How Generalization Works through the Single Case:
A Simple Idiographic Process Analysis of an Individual Psychotherapy

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Abstract. We demonstrate that there are two alternative trajectories to the same end—generalized knowledge—in the social sciences that operate on two kinds of variability (IAV and IEV). Each of these trajectories maps on different questions of general knowledge construction—at the level of individual cases in contrast with the level of populations. Contrary to the widely accepted assumption that the levels are interchangeable we argue that these need to be kept strictly separate. An illustration of generalized nature of psychotherapy effects based on time-series analysis of one case is provided.

Keywords. Generalization, nomothetic/idiographic contrast, psychotherapy effects.

Each person is unique in all respects—genetically, physiologically, and psychologically. Moreover, each person follows his/her own unique path in life in that (s)he matures, develops, learns, adapts, behaves, and experiences in idiosyncratic ways. Yet, at the same time, within the range of inter-individual and intra-individual (temporal) variability, generic processes of life organization are in operation. It can be said that these generic processes make the high variability possible. As the livelihood of all species depends upon their flexibility of adaptation to ever-unpredictable conditions of the environment, it is not surprising that variability is the “name of the game” in biological and psychological research. [1]

Thus, detailed synchronic, as well as diachronic, structures characterizing each individual person will almost surely never be realized again in this world after it has occurred for the first time. True, similar (but not the same—see Sovran, 1992) forms may be detected—and are meticulously classified into categories by empirical researchers who de facto recognize their intra-category variability (in any case where inter-coder agreement is less than 100%). By forcing a variant of category X into that category by coding it “X” like all other imperfectly fitting specimens eliminates precisely that aspect of the phenomena that psychology needs from further consideration. Psychology’s research traditions have become established so as to disallow their own access to the crucial phenomenon—that of case-specific uniqueness as a representation of generic, universal processes that make this uniqueness possible (Poddiakov & Valsiner, submitted). [2]

Where psychology fails: the nomothetic versus idiographic distinction

The dominant scientific approach in psychology has been labeled nomothetic—as that term is interpreted as the flow of generalization from samples to populations. Roots of that interpretation are partly in the socio-administrative discourse about homogenized social groups such as army recruits, Alzheimer patients, company employees, or N-th grade children. Such discourse treats all members of the class as if they formed a crisp (rather than fuzzy) set, glancing over the obvious intra-class differences as if these are theoretically unimportant. Indeed, when a socially mono-functional role—such as soldier’s—is expected to act as a collective unit, the issue of inter-soldiers differences is socially irrelevant. Yet social irrelevance is not equal to theoretical irrelevance. Psychology has failed to clearly see
that—and its tradition has become to find general laws that hold equally for all subjects in some homogeneous population. Scientific inadequacy of this assumption has been at times noted (Lamiell, 1987, 2003; Molenaar et al, 2003; Valsiner & Sato, in press). [3]

How is the homogenization technically accomplished? This happens by representing the behavior of each subject by the same statistical model (e.g., a linear regression model). Hence, at the level of theoretical assumptions, the researcher operates with the generic single case model (which may be suggested by common sense or everyday language—Valsiner,1986) that is assumed to be testable on empirical data that make use of the quantitative variability between sample members while maintaining the assumption qualitative homogeneity of the “core” (or “hidden”) layer of the issue in question. Only a severely limited degree of heterogeneity between different subjects in such a population can be accommodated (e.g., allowing for subject-dependent regression coefficients in a linear regression model). In such search for nomothetic laws, invariant statistical models are employed that necessarily abstract from the various sources of structural heterogeneity characterizing individual human persons. [4]

Perhaps this strategy satisfies the social uses of psychological data and gains rewards in the form of large epidemiological research grants or journalistic interests, but it adds little to our knowledge of basic psychological functions of particular persons. As soon as the focus is on a particular person P, it becomes important to employ theoretical models—both quantitative and qualitative-- that include all relevant unique aspects of P’s synchronic and diachronic organization (Valsiner, 2004). Furthermore, these models need to include time as a central organizing concept—since any talk of processes implies time. [5]

