Original Papers

Polish Psychological Bulletin
2019, vol. 50(2) 207–216
DOI - 10.24425/ppb.2019.129453

Tomasz Korulczyk[*]
Adam Biela[*]
Neville Blampied[**]

Being more idiographic in the nomothetic world

Abstract: *Since psychology emerged as an independent field of knowledge, there has been no consensus as to how it should develop, either, in the idiographic or nomothetic way. In the course of time, due to a commitment to what was seen as objectivity in science, the nomothetic approach came to dominate psychology. Thus, researchers used mostly quantitative psychometric methods to establish general rules of human behaviour. In doing so, the essence of nomothetic research is to be extremely careful when interpreting results not to make a reasoning mistake such as the ecological fallacy, as may happen when a researcher draws conclusions about nature of the individual in the group based on average results of the whole group. In the article, we presented two methods for longitudinal research designs which address this problem, and give more idiographic information about participants; via the Reliable Change Index and the Modified Brinley Plot. Finally, we provide a IBM SPSS Statistics syntax automatizing the whole process of computation for these new features.*

Keywords: *longitudinal research, Modified Brinley Plot, Reliable Change Index, idiographic approach, IBM SPSS Statistics*

In May 1894, on the occasion of his induction as Rector of the University of Strasburg, the Kantian philosopher Wilhelm Windelband (1848–1915) introduced two terms into discourse about science by which he differentiated two separate aspects of the empirical sciences (*die Erfahrungswissenchaften*): *The one comprises sciences of law, the other sciences of events; the former teaches what always is, the latter what once was. … it can be said that scientific thought is in the one case nomothetic, in the other idiographic*[1] (Windelband, 1990/1998, p. 13). These terms (nomothetic, idiographic) were subsequently introduced into Psychology by the personality theorist Gordon Allport (1937), thus engendering an enduring controversy and considerable misunderstanding and misinterpretation (Lamiell, 1998) in the discipline.

An idiographic method focuses on individual cases or events. Ethnographers, for example, observe the minute details of everyday life to construct an overall portrait of a specific group of people or community. A nomothetic method, on the other hand, seeks to produce general statements that account for larger social patterns, which form the context of single events, individual behaviours, and experience. Sociologists who practice nomothetic research are likely to work with large survey data sets or other forms of statistical data, and to conduct quantitative statistical analysis as their method of study (Crossman, 2019).

Within this, at times acrimonious, debate positions have been taken and viewpoints espoused which have forced psychologists into seeing idiographic and nomothetic approaches to knowledge as dichotomies or antitheses; positions which reflect neither Windelband nor Allport's intentions (Lamiell, 1998). The tenor of this debate in the years immediately after Alport's introduction of the terms in 1937 is captured by Skaggs (1945) who declaimed *…the knowledge of psychology must be classified into two groups, nomothetic and idiographic.* ***The nomothetic class is scientific***. (Skaggs, 1945, p. 238, emphasis added).

Skaggs' conclusion – that only the nomothetic approach is scientific – become the dominant viewpoint of

[1] Occasionally one may found the "idiographic" spelled "ideographic" in the literature, which is not exactly the same. Ideographic relates to written symbolic representations.

[*] The John Paul II Catholic University of Lublin
[**] The University of Canterbury

Corresponding author: Tomasz Korulczyk, e-mail: tomasz.korulczyk@gmail.com

Western psychology throughout the 20th Century (Danziger, 1990), and remains a widely held view today. It proclaims that psychology, to be scientific, should be conducted in a way which leads to a focus on the abstract, the general rather than the particular, the timeless, the average or typical, and the impersonal, for the aim of establishing general rules (even conceptualized as laws) about human functioning (Cattell, 1946; Eysenck, 1952; 1966; 1981). This has been the dominant ideal within many fields of psychology, including methodological behaviourism, behavioural neuroscience, psychophysiology, social psychology, and cognitive psychology (to name just a few areas); and it is particularly evident in experimental psychology where the belief is the core phenomena of psychology are cognitive in nature (Hergenhahn & Henley, 2014). The nomothetic point of view has even come to dominate personality psychology, contra Alport's intentions (Lamiell, 1998). All these domains of research are directed at formulating general theories about humans, their conduct and relationships. Furthermore, the nomothetic idea has become inextricably linked to the quantitative methods of psychology (Cronbach, 1957; Danziger, 1990) and to the use of statistical inference procedures derived from the work, between 1925 and 1935, of the agricultural statistician and geneticist, R.A. (Sir Ronald) Fisher (see Blampied, 2013; Meehl, 1978; Nickerson, 2000; Wright, 2009). This orthodox nomothetic approach requires the use of methods and study designs which allow the drawing of general conclusions from samples which then may be generalised to some population. The simplest example is the statistical average of a sample. It includes both cross-sectional and repeated-measures/longitudinal designs, mainly using quantitative experimental, quasi-experimental and correlational approaches and formal psychometric measures.

