The effectiveness of Integrated Psychological Therapy (IPT) for schizophrenia patients

A meta-analysis covering 28 independent studies

V. Roder¹, D.R. Müller, H.D. Brenner

Summary

Over the course of the past 24 years, research groups in eight countries have carried out 28 independent evaluation studies on IPT with the inclusion of 1,329 schizophrenia patients. The present study examines the effectiveness of IPT under varying treatment conditions by means of a meta-analytic review. The most salient results indicate favorable mean effect sizes for IPT in comparison to control groups (placebo-attention conditions, standard care). Moreover, the superiority of IPT continues to increase during an average catamnestic phase of 8.1 months. IPT obtains similarly favorable effects in contrasting functional areas (neurocognition, social behavior, psychopathology), as well as in different assessment formats (expert ratings, self-reports, psychological tests). A comparison of the distinct settings used in IPT and for the control groups shows the superiority of IPT in any given therapy or site condition. An analysis of sub-samples, incorporating inpatients, outpatients and other patient groups in various rehabilitation phases, reveals correspondingly favorable effects. In addition, the selection of exclusively high-quality studies yields comparable results. In summary, the present meta-analysis corroborates evidence of IPT as an "empirically validated treatment" according to APA guidelines.

Keywords

Schizophrenia, cognitive-behavioral psychotherapy, treatment conditions, rehabilitation, meta-analysis

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The treatment of schizophrenia patients in present-day psychiatric care is grounded in the following therapeutic trias: reliance on non-specific socio-therapeutic rehabilitation, as well as on the two fields of psycho-pharmacotherapy and psychotherapy. These disciplines underwent important developments during the past few decades, i.e. a) a paradigm shift from inpatient-preference to increased outpatient and community-integrated psychiatric treatment (cf. Brenner et al. 2000, Becker & Vasquez-Barquero 2001, Becker et al. 2002); b) the development of atypical neuroleptics as an advancement in psycho-pharmacotherapy (cf. Keefe et al. 1999, Harvey & Keefe 2001, Davis et al. 2003) and, finally, c) a body of empirical evidence pointing to the superiority of cognitive-behavioral interventions in comparison to other psychotherapeutic treatments (cf. Wunderlich et al. 1996, Mojtabai et al. 1998, Lehmann & Steinwachs 2003).

Cognitive-behavioral approaches may be bracketed into the following four main groups, commensurate with the respective objectives (Roder et al. 2002a, Pilling et al. 2002a,b): 1) social-skills and problem-solving training (SST); 2) cognitive remediation; 3) cognitive-behavioral therapy to reduce persistent positive symptoms (CBT); 4) psycho-educational and family-therapy approaches. A number of meta-analytic studies have validated the effectiveness of these various approaches (cf. Mojtabai et al. 1998, Gould et al., 2001, Rector & Beck 2001, Kurtz et al. 2001, Pilling et al. 2002a, Krabbendam & Aleman 2003a), whereby Integrated Psychological Therapy (IPT, Roder et al. 1988, 2002a, Brenner et al. 1994) is considered to span the first two main groups on the strength of its methodology.

Integrated Psychological Therapy (IPT)

IPT is recognized as one of the first systematic, empirically-founded and manualized treatment approaches for schizophrenia patients. The German edition of the IPT manual, which is already in its fifth printing (Roder et al. 2002a) and has since been translated into 10 languages, would suggest a wide and continuing acceptance of this cognitive-behavioral group therapy. IPT incorporates a total of five subprograms (see Fig. 1).

Figure 1

These multi-level subprograms (SP) are applied sequentially. The first two SP primarily target basic disorders in neurocognition and social cognition. IPT treatment of neurocognitive deficits differs from the conventional, repetitive training of so-called "cold" cognitions, in that specific interactive exercises are practiced within the group. The final three SP focus on concentrating patient resources in an attempt to (re-)gain social competence. The actual accomplishment of each individual SP depends on the resource-oriented, differential indication of the patient (for the relevant criteria, see Roder et al. 2002a). Therefore, the schematic sequence as displayed in Figure 1 is not viewed as conclusive.

