuals who were recruited in four dentists' practices. The mean age was 41.9 years (SD=15.3); 56.5% were women. Previously developed measures were assessed through questionnaires (stage algorithm for daily flossing, decisional balance, self-efficacy for daily flossing, and dental health-related measures). This total sample was used to analyze the cross-sectional relations of TTM constructs and other dental health-related variables. For the intervention part of the study, only n=134 individuals in the precontemplation and contemplation stages were included. They were randomly assigned to one of four groups: A) control group/assessment only, B) matched intervention (brochure aiming at experiential processes of change), C) mismatched intervention (information on flossing and one pack of dental floss), and D) combined (brochure plus dental floss). The post-test took place six months after baseline testing. Stage progression was defined as the major outcome variable. The drop-out rate was acceptable: 112 (84%) of the original 134 patients in precontemplation/contemplation could be reached at t2.

Cross-sectionally, there were no differences across the stages for age or education. Women were slightly more likely to be in higher stages than men ($p < .05$). An almost linear increase of an index for dental health behaviour across the stages underlined the validity of the staging algorithm. The perceived advantages (“pros”) of flossing increased by approx. 1.2 SD over the stages and peaked in the maintenance stage while the perceived disadvantages (“cons”) decreased by approx. 0.8 SD and were the lowest in the maintenance stage. Self-efficacy also increased by approx. 1.4 SD across the five stages.

Regarding stage movement between pre- and post-test, significantly more individuals in both, the matched condition and the mismatched, condition progressed by at least one stage than individuals in the control group. The combination group did not differ significantly from the control group. There were no differences between the matched and the mismatched condition in terms of stage progression.

The cross-sectional results confirm the basic validity of the TTM for the daily use of dental floss. Generally, the results on the relation of the TTM-core variables (stages and decisional balance, self-efficacy) to each other replicate the findings of Keller & Schulze (2004; see also Schulze & Keller in this volume) in Germany, as well as recent international findings (Tillis et al, 2003). Regarding the intervention part of the study, the results could not show that a stage-matched intervention for individuals in the precontemplation or contemplation stage is more successful than a mismatched, action-oriented intervention. However, the interpretation is limited by power problems due to higher than expected selection effects in the sample. Future investigations should focus on the replication and extension of these findings with larger samples and may wish to examine interventions that are tailored to the full set of stages. The present study illustrates the value of experimental designs that compare stage-matched and stage-mismatched interventions. We would argue that more of these experiments are needed, not only for dental flossing but also for other health behaviors. The results from such experiments can contribute to test the theory (i.e. regarding the validity of stages in general) as well as to develop adequate interventions which make the best use of available resources.

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The role of TTM'S processes of change in the domain of physical activity

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Keywords: processes of change; physical activity; longitudinal data

Comparably few studies use longitudinal designs to analyze the role of TTM's processes of change (POC) in the domain of physical activity. Furthermore, these studies provide limited evidence that stage transition is actually dependent on the use of POC. In one study, the absence of significant paths from POC to exercise behavior could be due to a long time lag (three years) between assessment points (Nigg, 2001). In another study, unclear psychometrics for the instrument to assess POC may have contributed to its sobering results (Plotnikoff, Hotz, Birkett, & Courneya, 2001). Our longitudinal study addresses these limitations.

Data was gathered from a self-selected sample, participating in a state-wide public health campaign to enhance exercise status. Stages and processes of change of 5.756 adults (87.3% female, mean age 43.9 years; 12.7% male, mean age 49.8 years) were assessed at the beginning of the campaign. This large data set was used to analyze the factorial structure and some psychometrics of the recently published German instrument to measure POC in the domain of physical activity (Maier & Basler, 2003). Five weeks after the beginning of the campaign, the same people were addressed to fill out questionnaires again. The resulting longitudinal data set contains information on 1.059 responding persons (89.2% female, 10.8% male). Data from this smaller set was used to explore the role of POC in stage progression by calculating repeated measures MANOVAs.