So, in sum—there are two paths to generalized knowledge—the traditional (mis-labeled nomothetic) that generates knowledge by the sieving of abstract representations from samples to populations, and the idiographic—which emphasizes the time-based variability within each unique case. Behind that uniqueness are basic universal processes that have to be discovered. Hence, we emphasize the new brand of universal science that deals with single, autonomous, context-dependent systems in biology, psychology, sociology, and anthropology. Single cases—analyzed systemically—are the primary empirical objects for arriving at generalized knowledge. [6]

The relevance of idiographic knowledge exists with at least equal force for practice. If P is seeking psychotherapeutic treatment, then P is not so much interested in the general effects of this treatment in some population of homogeneous subjects—who are surely different from P. Instead, P is first and foremost interested in the treatment effects on P’s own individual situation, given the individual life-course history. To answer the latter question, an idiographic approach has to be employed. That approach needs to succeed both at the practical level of treatment in psychotherapy, and at the level of idiographic science as it generates understanding on how psychotherapy works in general. Such a general model is subsequently applicable to new particular cases. In idiographic science, general knowledge is produced by constant abstraction of central features of the systemic function of a concrete case to its abstract model, with subsequent testing of the model on further particular cases. [7]

**The idiographic general model**

To capture the manifold sources of uniqueness characterizing persons in a scientifically fruitful way, each single person’s life is idiographically conceived of as the evolution of a
high-dimensional dynamic system in time. The component processes making up this dynamic system ideally consist of all possible repeated measurements (physiological, behavioral, etc.) that can scientifically be obtained with the person. Let the high-dimensional time series of measurements characterizing person P be denoted by $y_P(t)$, where $t$ denotes time. Then a schematic outline of the idiographic statistical model for P is:

(1) $y_P(t) = F_P[x_P(t), \varepsilon_P(t), t]$

In this general model, the time-dependent evolution of $y_P(t)$ is explained by a (time-varying) person-specific function $F_P[., ., t]$ depending on (time-varying) independent variables $x_P(t)$ and residual influences $\varepsilon_P(t)$. The details of this model do not matter; suffice it to note that (1) includes as special cases all known statistical techniques such as analysis-of-variance, regression, factor analysis, etc. What matters, however, is that the function $F_P[., ., t]$ explaining P’s evolution in time is person-specific. The function $F_P[., ., t]$ is known in the engineering sciences as the system function. Hence the essence of the idiographic model scheme (1) is that the system function characterizing person P, $F_P[., ., t]$, may differ in arbitrary ways from the analogous system function $F_Q[., ., t]$ characterizing another person Q.

In contrast to the idiographic model scheme (1) involving system functions specific for each person, the analogous nomothetic model scheme essentially involves a system function that is invariant across a population of homogeneous persons $i=1, 2, \ldots$:

(2) $y_i(t) = F[x_i(t), \varepsilon_i(t), t] ; i=1, 2, \ldots$

Notice that in the nomothetic model scheme (2) the system function $F[., ., t]$ lacks any dependence upon the person-index $i$ and hence this system function is assumed to be invariant across the persons named $i=1, 2, \ldots$ in some homogeneous (sub-)population. Again, the details of the nomothetic model scheme (2) do not matter; it includes all known statistical techniques such as analysis-of-variance, regression analysis, factor analysis, mixed modeling, etc. What matters, however, is that the system function $F[., ., t]$ characterizing each person $i$ belonging to some population of interest is invariant for all arbitrarily chosen different persons $P (i=P)$ and $Q (i=Q)$.

The dynamic systems interpretation of persons implied by the idiographic model scheme (1) is very abstract and quite indefinite without further specification. But it has the immediate merit that it leads to principled ways to study the unique aspects of a person, namely by focusing on the dynamical structure of repeated measurements obtained with this particular person (cf. De Groot, 1954). For instance, to study the effects of psychotherapeutic treatment on a given individual person P, one has to focus on the relevant ways in which P’s life path, $y_P(t)$ in (1), changes as function of the sequence of therapeutic sessions. This idiographic approach involves a combination of the case study method (e.g., Scholz & Tietje, 2002) and statistical time series analysis.