In order to reflect advancements made in the areas of social cognition, as well as in social and problem-solving behavior, the therapeutic conception of IPT has been amended to include Emotional Management Therapy (EMT, Hodel & Brenner 1996), together with specific therapy programs for vocational, residential and recreational topics (WAF, Roder et al. 2001, 2002b, 2002c).
Methods
During the past 24 years, research groups stationed in Switzerland, the USA, Canada, Japan, Germany, the Netherlands, Italy and Spain have independently carried out and published studies investigating IPT, or a combination of several IPT subprograms, by using a total sample of 1,329 schizophrenia patients (diagnosed according to ICD or DSM). Those individual studies which focused on the two aforementioned amendments to IPT (WAF, EMT) were included in this present meta-analysis only if these amendments were combined with IPT. Of these, only one study met this criterion (Briand et al. 2003), in that EMT was used as an additional subprogram to IPT. In two of the studies under review, IPT was compared with standard care based on pharmacotherapy and social therapy, and with a placebo-attention condition (non-specific group activity). In 11 studies, IPT was compared with standard care, in eight studies with a placebo-attention condition, and in two studies, IPT was used as a control condition to another treatment approach. Five studies dispensed with a control group (field studies), or simply investigated questions of differential indication. A review of these 28 studies can be found in Table 1.

Table 1
IPT has been applied to patients in various rehabilitation and setting conditions, for example, to symptom-stabilized patients - according to ICD 10 defined as patients exhibiting continued symptoms (F20.x0) or residual symptoms between episodes (residual state stable) (F20.x2), in accordance with existing therapeutic indication - or to patients in a post-acute phase of remission following an exacerbation attributable to either inpatient and outpatient sectors in academic and non-academic institutions. The quality of the studies is heterogeneous in terms of sample size and design, i.e. in 23 studies (82.1%) a controlled design was used, while in 14 of these (60.8%) a randomized assignment of the patients was implemented. In 22 studies (78.6%) expert rating was used, and in six (27.3%) blind ratings were applied. The heterogeneity of the scientific standard of quality is attributable to changing therapy settings and designs over the 24-year period prior to publication. For example, earlier studies used a higher frequency of therapy (Spearman’s correlation, two-tailed: r=-.56, p<.01, K-studies=28) and smaller patient samples (r=.41, p=.03, K=28).

The purpose of the present meta-analysis is to review the effectiveness of IPT when applied under varying clinical conditions. In order to cover the entire spectrum of possible real care and therapy conditions, in a first step, all existing IPT studies were included. Of special interest are: 1. the global therapy effect (defined as the mean of all assessed outcome variables) of therapy and the catamnestic phase; 2. the three main functional domains of schizophrenia patients (cognitive domain, social behavior and psychopathology); 3. moderators (patient, setting and site conditions); 4. predictors of outcome.

In a second step, the results of all IPT studies were validated. Hence, those studies which fulfilled the criteria for randomized controlled trials (RCT), specially declared randomized design, controlled assessment of medication, and blind ratings, were selected.

Data analysis
To include all of the studies in the analysis, effect sizes (ES) within the compared groups
were calculated first, in accordance with Smith and Glass (1977). As empirical studies have indicated higher effects for patients with placebo-attention conditions than for patients with standard treatment (Wykes et al. 1999, Spaulding et al. 1999), these two forms of control groups were dealt with separately. In addition, ES between groups were calculated according to Cohen’s d (Cohen 1988). ES can generally be categorized as small (0.2), medium (0.5) or large (0.8) (Cohen, 1988). The control of possible influence by unequal sample size and standard error is based on a "fixed effects model": the ES of each study are weighted by their inverse variance (ES, w, d_w) (Shadish & Haddock 1994). The homogeneity of variance of the ES of the individual studies was tested by calculating Hedges’s Q_w (Hedges 1994). To measure the significance of the weighted ES, the confidence interval and z-transformation of the ES were used (Shadish & Haddock 1994). In order to identify differences between groups and sub-categories, Hedges’s Q_B was calculated (Hedges 1994). Taking the so-called "file drawer problem" into account, the number of unpublished studies without effects needed to abrogate possible significant results was determined as a control of possible publication bias ("fail safe", Rosenthal 1994). Finally, in order to test the correlation and predictor hypothesis, non-parametric Spearman’s correlations were calculated. Owing to the small statistical power, no further inference statistical analysis was applied.

Results
The patient characteristics of the entire sample comprising 1,329 patients in 28 studies are displayed in Table 2. As a result of the different phases of patient rehabilitation in each study, the duration of illness and hospitalization is heterogeneous. All studies applied psycho-pharmacotherapy as an adjuvant, whereby eight studies provide information on the daily dose of antipsychotics.