On the other hand, the idiographic approach, although much disparaged (e.g., Skags, 1945), has persisted as a minority position. Adherents focus on the experiences, thoughts, and feelings of individual people as historically and contextually situated one-of-a-kind events, and therefore unique, unrepeatable, and often qualitative rather than quantitative (Allport, 1935; 1937; Danziger, 1990; Rogers, 1947). In this ideal advocated by Allport, the purpose of psychological science is to describe the phenomena of the individual human mind in order to understand it more deeply, which in turn makes it quite impossible (or at least, premature) to establish any general rules, laws, or theories concerning human behaviour in general (Hergenhahn & Henley, 2014). Such idiographic research is generally undertaken within a qualitative paradigm (Silverman, 2011), involving case studies, unstructured observations, formal and informal interviews and other related methods (e.g., Allport, 1937; Danziger, 1990; Silverman, 2011).

The idiographic perspective also is often found in applied research and professional work, where researchers and practitioners aim more towards practical and applied purposes and when their primary objective is finding ways to help an individual case – a person, class, team, group, organization or community (Valsiner, 1986) – change or improve their circumstances or performance. This embraces the truth of Allport's observation that *the application of knowledge is always to the single case* (Allport, 1942, p. 58).

This history of dispute and division notwithstanding, there has been growing recognition in recent times that both nomothetic and idiographic approaches to psychology as a science are possible and are complementary to each other (e.g., Silverstein, 1988; Streiner, 2004) and may be properly, and usefully combined, a position entirely congruent with Windelband's original statement. He wrote ... *all value determinations of the human being are based on the particular and unique. …On the other hand, the idiographic sciences require, at every step, general theses ... [taken] only from the nomothetic disciplines*. (Windelband, 1900/1998, pp. 18–19). Scholars from a variety of perspectives and areas within psychology who have advocated this position include clinical psychologists (e.g., Barlow & Nock, 2009; Beltz, Wright, Sprague, & Molenaar, 2016; Busch, Wagener, Gregor, Ring, & Borrelli, 2011), cognitive psychologists (e.g., Hommel & Colzato, 2017), school/educational psychologists (e.g., Petscher, 2016), personality theorists (e.g., Lamiell, 2009; Molenaar & Campbell, 2009; Nesselroade, 2010) and methodologists (e.g., Blampied, 2017a; Grice, 2011, 2015; Speelman & McGann, 2016; Trafimow, 2014). This article is a contribution to this development. First, we describe some limitations of drawing the conclusion from research designs based solely on the nomothetic model. Second, we argue that, even within the nomothetic model researchers may take steps to be more idiographic and, if our recommendations are pursued, researchers may be able to better capture individuals' behaviour in context. Then, to assist researchers to achieve this outcome we show it is possible to track changes at the single individual level in any repeated-measures/longitudinal design using the analysis of reliable change and a form of graph called a modified Brinley Plot (Blampied, 2017a; Jacobson & Truax, 1991). And, we present useful SPSS syntax automatizing whole calculation and graphing process for tracking individual change.

Problems with the nomothetic research paradigm

Given the dominance of the nomothetic viewpoint in psychology, one can well ask how should we attempt to be more idiographic? Why not stick to the traditional way of thinking and researching? One justification for trying to be more idiographic in research (Barlow & Nock, 2009) comes from an awareness of limitations of the nomothetic perspective. To this end, we present some discussion of these methodological issues.