**Two kinds of variation: IAV and IEV**

The necessity to use time series analysis of IntrA-individual Variation (IAV) in order to arrive at valid results concerning individual assessment, prediction, and control of single subjects has been shown in a number of publications (e.g., Molenaar et al., 2003; Molenaar, 2004). IAV pertains to the time-dependent variation within a given person P, hence it concerns the structure of variation of $y_P(t)$ in the idiographic model scheme (1). In contrast,
the currently popular nomothetic approaches to psychological and psychometric research, based on IntEr-individual Variation (IEV), have been shown to be invalid for the purpose of applications at the level of individual persons. IEV pertains to the variation between persons I in a given population, hence it concerns the structure of variation of $y_i(t)$ in the nomothetic model scheme (2). [11]

To illustrate the fundamental difference between IAV and IEV, we will consider the distinct ways in which the covariance matrix of the observations is determined under the idiographic model (1) and the nomothetic model (2), respectively. The covariance matrix is a standard statistic in applied analyses of the structure of variation (e.g., in factor analysis, hierarchical modeling, etc.). Given an observed time series $y_p(t)$, $t=1,2,\ldots,T$, where $T$ is the number of repeated observations obtained with person $P$, the idiographic covariance is estimated by:

$${\bf C}_P(y) = T^{-1} \sum_{t=1}^{T} y_P(t) y_P(t)'$$

where $y_P(t)'$ denotes the transpose of $y_P(t)$. Hence the idiographic covariance matrix (3) is estimated by the cross-products $y_P(t)y_P(t)'$, summed over the measurement occasions $t=1,2,\ldots,T$ (denoted by $\Sigma_{t=1,\ldots,T}$). $C_P(y)$ is a measure of intra-individual variation (IAV). In contrast, given observations $y_i(t)$ for a sample of persons $i=1,2,\ldots,N$ randomly drawn from some homogeneous population, the nomothetic covariance according to (2) is estimated by:

$${\bf C}_Y = N^{-1} \sum_{i=1}^{N} y_i(t) y_i(t)'$$

Hence the nomothetic covariance (4) is estimated by the cross-products $y_i(t)y_i(t)'$, summed over the persons $i=1,2,\ldots,N$ (denoted by $\Sigma_{i=1,\ldots,N}$). $C_Y$ is a measure of inter-individual variation (IEV). [12]

At this point, we have to address an important caveat. A common misunderstanding in the published psychometrical literature concerns the relationship between genuine time series analysis of IAV according to the idiographic model scheme (1) and longitudinal analyses (whether trend analysis, latent growth curve analysis, longitudinal factor analysis, or otherwise). All longitudinal analyses are instances of the nomothetic model scheme (2), and hence (neglecting inessential technical details) the longitudinal covariance matrix is computed according to (4), i.e., by pooling across different persons $i=1,2,\ldots,N$. Consequently, all possible variants of longitudinal analysis are based on, and pertain to, analyses of the structure of IEV, not IAV. [13]

The difference between the idiographic model scheme (1) in combination with (3) on the one hand, and the nomothetic model scheme (2) in combination with (4) on the other hand, can now be clearly stated. The idiographic scheme (1) pertains to the time-dependent variation (IAV) within a given single person $P$, the structure of which is explained by a $P$-specific system function $F_p[\ldots,t]$, i.e., a system function that may differ arbitrarily between different persons $P$ and $Q$. In this way, the uniqueness of each person is optimally accommodated in the statistical analysis. In contrast, the nomothetic scheme (2) pertains to the variation (IAV) between different persons $i=1,2,\ldots$, the structure of which is explained by a common system function $F[\ldots,t]$ that is assumed to be invariant across different persons in the population. Obviously, this assumption of an invariant system function leads to a statistical analysis that neglects the uniqueness of each person in the population. [14]