Table 2

<table>
<thead>
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<th>Treatment setting and drop-out rate</th>
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<td>Therapy duration for each of the specific interventions (IPT) and the non-specific placebo-attention condition is summarized in units of weeks and 60-minute therapy sessions, whereby the mean treatment phase amounts to 17.4 weeks (95% confidence interval, CI: 11.9-22.9 weeks), or 47.4 hours respectively (CI: 36.6-58.2). The mean frequency of sessions is 3.2 sessions a week (CI: 2.7-3.7). In 14 studies, the profession and specific qualifications of the therapist are mentioned. In 92.8% of the studies, primarily cognitive-behavioral trained psychologists were involved, and in 35.7%, psychiatrists trained in IPT additionally participated as main therapists. 14 studies (50%) indicate the drop-out rate during the treatment phase, whereby four of these provide supplementary information on the entire study period (treatment and post-treatment phase). The average drop-out rate is 15.8% (SD=13.4) during the treatment phase and 19.5% (SD=17.7) during the entire trial.</td>
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Global therapy effect of treatment and follow-up within comparison groups
The results of the mean effect during treatment yield medium, but highly significant superior ES_w for the IPT groups compared to both control conditions (Q_B=12.59, DF=2, p<.01, one-tailed) (Table 3). Patients with placebo-attention conditions exhibit small ES_w, which significantly differ from zero. These differ only marginally from those of the groups under standard treatment (Q_B=3.54, DF=1, p<.1). The superiority of the IPT
group is maintained during a post-therapy phase with a mean duration of 8.1 months \((Q_B=8.29, DF=2, p<.05)\).

Table 3

Functional domains

The cognitive domain, together with social behavior and the psychopathological domains, reveals highly significant improvements for the IPT group (Table 3). With reference to the control conditions, only the placebo-attention group shows significant improvement in terms of psychopathology variables. A between-group comparison shows a marked superiority of IPT versus the control conditions – notably with respect to the cognitive domain and social behavior \((Q_B>9.34, DF=2, p<.01)\), but not, however, to the domain of psychopathology \((Q_B=5.74, DF=2, p<.1)\). If the two control conditions are subsumed in this domain, IPT yields significantly higher effects \((Q_B=5.19, DF=1, p<.05)\). The findings pertaining to positive and negative symptoms correspond with the combined psychopathology factor.

Assessment formats

Highly significant improvements are ascribable to IPT in connection with all three assessment formats (Table 3). Moreover, the IPT effects of these three formats are markedly homogenous \((Q_B=0.31, DF=2, NS)\). Expert ratings and those self-ratings which exclusively cover the variables of social behavior and psychopathology, all yield significant findings in the placebo-attention condition as well. Self- and expert ratings accord highly significantly for IPT patients (Spearman’s correlation, two-tailed: \(r=.74, p<.01, K\)-studies=14). Furthermore, the three most utilized assessment instruments – each representing one of the three domains of functioning (Attention-Stress Test, \(d_2\), Brickenkamp 1975; Brief Psychiatric Rating Scale, BPRS, CIPS 1981; the Global Assessment of Functioning Scale, GAF, Sass et al. 1996) – reveal in the mean 44% higher weighted effects for the IPT group than the variables subsumed under the three domains of functioning. Thus, a significant superiority of IPT versus the two control conditions in regard to the BPRS is shown, in contrast to the combined domain of psychopathology \((Q_B=6.62, DF=2, p<.05)\).

Centers

As a means to control and also differentiate possible influences deriving from institutional conditions, treatment settings, or state of illness on the above-mentioned effects, the two control conditions are subsumed owing to the reduced cell size. The effect sizes of IPT and the subsumed control groups are displayed in Table 4.

Table 4

Taken as a whole, all of the academic center studies yield slightly larger effects than non-academic center studies, with regard to IPT and to the control groups. IPT reveals highly significant improvements under both institutional conditions. In academic centers, the control groups also achieve significant improvements during the therapy phase. The four multi-center studies with predominantly non-academic participation have broader variance yield effects, which are, in turn, comparable to the non-academic centers. The differences based on institutional conditions are not significant \((Q_B<1.24, DF=2, NS)\) for
either IPT or the control group.