Note, first, that the way we conventionally achieve the main goal of the nomothetic approach – obtaining a statement in general form about a property of a psychological phenomenon – is deficient. A standard approach to experimental design (Wilkinson & the Task Force on Statistical Inference, 1999) is to assign participants contemporaneously to groups (thought of as samples from some population), one (or more) of which receives a treatment while the other remains untreated and exposed only to inert factors (called the control group). Quantitative data from measurements of the participants in each group are then used to compute a measure of central tendency in the form of group means. The statistical significance, direction and strength of between-group difference are determined by the use of some method of statistical analysis based on null-hypothesis statistical tests (NHST), and if the mean difference is larger than some statistical probability criterion, the average between-group difference is said to be "significant" and therefore worthy of further interpretation. In the next step, the researcher interprets the results by comparing the performance of one group relative to that of another (e.g., comparing the treatment group mean against the control group mean).

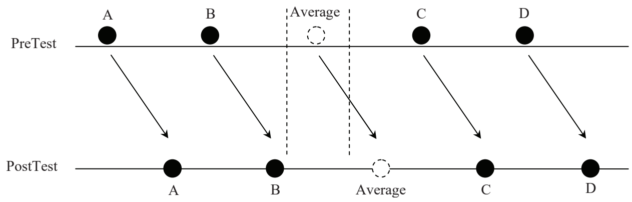
At this point, it is easy to overdraw conclusions when lacking awareness of the constraints of the data analysis and inference model being employed. Because the search is for abstract generalities rather than individual attributes, there is a bias to concluding that all/most of the treatment group participants responded to the treatment more or less equivalently to the treatment mean response, while the control group participants all/most resemble the control mean, and, therefore, that the mean group difference is representative, or typical, of the effect of the treatment (Figure 1a). This state, where the mean response is representative of all/most participant responses, rarely the case, however, and frequently the distributions of the individual's responses overlap between the groups and/or the mean difference is a product of the influence of a group of cases which react the most to the treatment. The cases might be both, traditionally considered to be outliers (over 3.3SD), but more often the group of "non--outlier" cases is still influential enough to significantly move the mean (A, Figure 1b).

For example, Grice, Barrett, Cota, Felix, Taylor, Garner, Medellin, and Vest (2017) have recently shown, in a reanalysis of an earlier study, an instance where only 30% of the sample produced data consistent with the purported statistically significant mean group difference. The mean difference is not, in such circumstances, a perfect (or even reliable) representation of the response of individuals to the treatment, yet it is commonly interpreted as if it was (Jacobson & Truax, 1991; Speelman & McGann, 2013). Furthermore, the distributional assumptions underlying NHST, namely that the distributions are approximately normal, have been shown to be largely untrue (Micceri, 1989), casting further doubt on this form of statistical inference and the nomothetic conclusions reached.

These problems are compounded when used in longitudinal, repeated-measures designs (i.e., designs that involve repeated observations of the same participants over time) such as the widely used randomized control designs of clinical/applied psychology. In such designs, it is widely recognised that the treatment group mean may conceal a range of individual responses from a strong positive response to treatment, to no response, to deterioration (Barlow & Nock, 2009). This is the same issue as noted above as problematic when treatment groups are compared just in terms of their means. Longitudinal research, where there are repeated measures of each individual has a further problem arising from the fact that, in taking the average of observations at the different time points, it is not possible to follow changes in any particular individual (Speelman & McGann, 2013); group mean trends over time in response to some treatment would remain unaltered even if the rank order of each individual's response was reversed at each measurement point (Figure 1c). The consistency of any individual's response to treatment is, however, clearly a matter of vital importance in understanding the therapeutic effect of any treatment but is entirely concealed by group averaging (Jacobson & Truax, 1991).