The nomothetic model scheme (2) is very dominant in current psychology. For instance, the standard test theory (cf. Lord & Novick, 1968), according to which almost all psychological
tests are constructed, normed, and validated, is based on analysis of IEV by means of the nomothetic model scheme (2). However, a psychological test thus obtained is often applied subsequently in individual counseling, assessment, and prediction. Stated abstractly, one then uses the system function $F[\ldots,t]$ in the nomothetic model (2) and applies it to explain the IAV structure of variation of a single person P. However, the true system function of this person P is $F_P[\ldots,t]$. It can be straightforwardly deduced from general mathematical-statistical theorems (the so-called classical ergodic theorems; cf. Molenaar, 2004) that in general $F_P[\ldots,t] \neq F[\ldots,t]$! In fact, the system function $F_P[\ldots,t]$ characterizing a given person P seeking psychological advice may differ in arbitrary ways from the nomothetic system function $F[\ldots,t]$ characterizing the population to which P belongs. From this it follows immediately that, in order to obtain valid assessments and predictions for a given person P, one needs to know P’s system function $F_P[\ldots,t]$. The classical ergodic theorems imply that the true person-specific system-function characterizing P (or any other individual person) can only be validly estimated in time series analysis of P’s IAV. Generalization of the nomothetic system function $F[\ldots,t]$ to the individual case of person P (i.e., substitution of $F[\ldots,t]$ for $F_P[\ldots,t]$) is not warranted by the ergodic theorems. [15]

Time series analysis

Modern multivariate time series analysis involves a highly developed group of advanced paradigms, including special statistical techniques to analyze nonlinear dynamical processes undergoing stage transitions (e.g., Molenaar & Newell, 2003). In most psychology departments, these time series analysis techniques are not taught in regular methodology courses, and therefore will be unknown to most of our colleagues. Yet the idiographic approach necessarily requires the use of these time series analysis techniques in order to arrive at valid results at the level of individual persons, and therefore may not be accessible to researchers that lack this technical knowledge. [16]

In order to try to overcome this impasse, we report the results of a genuinely idiographic study of the effects of a psychotherapy with a single child C in which only the most simple statistical tools are used. The statistical tools that we use should be immediately transparent because they are based on straightforward heuristic reasoning. The results thus obtained will be seen to be of considerable importance, despite the simplicity of the employed statistical tools, and therefore constitute an illustration of the power of the idiographic approach. [17]

The empirical case: Effects of individual psychotherapy

The psychotherapy concerned a young child C (boy; 5 years) who had typical problems associated with continued bed-wetting. The female therapist T successfully applied client-centered therapy (e.g., Axline, 1969) in a sequence of thirty-nine sessions, two sessions each week. In total, twenty-nine sessions were videotaped and subsequently scored. No videotapes are available of sessions 1, 8, 11, 12, 13, 14, 24, 27, 32 and 34. Each videotaped session was divided into an initial part, a middle part, and an end part. An independent researcher (Alice Grannetia) observed the relevant parts of each videotaped session (e.g., initial part) and then rated the observed behavior of C and T in terms of a slightly adapted version of Bales’ Symlog scale (Bales & Cohen, 1979). This scale has been specifically constructed to assess behavior in small groups and has as additional asset that it is neutral with respect to theoretical psychotherapeutic interpretations (client-centered or otherwise). Inter-rater reliability was assessed to be satisfactory (cf. Grannetia, 1984). The 24 items of our version of Symlog are presented in Appendix A. To illustrate, the first item of Symlog is: “Active, takes initiative” and is scored with the categories “never” labeled 0, “rarely”
labeled 1, “sometimes” labeled 2, and “often” labeled 3. [18]

**Raw data**

Each item of Symlog is scored for the videotaped behavior of C as well as T in each part (initial, middle, end) of each videotaped session. This yields 24 (items) times 3 (parts) times 2 (C or T) univariate categorical time series of length 39 (sessions). Each univariate series in this set will be denoted by first indicating the actor (C or T), then the item number of Symlog (1-24), and lastly the code for the part of the sessions (initial = 1, middle = 2, final = 3). For instance, C1,3 denotes the time series of ratings for C on the first Symlog item (Active, takes initiative) during the final part (code = 3) of each session. This raw data set is presented in Appendix B (missing value code is 9). [19]