Treatment setting
The findings of studies using samples of inpatients or outpatients exclusively show highly significant within effects for IPT (Table 4). When contrasted with the control group, the highly significant superiority of IPT is only demonstrated for inpatients (Q_B=9.33, DF=1, p<.01), and the superiority of IPT for outpatients is only marginal (Q_B =3.65, DF=1, p<.1). Although inpatients in the control conditions exhibit significant improvements during the therapy phase, neither IPT nor the control conditions differ with respect to treatment settings (Q_B<0.42, DF=1, NS). During the therapy and catamnestic phases, IPT inpatients reveal higher effects (K=4, follow-up=10 months; ES_w=.79; CI: .43-1.16) than IPT outpatients (K=2, follow-up=7.5 months; ES_w=.44; CI: .07-.80). Whereas outpatients maintain the improvements attained during therapy, after the end of therapy, inpatient effects again improve significantly during the catamnestic phase, in contrast to the actual therapy phase (Q_B =8.46, DF=1, p<.01). Consistent with their state of rehabilitation, at therapy intake, inpatients exhibit a more pronounced pathology as defined by the BPRS (K=12; BPRS-total score: 47.88.7) than outpatients (K=4; BPRS-total score: 40.211.8). Analogous findings can be demonstrated for the five BPRS subscores.

State of illness
IPT shows significant effects for both symptom-stabilized patients and post-acute patients (see Table 4). No significant effects are found for the control group, but post-acute patients show small ES_w, while symptom-stabilized patients show no effects during the therapy phase. At the beginning of therapy, post-acute IPT and control patients exhibit more marked cognitive deficits (D2 standard value [Brickenkamp 1975]: 88.33.5; K=4) than symptom-stabilized patients (D2 standard value:101.721.8; K=5). A significant superiority of IPT when compared to the control group can only be determined for symptom-stabilized patients (Q_B=11.17, DF=1, p<.01). The state of illness has no influence on the efficacy of IPT (Q_B=0.02, DF=1, NS). For the post-therapy phase, statements cannot be made for symptom-stabilized IPT patients owing to a lack of data bases. These patients are able to maintain the effects achieved during therapy on into the post-therapy phase as well (K=6; follow-up=9.7 months; ES=.64, ES_w=.64; ES_w=.53; CI: .29-.77).

IPT subprograms
In each of the studies, IPT is applied in various ways. 11 studies made use of the subprograms "cognitive differentiation", "social perception", and/or "verbal communication" (SP-part I). Five studies only utilize the subprograms "social skills" and "interpersonal problem solving" (SP-part II), while 12 studies employ the entire IPT program (IPT-complete). All three IPT variations show highly significant global therapy effects during the therapy phase (SP-part I: ES=.58; ES_w=.58, CI: .39-.77; SP-part II: ES=.54; ES_w=.52, CI: .26-.78; IPT-complete: ES=.51; ES_w=.46, CI: .32-.61). The medium weighted effects of the three IPT variations are homogeneous (Q_B=0.92, DF=2, NS). With respect to the three domains of functioning, patients receiving SP-part I attain the highest weighted effects in the cognitive domain (K=11; ES=.72; ES_w=.71, CI:.51-.90), and the smallest in the social behavior (K=7; ES=.38; ES_w=.37, CI: .13-.61) when compared to those receiving SP-part II and IPT-complete. A between-group comparison
of the three IPT variations reveals no significant findings with regard to the three domains of functioning (Q_b=4.59, DF=2, NS). To facilitate a comparison of the follow-up results and in view of the small sample size (SP-part I/II), SP-part I and SP-part II are subsumed. An assessment after a post-therapy follow-up averaging 8.3 months for SP-part I/II (K=3) and 7.9 months for IPT-complete (K=5), yields significant improvements for both categories with reference to the baseline. However, the weighted effects of therapy and of the post-therapy phase are 25% higher for IPT-complete (ES=.74; ES_w=.60, CI: .39-.81) than for SP-part I/II (ES=.50; ES_w=.48, CI: .13-.82). No difference can be found in the direct statistical comparison of the two IPT groups (Q_b=0.35, DF=1, NS).

Outcome predictors
The only patient characteristics variable which influence the global therapy effect proved to be duration of illness (Spearman’s correlation, two tailed: r=-.64, p<.01, K=19), and not the age at therapy intake (r=.04, NS, K=26). Neither the duration of therapy (expressed in weeks or hours) nor the frequency of therapy shows any correlation to the global therapy effect (r<.30, NS, K=27). By contrast, a longer therapy duration favorably affects improvement in social competence (r=.47, p<.05, K=19). Within this context, the study carried out by Takai et al. (1993) furnishes an exception, inasmuch as this study yielded small mean effects (ES=.17) in spite of applying only a single weekly therapy session.