Factorial structure and psychometrics (POC scales): Confirmatory factor analyses show that the theoretically postulated structure of the POC instrument does not match with the data of our sample. This is true for a more complex second order model, in which items were assigned to five experiential and five behavioral processes (maximum likelihood estimation results in an inadmissible model because of negative variances; $\chi^2 = 11037.89$, $df = 394$; CFI = .84), as well as for a simple first order model, in which items measuring experiential processes were separated from those measuring behavioral processes ($\chi^2 =$

22136.55, $df = 404$; CFI = .69). As a consequence of these findings, exploratory factor analyses were performed (this was done with one of two random subsets of the data). The most plausible solution of these main component analyses indicates that the former scales dramatic relief, self liberation and social liberation should be dropped because of uninterpretable item loadings. The resulting five-factor structure consists of three original POC-subscales environmental reevaluation (Cronbach- $\alpha = .74$), consciousness raising ($\alpha = .74$) and helping relationships ($\alpha = .85$). Thereby leaving the TTM framework, two "new" subscales emerged: Items of the POC scales self reevaluation and reinforcement management form a new scale, named outcome expectancies ($\alpha = .85$). Items of the former scales counter conditioning and stimulus control can be interpreted best as commitment ($\alpha = .80$). Confirmatory factor-analyses (using the beforehand separated subset) indicate this five-factor structure to be invariant across four out of the five stages of change (contemplation, preparation, action and maintenance; $\chi^2 = 5339.21$, $df = 1019$, CFI = .90, RMSEA = .03).

Explorations on stage progression (preparation to action): At the beginning of the campaign, stage distribution in the longitudinal sample ($N = 1.059$) was 2.1 % persons in Precontemplation, 21.1% in Contemplation, 28.6% in Preparation and 46.9% in either Action or Maintenance (1.5% handicapped persons). From T1 to T2, 43 persons of our sample remained in the preparation stage. 114 individuals shifted from preparation to action. Emphasis of analysis was laid on this stage transition. Repeated-measure analyses of variance (MANOVA) were conducted with 'transition vs. no transition' as a factor and the five strategy scales as dependent variables. Calculations resulted in a non-significant interaction 'transition \times time' ($F_{5,151} = 1.10$, $p = .36$, $1-\beta = .99$), and two significant main effects ('time': $F_{5,151} = 7.28$, $p < .001$, $\eta^2 = .19$; 'transition': $F_{5,151} = 4.79$, $p < .001$, $\eta^2 = .14$). The significant main effect for 'time' (as well as the non-significant interaction effect) should be attributed to the fact that all subjects participated in the public health campaign, whereas only some subjects progressed between stages. Univariate analyses for specifying the 'transition' main effect show that subjects, before shifting from preparation into action stage, already reach significantly higher scores for environmental reevaluation, consciousness raising, helping relationships and outcome expectancies, compared to those subjects who do not progress between stages.

Two main conclusions can be drawn from our study. In general, first of all TTM researchers should have a close look at the internal structures and the psychometrics of POC scales. Our result shows that the validity of the German instrument is somewhat unclear. This makes it difficult to attribute findings directly to TTM postulations. Secondly, it may be promising to focus on the role

of POC (or other constructs; see above) shortly before and shortly after stage progression. Therefore, it is essential to initiate more longitudinal research.

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Client motivation and treatment outcome in a clinical sample of problem drinkers

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Cognitive processes related to client motivation are important mediators of alcoholism treatment outcome. Both social learning theory (Maisto, Carey, & Bradizza, 1999) and the transtheoretical model of intentional behavior change (Prochaska, DiClemente, & Norcross, 1992) provide a general framework for research on client motivation. A number of studies established the relationship between treatment outcome on the one hand and self-efficacy (e.g., Goldbeck, Myatt, & Aitchison, 1997), alcohol expectancies (e.g., Brown, 1985), and readiness to change (e.g., Isenhardt, 1997) on the other. The present study aims to expand the research on client motivation and treatment outcome by establishing the relative utility of self-efficacy, alcohol expectancies, and readiness to change in predicting drinking behavior following inpatient treatment for alcohol dependence. Furthermore, the relationship between expectancies and readiness to change is examined.

Ninety-three volunteers from an inpatient treatment unit of a psychiatric hospital participated in this study. Over a period of three months subjects were selected from successive admissions for participation in the study if they met the following criteria: (1) alcohol dependence according to ICD-10; (2) maximum age of 60 years; (3) no cognitive or verbal impairment; (4) no primary diagnosis of drug dependence (including dependence on illicit drugs, sedatives, hypnotics or anxiolytics); (5) resident of the local community. Ten subjects were excluded from the study due to incomplete data. The final sample consisted of 83 inpatients (mean age of 43.67 years, $SD = 8.41$). Of the sample, 81% were male, 23% were married, and 53% were currently unemployed. The majority of the entire sample (90%) reported at least one previous detoxification (mean number of previous detoxifications = 9.95, $Mdn = 4.5$, $SD = 14.57$, $Max = 80$, information was not provided by one subject).