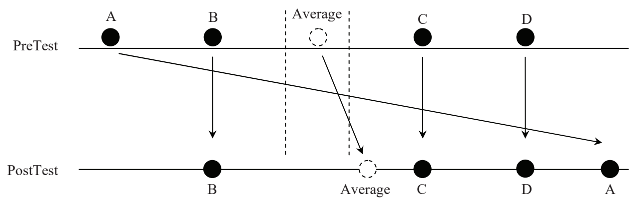
Thus, both for studies concerned with simultaneous comparisons of groups and those that seek to track change over time, the conventional nomothetic methods

Figure 1a. The example of "ideal" change in group comparison designs



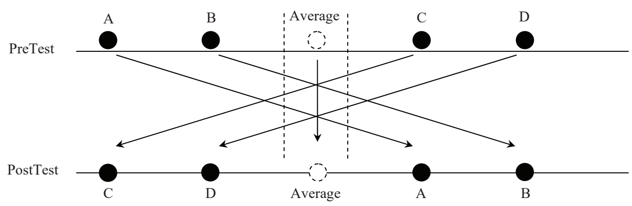
Black dots represent participants, the dot with dotted outline represents the average result for the group. Dotted lines represent statistically significant boundaries for differences between averages.

Figure 1b. The example of "false" detection of change due to group of outliers or influential cases



Other features as for Fig 1a.

Figure 1c. An example of lack of change in the average when, in fact, cases are mutually interchanged from PreTest to PosTest



Other features are as for Fig 1a.

create “bottlenecks” where simplifying reality in pursuit of the general may be highly misleading. As an example of serious consequences of researching exclusively in the nomothetic paradigm without proper attention to individual response consider what may occur when the clinical condition of some patients with depression deteriorates after a psychological intervention. They may require immediate psychological assistance, but the researcher is not able to see the deterioration because it is concealed by the group averaging (Busch et al., 2011). Recent recognition of the weakness of research relying only on interpretation of statistically significant group mean differences (Wasserstein & Lazar, 2016) has led to increasing emphasis on the direct measurement of the size of the effect of any treatment via various Effect Size (ES) measures (see Cumming, 2012; 2014; Kline, 2013) and to stronger emphasis on the precision (or lack thereof) of any sample mean as an estimate of the population parameter; an approach known as *the new statistics* (Cumming, 2012; 2014; Cumming & Calin-Jageman, 2017). Although an improvement over conventional standard research practices, the new statistics approach is still fundamentally nomothetic.

Being more idiographic in quantitative research

What, then, can we do to be more idiographic in our research? In the article, we want to present the methods which make individual’s quantitative data more visible on the whole (see Barlow & Nock, 2009; Hermans, 1988).

It is important to note that idiographic research is not the same as Individual-Based research. An idiographic approach addresses the time-dependent variation within single individuals, prior to pooling across other individuals (Molenaar, 2004). In contrast, individual-based research can provide information about particular individuals based on known properties of their populations. RCI and mBPs are nice examples of this: They are tools to characterize inter-individual differences in change and provide useful information about the individuals in a sample. But they are nomothetic, not idiographic; thus we are using the phrase “being more idiographic”.

There are many methods that allow the data to be analysed in a more idiographical way. One is multilevel modelling, which models intra-individual change, and then aims to characterize variability (or commonality) across people. In such case measurements are analysed on the lowest level 1 while individuals are placed on level 2. However, in order to use the MLM, certain statistical requirements, such as the minimum number of measurements at level 1, must be met (see Łaguna, 2018; Nezlek, 2012). There are also other methods as Experience Sampling Methods (Conner, Tennen, Fleeson, & Barrett, 2009) and Group iterative multiple model estimation (GIMME; Beltz, Wright, Sprague, & Molenaar, 2016) worth to be considered. All the above mentioned methods are beyond the scope of this article, therefore we encourage the reader to refer to the given literature. In this article we focus only on Reliable Change Index and Modified Brinley Plots.

The concept of Reliable Change

In an important series of papers beginning in 1984, the late Neil Jacobson and his colleagues developed techniques for determining the reliability of any change observed by individual participants in any repeated-measures design such as an RCT examining therapy outcome (Jacobson, Follette, & Revenstorf, 1984; Jacobson & Revenstorf, 1988; Jacobson & Truax, 1991). Their aim was to place the judgement of clinical significance (Wise, 2004) on a sound footing, where they defined a clinically significant change following treatment as one which moved an individual from a dysfunctional to functional state (Jacobson et al., 1984). Note that this is a judgement about **individual** change, not group averages. In this context, a reliable change, determined for each individual by reference to an index (Reliable Change Index; RCI) calculated on the basis of the psychometric properties of the measure, is one that is larger than that likely to be observed due to measurement error alone, specified in terms of a criterion probability, often $p < .05$. Equalling or exceeding the RCI is a prerequisite for classifying any individual as exhibiting clinically significant change.