The three domains of functioning seem to be interconnected in different ways during the therapy phase. Although improvements in the cognitive domain correlate significantly with improvements in psychopathology (r=.52, p<.05, K=19) and social behavior (r=.51, p<.05, K=15), there are no significant correlations between psychopathology and social behavior (r=.08, NS, K=17). A decline in psychopathology displays a moderate correlation with the self-rating of social behavior (r=.71, NS, K=7).

Moreover, the mean improvements of an aftercare assessment correlate highly significantly with post-therapy improvements (r=.91, P<.01, K=8). Changes in the cognitive domain (r=.89, p<.05, K=6) and in psychopathology (r=.79, p<.05, K=8) during therapy predict mean follow-up effects. Improvements within these two domains also correlate in a significantly negative manner with the drop-out rate (r<-.60, p<.05, K=11).

Effect sizes between comparison groups
In calculating effect sizes (d) between comparison groups, only controlled trials are included (K=21; N=900 patients). Patient characteristics and setting do not differ from those of the total sample (TS) (K=28). The two control conditions are subsumed. In comparison to the control conditions, IPT obtains additional global therapy effects (therapy phase: K=21; d=.40; d_w=.36 CI: .23-.50; therapy and post-therapy phase: K=6, d=.52; d_w=.45; CI: .19-.71) during the course of therapy and the post-therapy phase. The superiority of IPT is also demonstrated in the three domains of functioning (cognitive domain: K=18; d=.46; d_w=.41; CI: .26-.55; social behavior: K=13; d=.34; d_w=.31; CI: .15-.48; psychopathology: K=16; d=.31; d_w=.31; CI: .16-.46). If d_w of the global therapy effect is converted into a correlation coefficient, r=.20 is found. This means that according to Rosenthal’s (1994) Binomial Effect Size Display (BESD), an average of 60% of the IPT patients and 40% of the control patients benefited from the treatment. In order to offset publication bias or, alternatively, the assumption that only studies showing significant findings are usually published, once again as specified by
Rosenthal (1994), calculations were made to the effect that a minimum of 108 IPT studies showing no effect ($Z=0$, $p=.05$) would be needed to negate the positive effects of IPT compared to the control group ($K=21; r=.20, Z=.89$) within this analysis.
Validating the results
The results presented so far include all 28 IPT studies modeled on different designs. To eliminate methodological and design-conditioned bias, in a second step only high quality studies (HQS) which fulfill the following criteria are selected: controlled design of trial, randomized allocation of patients, controlled assessment of medication and explicitly declared blind ratings, or no expert ratings. Seven studies with a total of 362 patients met these criteria. The studies selected do not differ from the total sample (TS, K=28), either in terms of patient characteristics (see Table 2) or therapy setting. Six of these studies recruited inpatients (85.7%) exclusively, and four studies symptom-stabilized patients (57.1%). Four studies included blind ratings, and three studies (42.9%) dispensed with expert ratings. Three of the studies were confined to IPT subprograms for the cognitive domain (SP 1-3), while four studies applied the complete IPT program. Five studies compared IPT with a placebo-attention condition, one study compared IPT to standard care, and one study compared IPT to both control conditions. The weighted medium effect size of IPT and subsumed control groups of the HQS agree with those of the TS (Figure 2).