Notice that a number of observed univariate time series for C as well as for T shows no, or insufficient, variation across the sessions. For instance, for C the series associated with Symlog items 4 (Controls in demanding ways), 5 (Domineering, unfriendly), and 19 (Tries too hard) are uninformative for their initial, middle, as well as final parts. For T the uninformative series include the initial, middle, and final parts of Symlog items 4 (Controls in demanding ways), 5 (Domineering, unfriendly), 6 (Provocative, egocentric, shows off), 7 (Emotional, expressive, dramatic), 12 (Negativistic), 13 (Irritable, won’t cooperate), 18 (Adapts because of (dis-)approval), 19 (Tries too hard), 20 (Resentful), 21 (Withdraws), 22 (Afraid to try, doubts own ability), and 23 (Friendly asks for support and attention). [20]

**Predictions**

The goals of a client-centered psychotherapy can be summarized as follows: a) To increase the client’s self-reliance, b) To increase the client’s openness, and c) To restructure the client’s self-image. For reasons of conciseness, we do not present a complete analysis of these goals, but will restrict attention to the first goal. More specifically, it is predicted that C will show increased self-reliance across the 39 sessions of this successful psychotherapy. [21]

The next important step is to operationalize the theoretical variable self-reliance (S-R) in terms of the observed Symlog ratings. This can be accomplished in various ways. We base the following operationalization of self-reliance on the theoretical discussion of client-centered psychotherapy given in Grannetia (1984): S-R for C consists of the sum of ratings on Symlog items 1 (Active, takes initiative), 3 (Determines course of events), 11 (Task-oriented), 16 (Trustful), 17 (Accepts directions cooperatively), 18* (Adapts because of (dis-)approval), 22* (Afraid to try, doubts own ability), and 23* (Friendly asks for support and attention). The starred Symlog items (18*, 22*, 23*) concern ratings that are inversely related to S-R in that they will decrease with increasing self-reliance. Hence the ratings on these starred items are reversed before adding to the total (never = 3, rarely = 2, sometimes = 1, often = 0). Self-reliance for T is defined as for C, but without Symlog items 18*, 22*, and 23*. Hence for T, S-R is defined as the sum of Symlog items 1, 3, 11, 16 and 17. [22]

**Statistical analysis**

To start with, we will investigate whether the univariate categorical time series of C’s scores on the Symlog items defining self-reliance (S-R) show substantial trends across the sessions of the psychotherapy. To illustrate the details of the approach, consider C1,3, the univariate
categorical series of ratings for C on the first Symlog item (Active, takes initiative) during the final part of each session. The observed C1,3 series is shown in Figure 1. [23]

Figure 1

![Categorical series of ratings](image)

Although the C1,3 series will be autocorrelated (i.e., sequentially dependent) between consecutive sessions, we decide to neglect this in the first instance because of the presence of several missing sessions dispersed throughout the observation period. Autocorrelation is an inverse function of the temporal distance between consecutive measurements and the presence of several missing sessions increases this temporal distance, hence decreases the effective autocorrelation present in the actual observations. Moreover, the limited number of repeated observations actually made (29 sessions) would not seem to warrant the use of more sophisticated statistical models accommodating the presence of autocorrelation. [24]

To determine whether the C1,3 series shows the expected upward trend across sessions (i.e., C’s ratings on the first Symlog item during the final parts of sessions are expected to increase during psychotherapy), this series is divided into two stretches: an initial stretch and a final stretch. The initial stretch starts at session 1 and ends at sessions n, while the final stretch starts at session n+1 and ends at session 39. The session n that divides the complete observed series into two stretches is not fixed a priori but is determined by means of a simple search procedure (a sequence of statistical analyses is carried out while stepwise varying n between n=15 and n=23). [25]