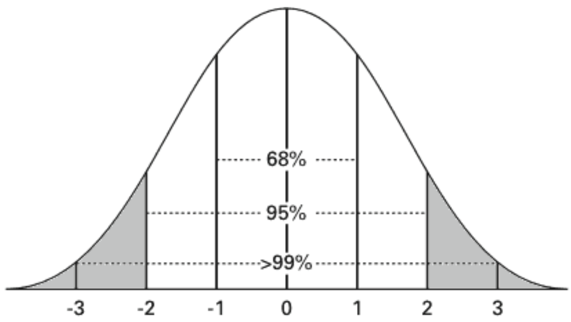
Jacobson and colleagues described how to calculate RCI for any individual study participant with repeated measures on any specific measure. Based on the psychometric properties of the measure, notably, its Standard Error of Measurement, one can calculate the Standard Error of the Difference ($S_{diff} = \sqrt{2(SE)^2}$; $SE = SD_{PreTest} \times \sqrt{1 - \alpha_{PreTest}}$, where $SD_{PreTest}$ = standard deviation of PreTest, $\alpha_{PreTest}$ = reliability of PreTest (e.g. Cronbach’s alpha[2]); Jacobson & Truax, 1991; Massen, 2004). It is worth noting that in the literature there are different ways to calculate the Standard Error of Measurement and they may lead to very different results (cf., Christensen & Mendoza, 1986; Maassen, 2000; 2004).

For any individual’s change (from PreTest to PostTest) to be reliable, their difference score divided by S_{diff} must ≥ 1.96 (for $p < .05$; see Figure 2). Note that the change may be in the desired/therapeutic direction (positive reliable change; improvement) or in the opposite direction (reliable deterioration). Individuals whose change scores are not reliable (i.e., indeterminate) cannot be viewed as having changed any more than expected due to measurement error alone. For instance, for a psychometric measure with a test-retest reliability = 0.7 and a mean of 15 (in some reference or standard sample), the S_{diff} = 11.6. An individual with a difference score $\leq \pm 22$ will not be classified as showing $RCI_{.05}$ (22/11.6 = 1.89 < 1.96); any individual with a difference score of $\geq \pm 23$ has shown reliable change (23/11.6 > 1.96). Only if positive RCI has been observed is it then meaningful to consider if the change is also clinically significant (Jacobson & Truax, 1991). As Figure 2 and Wise (2004) show, other cut-off criteria can be used to determine reliable change using more or less stringent probability criteria. Taking this a step further, the proportion of the sample treated who have achieved

[2] I thank the reviewer for his valuable remarks.

positive reliable change (RCI+; Blampied, 2017), is another ES measure related to, but more stringent than, Percent Superiority (also known as the Common Language Effect Size; Lakens, 2013).

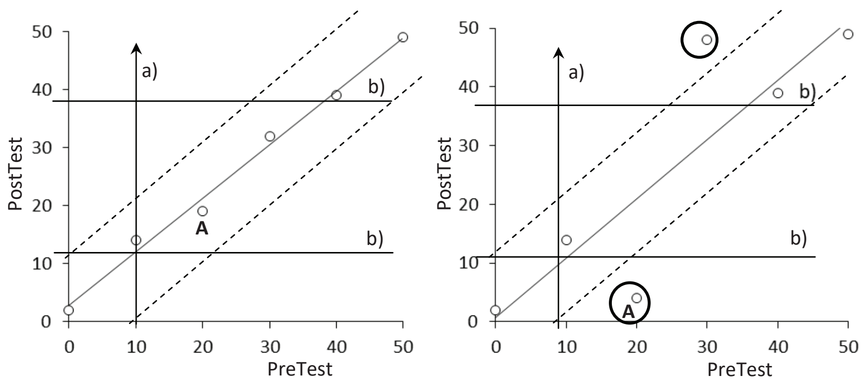
Figure 2. The normal distribution of errors of measurement (the Standard Error of Measurement and the Standard Error of the Difference) showing the boundaries for determining Reliable Change at different levels of probability (e.g., $p < .05$, for $z = 1.96$; ≈ 2 SD).