Figure 2

The global therapy effect of the HQS and the remaining studies of the TS (non-HQS, K=21) do not differ with respect to the IPT group or the control group (Q_b<0.19, DF=1, NS). Accordingly, the findings of the TS and the HQS are homogeneous. The superiority of IPT versus the control conditions is significant for the HQS (Q_b =4.02, DF=1, p<.05), as well as for the TS (Q_b =12.66, DF=1, p<.01). The effects of the HQS across therapy and the catamnestic phase are higher than those of the TS, but are identical with those of the inpatient sub-population in the TS. Once again, the HQS and non-HQS do not differ (Q_b =0.81, DF=1, NS). As with the TS (see Table 3), the IPT patients in the HQS show significant results in all three domains of functioning: cognition (K=6; ES=.52; ES_w=.48, CI: .27-.70), social behavior (K=4; ES=.55; ES_w=.62, CI: .33-.92), and psychopathology (K=5; ES=.50; ES_w=.49, CI: .26-.72). The weighted IPT effects of the HQS are 31.6% higher than those of the TS for follow-up, and 51.2% higher for social behavior, without any significant difference between the HQS and non-HQS (Q_b <2.37, DF=1, NS) being found. With reference to the selection criterion of "blind rating" for the HQS, the expert rating variable is of particular interest. Compared to the TS (see Table 3), no difference pertaining to the subsumed expert rating variable (K=4; ES=.49; ES_w=.52, CI: .35-.60) was found for the IPT group. If this variable is divided into the two domains of functioning, i.e. psychopathology and social behavior, there is no difference found for the domain psychopathology (total population: K=19; ES=.51; ES_w=.45, CI: .33-.58; HQS: K=3; ES=.53; ES_w=.49, CI: .17-.81). By contrast, the HQS display a 38% higher effect of the expert-rated variables of social behavior than the TS (total population: K=17; ES=.43; ES_w=.45, CI: .32-.58; HQS: K=4; ES=.55; ES_w=.62, CI: .33-.92).

The calculation of ES between IPT and the subsumed control conditions in the HQS confirms the results of the TS. Thus, the mean weighted effect during the HQS therapy phases (K=7; d=.37; d_w=.35, CI: .14-.57) is nearly identical with that of the TS (K=21; d=.40; d_w=.36, CI: .23-.50).

Discussion
As had already been demonstrated in earlier reviews (Schüttler et al. 1990), Theilemann & Peter 1994), the efficacy of IPT under controlled randomized conditions could be proved by several primary studies. The present meta-analysis focuses on the effectiveness of IPT under clinical care conditions. As opposed to non-specific group therapy or standard care, IPT yields significantly higher global therapy effects, which are applicable for the therapy phase and are sustained during the follow-up phase as well. At the same time, the direct success of treatment after the end of therapy has proved to be a predictor of high effects at follow-up. When compared to other meta-analyses, the present findings reveal partially controversial results. The follow-up results of the IPT studies accord with the majority of available meta-analyses which describe a maintenance or an increase of the effects during the follow-up phase (Benton & Schroeder 1990, Mojtabai et al. 1998, Gould et al 2001, Rector & Beck 2001). Furthermore, the mean ES of the therapy phase in controlled IPT trials are comparable to the majority of relevant meta-analyses (Benton & Schroeder 1990, Dilk & Bond 1996, Wunderlich et al. 1996, Mojtabai et al. 1998, Krabbendam & Aleman 2003a). These mean ES, however, are smaller than the partially high ES of three meta-analyses of CBT and cognitive remediation (Gould et al. 2000, Rector & Beck 2001, Kurtz et al. 2001). These results and their interpretation are subject to the conditions of content and of the methods deployed. The disparate valued efficacy of various cognitive-behavioral treatment approaches based on a selection of studies and a limitation of the respective selected studies (statistical validity) is discussed controversially in the relevant research literature (cf. Pilling et al. 2002b, Krabbendam & Aleman 2003a,b). In summary, the following methodological influences can be identified, according to which the findings of this meta-analysis should be classified: assessment formats, operationalized variables, functional domains, and psychiatric care conditions.

Assessment formats
As opposed to the results of Mojtabai et al. (1998), but in line with Dilk and Bond (1996), no differences between expert rating and self-rating can be proved. Within the studies included, expert ratings constitute an adequate image of patient self-assessment. Even expert ratings within non-blind design do not seem to distort the results.

Operationalized variables
Generally, cognitive-behavioral approaches yield effects with regard to the "primary outcome", in other words, in those domains which are directly addressed by the interventions (Bustillo et al. 2001). Several IPT studies make reference to accordant empirical evidence (Funke et al. 1989, Garcia et al. 2003). Moreover, the larger effects in the cognitive domain which are yielded by the cognitive SP in contrast to the other IPT variations, indicate the internal validity of these results. A body of controversial findings exists regarding "secondary outcome", that means generalization and transfer of the results. Most notably, variables of generalized social behavior are confounded (e.g. nonspecific aspects of treatment) and are methodologically problematic to operationalize (Bustillo et al. 2001). In accordance with other meta-analyses effects in social behavior tend to be smaller for IPT than for other domains of functioning (cf. Mojtabai et al. 1998, Pilling et al. 2002a,b).