The likelihood ratio statistics associated with each (2 x 2)-table obtained by stepwise varying the cutting point n between sessions n=15 and n=23 are determined. Next, the session value yielding the maximum likelihood ratio statistic is selected. If this value has a small nominal probability of occurrence under the hypothesis that there is no trend in the C1,3 series (smaller than Prob = .05), then this is interpreted as indicative of the presence of a trend in this series. [26]

**Results univariate trend analyses for child C**

The test procedure described for the C1,3 series has been carried out for all Symlog items that belong to the operationalization of Self-Reliance (S-R) of the child C. The operationalization of S-R for C (repeated here for the convenience of the reader) involves the Symlog items 1 (Active, takes initiative), 3 (Determines course of events), 11 (Task-oriented), 16 (Trustful), 17 (Accepts directions cooperatively), 18* (Adapts because of (dis-)approval), 22* (Afraid to try, doubts own ability), and 23* (Friendly asks for support and attention). The starred Symlog items (18*, 22*, 23*) concern ratings that are inversely related to S-R in that they will decrease with increasing self-reliance. Hence the ratings on these starred items are reversed before adding to the total (never = 3, rarely = 2, sometimes = 1, often = 0). [27]
The following results are obtained (reporting only those series the likelihood ratio statistic of which has probability of occurrence under the hypothesis of no trend smaller than $p = .05$).

<table>
<thead>
<tr>
<th>Series</th>
<th>Description</th>
<th>Prob</th>
</tr>
</thead>
<tbody>
<tr>
<td>C1,3</td>
<td>Active, takes initiative; final part sessions</td>
<td>.035</td>
</tr>
<tr>
<td>C11,3</td>
<td>Task-oriented; final part sessions</td>
<td>.040</td>
</tr>
<tr>
<td>C16,3</td>
<td>Trustful; final part sessions</td>
<td>.028</td>
</tr>
<tr>
<td>C18*,1</td>
<td>Adapts due to (dis-)approval; initial part sessions</td>
<td>.020</td>
</tr>
<tr>
<td>C18*,2</td>
<td>Adapts due to (dis-)approval; middle part sessions</td>
<td>.016</td>
</tr>
<tr>
<td>C18*,3</td>
<td>Adapts due to (dis-)approval; final part sessions</td>
<td>.012</td>
</tr>
<tr>
<td>C22*,1</td>
<td>Afraid to try; initial part sessions</td>
<td>.013</td>
</tr>
</tbody>
</table>

It appears that especially in the initial and final parts of sessions, the rating scores of C on the Symlog items making up our operationalization of self-reliance (S-R) change in the expected directions during psychotherapy. It appears that the initial and the final parts of each session allow for a more free expression of C’s condition, whereas the middle part of each session is more structured according to treatment demands. This interpretation would imply that the therapist T’s behavior during the middle, more treatment-determined part of each session will be most effective in realizing these changes in C. To further test this interpretation, we carry out a simple causal analysis linking T’s self-reliance scores during the middle part of each session to C’s self-reliance during the initial and final parts of each session. [28]

**Different forms of causal analyses**

There exist various models of causality (Valsiner, 2000). Our causal analysis here is based upon a straightforward heuristic principle of physical (direct linear) causality: The realization of a cause has to precede in time the realization of its effect(s). First, the stone is being thrown, then after some interval of time the window glass is breaking. In terms of our dynamic systems point of view, a process $x(t)$ is causally related to a process $y(t)$ in case changes in the activity (magnitude) of $x(t)$ systematically precede in time changes in the activity of $y(t)$, but not the other way around. Hence if $x(t)$ is indeed causally related to $y(t)$, then the correlation between the activity of the cause at time $t$, $x(t)$, and the activity of the effect at the next time $t+1$, $y(t+1)$, should be high. That is, $\text{cor}[x(t), y(t+1)]$ should be high. However, importantly, the reverse correlation between the activity of the effect at time $t$, $y(t)$, and the activity of the cause at the next time $t+1$, should be negligible. That is, $\text{cor}[y(t), x(t+1)]$ should be negligible. If this pattern of lagged cross-correlations occurs between two (sets of) time series, then they are prime candidates for being causally related. [29]