Modified Brinley Plots

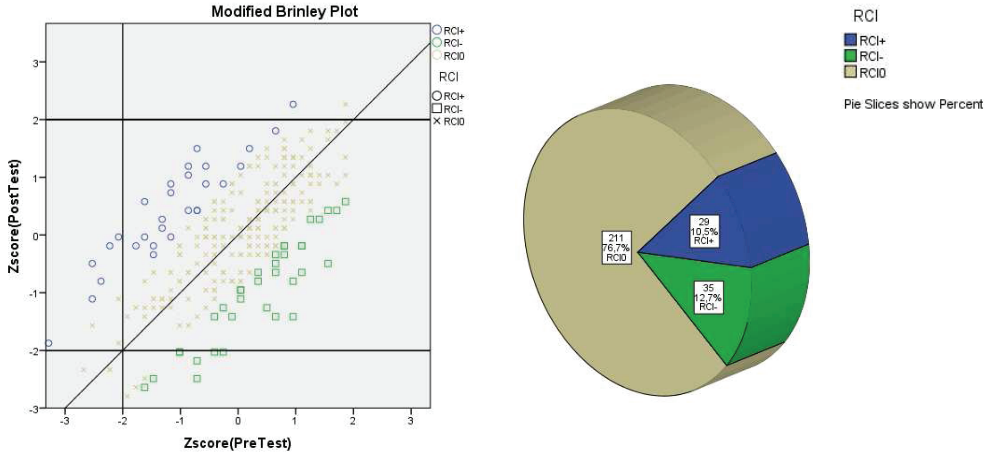
As Jacobson and colleagues also showed (Jacobson, et al., 1984) it is possible to integrate information about RCI in graphs that visually display an individual change in the context of the changes observed for all other participants in the study (and, if desired, group means, standard deviations, and/or confidence intervals). These graphs have recently been christened *modified Brinley Plots* (mBP; Blampied, 2017a). These are a type of scatter--plot that compares an individual's scores at two time points as coordinate points – their first measurement (called PreTest, placed on the X-axis) is plotted against their score at another later measurement (called PostTest, placed on the Y-axis). In such a plot, the 45° diagonal line from the origin defines the line of no effect (where $X = Y$, no change over time). To the extent that there has been a change in an individual's scores from PreTest to PosTest, this will be evident because their data point will shift away upward or downward from the diagonal. Boundaries of the RCI can also be drawn as lines parallel to the central 45^0 line. An additional feature of the plot is the provision of horizontal and vertical lines that cut the axes at clinical cut-offs, however these may be determined (Jacobson & Truax, 1991). In this way, individual change and the extent to which it is reliable, and in clinically desirable or undesirable directions, can instantly be seen (Figure 3). Those individuals who (a) show change > RCI, and (b) have moved from the clinical to the non-clinical region of the graph have shown both reliable and clinically significant change (Blampied, 2017a). Blampied (2017a) has further shown how additional information about group averages, confidence intervals on the means, various effect size measures, and confidence intervals on the effect size can also be displayed, thereby placing information about individual change in the context of change in the group as described in nomothetic terms (by group means, ES, etc). Furthermore, if the graph is in digital format, additional qualitative and quantitative idiographic information can be hyperlinked to any data point, providing even richer information about each individual in the context of all other individuals in the treatment groups, and any other relevant groups also displayed (Blampied, 2017b). Demonstrations of the utility of these plots, including information about the RCI and clinical significance can be seen in Gordon, Rucklidge, and Blampied (2015), Lothian, Blampied, and Rucklidge (2016), Sole, Rucklidge, and Blampied, (2017), and Sheldon, Clarke, and Moghaddam (2015).

Figure 3. Examples of modified Brinley Plots (after Blampied, 2017a)



The left plot shows hypothetical data where the individuals whose data are shown demonstrate no reliable change, i.e., their data is indeterminate with respect to change. The right scatterplot shows hypothetical data from participants who are indeterminate, and from one who displays positive reliable change and another showing reliable deterioration (both circled data points). The 45° diagonal line represents the line of no change. Parallel 45° dotted diagonal lines represent the margins of reliable change, calculated using the method of Jacobson and Truax (1991). Horizontal solid lines (b) represent the value of a clinical cut-off. The arrowhead on the vertical line (a) indicates the direction of clinical improvement.