Functional domains
When contrasted with the control conditions, IPT proves clearly superior in every domain
of functioning, whereby the largest effects are obtained in the cognitive domain. In particular, the effects of strategy learning imparted by the first IPT subprogram are consistent with the meta-analytic findings for cognitive remediation approaches (Krabbenbem & Aleman 2003a). In the psychopathological domain, patients without psychotherapeutic treatment gain only moderate effects, attributable to the impact of anti-psychotic drugs. Pharmacotherapy without concomitant psychotherapy does not serve to improve social competence. This factuality is verified by empirical results on social-skills and problem-solving training (Heinssen et al. 2000). If the cognitive IPT subprograms are applied exclusively, the mean effects in social behavior are smaller compared to the additional or alternative application of the social competence subprogram. In addition, a longer duration of therapy would contribute to an improvement in social competence. The results of the aftercare phase accord with the integrated model of mutual impact of the various levels of functioning (Brenner 1986, Green & Nuechterlein 1999). Only those patients participating in the complete IPT, which comprises the treatment components of neurocognition, social cognition and social competence, show an explicit increase of effects during the aftercare phase. In combination with recent studies (Velligan et al. 2000, Liddle 2000, Wykes & van der Gaag 2001, Penades et al. 2003), these results further underpin the assumed generalization of improved neurocognition and social skills to the general level of social functioning.

Psychiatric care conditions
The differential effect of IPT could be demonstrated independent of patient sample, setting or basic conditions. The mean effects of inpatients and outpatients during the therapy phase correspond to findings reported by other meta-analytic studies (Mojtabai et al. 1998, Dilk & Bond 1996). When interpreting the higher effects of inpatients during the aftercare phase, the more pronounced setting-related pathology of this group in comparison to outpatients, must be taken into account. Symptom-stabilized and post-acute patients also display significant improvements under IPT. At the end of therapy, post-acute patients exhibit larger selective attention deficits. This finding is supported by Wykes and van der Gaag’s (2001) aggregation of empirical findings on neurocognitive deficits. The authors conclude that the selective attention of schizophrenia patients reflects episode-dependent cognitive deficits, which also exist during the pre-morbid and remission phases, but are then intensified during an acute psychotic episode. With reference to the remaining patient variables, only duration of illness could be identified as a predictor of success. A longer duration of illness accords with smaller treatment effects. The marginal predictive value of the other patient variables has already been discussed by Mojtabai et al. (1998). In accordance with other studies (Mojtabai et al. 1998, Krabbenbem & Aleman 2003a, Hogarty et al. in press), no influence on treatment effects could be ascribed to the treatment setting. In connection with the postulation put forth by Teusch and Gastpar (2000) to include non-academic institutions active in psychotherapy research, significant IPT effects independent of institution have been revealed. In line with other empirical findings (Mojtabai et al. 1998), the studies carried out at academic centers tend to yield higher effects under IPT and control conditions.

Clinical implications and perspectives for future research

During the 1980s, the frequency of IPT therapy varied between two to five sessions a
week. In recent years, however, a reduced regime of two weekly IPT sessions has become accepted as standard. Taking the requirement of a manual-supported application in preferably homogenous treatment groups structured according to indication (behavior and problem analysis, Roder et al. 2002a), the use of a singly applied or a combination of IPT subprograms in a multimodal treatment approach would appear reasonable, efficient and cost-effective. In cases of heterogeneous groups, non-specific indication, or patients exhibiting deficits on several levels of functioning, only the application of the complete IPT produces sustainable effects. Furthermore, the broad application scope of IPT which renders it suitable for patients in various states of illness and with rehabilitation needs spanning the entire spectrum of psychiatric care, can be instrumental in closing the gap between selective cognitive behavioral interventions and non-specific rehabilitation approaches in standard care for schizophrenia patients.

Critically stated, the findings of the present meta-analysis are subject to limitations of method and content. Consequently, the statistical testing of the studies included has only modest power - a fact that becomes evident when reviewing the results of outpatients and post-acute patients. Hence, further studies with a view to replication are deemed desirable. To date, authoritative statements pertaining to differential indication, which also take the individual courses of rehabilitation, the impact of therapeutic variables, and relapse prevention into consideration, are lacking, not least owing to the available data pool. By reason of the demand for scientifically based psychotherapy (Buchkremer & Klingberg 2001), the coherence of differentiated functional domains during the course of treatment and aftercare - especially in the domains of neurocognition, social cognition and social competence - should be investigated in further controlled trials utilizing adequate sample sizes.