Our candidate dependent process is C’s self-reliance (S-R) score, i.e., the sum of C’s rating scores for Symlog items 1, 3, 11, 16, 17, 18*, 22*, 23*, adding over both the initial and the final parts of each session. Our candidate causal process is T’s S-R score, i.e., the sum of T’s rating scores for Symlog items 1, 3, 11, 16, 17, only in the middle part of each session. Thus defined, let $C(t)$ denote the time series of C’s S-R scores across sessions $t=1, \ldots, 39$. Thus defined also, let $T(t)$ denote the time series of T’s S-R scores across sessions. $C(t)$ is depicted in Figure 2a; $T(t)$ in Figure 2b. [30]
We now estimate the following three cross-correlations:

\[
\text{Cor}[T(t), C(t+1)] = .367 \\
\text{Cor}[T(t), C(t)] = .277 \\
\text{Cor}[C(t), T(t+1)] = -.290
\]

In case changes in T’s self-reliance indeed are causally related to changes in C’s self-reliance, then the first cross-correlation, Cor[T(t), C(t+1)], should be high or at least the highest of the reported cross-correlations. The second, inverse prediction deduced from the same causal hypothesis is that the third correlation, Cor[C(t), T(t+1)], should be negligible. It is negative, perhaps not negligible. Finally, the instantaneous correlation Cor[T(t), C(t)] in this causal analysis has a more indefinite status which does not require further discussion. [31]

We conclude, on the basis of the simple causal analysis reported above, that it yields very suggestive evidence for the presence of a repetitive “pushing role” of the psychotherapist’s self-reliance expressed in the middle, treatment-regimented part of each session and the child’s self-reliance expressed in the more casual initial and final parts of each following session. This is a noteworthy result, which might be interpreted as indicative of the importance of the therapist as implicit role model. The finding is strong-- made possible by our simple idiographic approach. [32]

Of course, statistical results need interpretation. With respect to the evidence concerning relevant trends in the component series making up the C(t) series, it is plausible to expect that these significant changes were at least partly caused by T’s implicit role modeling. The
important finding here is the continuity of the pattern of such effect from session to session, as our idiographic analysis reveals. [33]

Discussion and conclusion

In the theoretical part of this paper we showed the necessity to use idiographic approaches in psychology, after which an empirical idiographic process analysis of psychotherapy was presented as illustration. In this closing section the discussion will proceed in reverse order. [34]

We first discuss our empirical idiographic psychotherapeutic process analysis. The client-centered psychotherapy with the child was, according to the child, its parents as well as the therapist, concluded successfully after 39 sessions. It is found with simple statistical tests that many of the univariate Symlog item scores making up the operationalization of Self-Reliance (S-R) for the child show substantial trends in the direction predicted by the theory of client-centered psychotherapy. This in itself is a noteworthy result, corroborating the theory concerned. The likelihood ratio statistics used in the trend analyses are based on the assumption that the data lack sequential dependencies. Although this is not the case with the univariate categorical time series making up the operationalization of C’s S-R, it is expected that the amount of sequential dependencies actually present (autocorrelation) will be negligible because of the presence of missing values (gaps) in each series. Exact probabilities associated with the likelihood ratio statistics can be obtained by means of standard computer-intensive (Monte Carlo) testing methods. [35]

In addition to the univariate trend analyses, a simple causal analysis has been carried out based on the rationale underlying the so-called Granger causality test popular in econometric time series analysis (Lutkepohl, 1991). This rationale derives from the physical interpretation of cause as necessarily preceding in time the effect. It implies that variation in the therapist scores at each time t (the cause) should be associated highest with the child scores at each following time t+1 (the effect). It also implies that variation in the child scores at each time t (the effect) should not be associated with the therapist scores at each following time t+1 (the cause). This causal pattern of lagged cross-correlations is found for the therapist characteristic “Self-Reliance during the middle part of therapy sessions” as cause and the child characteristic “Self-Reliance during the initial and closing parts of therapy sessions” as effect. The lagged cross-correlations between these two behavioral dimensions shows the expected pattern compatible with “therapist S-R during middle part” in each session being the cause of variation in “child S-R during initial and final parts” in each next session. Again, this is a noteworthy result in that it tentatively identifies a causal effective ingredient of the ongoing psychotherapeutic process. [36]

Let T(t), t=1,2,…,39, denote the time series of therapist S-R scores during the middle part of sessions, and let C(t), t=1,2,…,39, denote the child S-R scores during the initial and final parts of sessions. Then the Granger causality test boils down to a comparison of Cor{T(t), C(t+1)} = .367 (which should be high) and Cor{C(t), T(t+1)} = -.290 (which should be negligible). Formal statistical tests of this comparison require the availability of standard errors, which in the present application have not been determined. Given the small number of repeated observations and the presence of missing values, the latter could be best obtained by means of computer-intensive Monte Carlo methods. [37]

Our idiographic process analysis of a successful client-centered psychotherapy with a young child provides noteworthy evidence that the child changes in the predicted direction along the important theoretical behavioral dimension called Self-Reliance. This expected trend
occurs in many of the Symlog item scores operationalizing S-R for the child. Moreover, noteworthy evidence is found for the causal effectiveness of T(t), i.e., the therapist’s S-R during the middle (“working”) part of sessions, in creating changes in C(t), i.e., the child’s S-R during the initial and final (“free”) parts of sessions. These results only pertain to the particular child C figuring in this idiographic process analysis. For instance, they could be used in eventual subsequent treatments of this child (e.g., optimal behavioral control; cf. Molenaar, 1987). However, the tentative finding about the causal role of therapist Self-Reliance in effecting changes in this child’s Self-Reliance immediately suggests itself as a working hypothesis in replications of this idiographic process analysis with other children. In this way, a systematic empirical cycle can be initiated in which homogeneous sets of children are identified who all share the same structure (e.g., the same system function) of intra-individual variation (IAV). In short, this would constitute one possible variant of the scientific search for nomothetic laws about idiographic structures of variation (cf. Nesselroade & Molenaar, 1999, for an alternative approach to nomothetic generalization in idiographic designs). [38]

In principle, the idiographic approach applies to the whole of psychological science. The idiographic process analysis of a client-centered therapy can straightforwardly be generalized to other kinds of psychotherapy (behavioral, psycho-analytical, etc.). Modern theories of personality such as those of Block (2002), Mischel (1999), and Carver & Scheier (1998), lend themselves excellently to modeling and analyzing according to the idiographic scheme (1). Hence these modern personality theories can provide additional support in the search for nomothetic generalizations of idiographic psychotherapeutic structures (cf. also Caprara & Cervone, 2000). [39]

The necessity to employ idiographic paradigms in psychology derives directly from the classical ergodic theorems (and hence cannot be refuted). Idiographic process analysis requires the use of time series analysis techniques, an approach that is relatively unknown in psychology. In our empirical illustration we tried to show how idiographic process analysis can be carried out with simple statistical means and how the results thus obtained lend themselves to nomothetic generalization. This is a task that has to be undertaken for the whole of scientific psychology. [40]

References


Valsiner, J. (1986). Between groups and individuals: Psychologists' and laypersons’ interpretations of correlational findings. In J. Valsiner (Ed.), The individual subject and scientific psychology (pp. 113-152). New York: Plenum.


Appendix A: Adapted version of Symlog

1 : Active, takes initiative
2 : Initiates positive behavior
3 : Determines course of events
4 : Controls in demanding ways
5 : Domineering, unfriendly
6 : Provocative, egocentric, shows off
7 : Emotional, expressive, dramatic
8 : Entertaining, sociable, warm
9 : Friendly, interested
10: Works cooperatively with other
11: Task-oriented
12: Negativistic
13: Irritable, won’t cooperate
14: Shows feelings and emotions
15: Shows affectionate feelings towards other
16: Trustful, looks up to other
17: Accepts directions cooperatively
18: Adapts because of (dis-)approval
19: Tries too hard
20: Resentful
21: Withdraws
22: Afraid to try, doubts own ability
23: Friendly asks for support and attention
24: Passive