Figure 4. An example of a modified Brinley Plot as an output from the IBM SPSS Statistics designed syntax: (a) a specific form of scatterplot – mBP, including clinical cut-off lines, the diagonal 45° line of no change (X = Y), and symbols showing cases demonstrating positive reliable change (RCI⁺), reliable deterioration (RCI⁻) and indeterminate change (RCI0), (b) pie chart with percentage of RCI⁺, RCI⁻ and RCI0.



(a) (b)

Limitations

RCI and mBP are methods having own limitations. First, both allow to look at data in a more idiographical way, but still considered as nomothetic [within an-based research framework] because they provide information about particular individuals based on known properties of their populations. Second, mBP is mainly suited for pre- and post-test designs. Even if a study consists of more than two measurements, only a selected two can be analysed at the time. Third, the RCI by its nature has quite stringent cut offs[3], thus, many not apply to all research situations.

IBM SPSS Statistics® syntax

Software to compute the RCI and to plot modified Brinley plots is now available as a designed syntax to the popular statistical package SPSS IBM Statistics® which is available at the end of the article or can be downloaded from the publisher website. The syntax computes RCI in following steps. First, it calculates the Standard Error for PreTest variable, then calculate Standard Error of Measurement with the formula of Jacobson & Truax (1991). Second, it creates the grouping variable with observations referring to positive (RCI⁺), negative (RCI⁻) and no reliable change (RCI0). Finally, it plots two useful and informative graphs: (1) a pie chart with percentage of RCI⁺, RCI⁻ and RCI0; and (2) a modified Brinley plot, which marks cases for RCI⁺, RCI⁻ and RCI0, including clinical cut-off lines (2SD), standardized scales for Pretest and Posttest variables and the diagonal 45° line of no change ($X = Y$, specified as the equation $y = 1 * x + 0$ in SPSS Chart Editor). At the end it lists the percentage of three RCI values divided by all observations (RCI0 + RCI⁻ + RCI⁺): RCIp (RCI⁺), RCIn (RCI⁻), RCI0 and RCIΔ, which represents the difference between RCI⁺ and RCI⁻. Figure 4 shows an example of the output of the program.

Discussion

Our analysis shows that in contemporary psychological literature, nomothetic and idiographic approaches can be treated as complementary to each other rather than in opposition, notwithstanding the historical bias interpreting the nomothetic approach in psychological research as more "scientific" than the idiographic one (Skaggs, 1945). Such a viewpoint has its definite origin in the positivistic conception of science by A. Comte (1961).

It should be inspiring for our discussion to turn back to some founders of the methodology of empirical psychology like Ch. Wolff (1732), J. F. Herbart (1822, 1824–1825), and W. Wundt (1900–1920, 1914). Starting from Wolff's *Psichologia empirica* (1732), one may learn that a science of psychometrics, proposed by this author for the first time in the history of psychology, is possible, based on judgements *a posteriori* which constitute observation and experiments both in the natural sciences and in psychology as well. In discussion with G. Leibniz, Wolff elaborated his conception of *aperception* in which there is a space both for nomothetic and idiographic interpretation of human behaviour (see: Biela, 2018 in press). Similar interpretation can be done for the work of J. F. Herbart (1822, 1824–1825) concerned with applying mathematics to psychology as science, where the subjects of psychological analysis are both repeated human behaviours or unique and individual ones.

Wundt (1914), in turn, evidently applied the nomothetic approach in his psychological laboratory and in collecting experimental data which give a base for inductive reasoning to produce the first psychological rules in the history of psychology (Danziger, 1990). However, in his

[3] I thank the reviewer for his valuable remarks.

Völkerpsychologie, he goes beyond the nomothetic model and experimental method, towards broader understanding of empirical psychology, where is accepted that an idiographic approach to interpreting human behaviour is possible and psychology can be treated as a humanistic science (Wundt, 1900–1920).

From the above discussion we can conclude that psychology should be understood not as an intrinsically contradictory discipline polarized between nomothetic and idiographic approaches, but as embracing the two approaches, i.e., nomothetic or idiographic, as complimentary. As a such, psychology belongs to both the natural sciences and the humanistic sciences as well.

Conclusion

In concluding, we argue that nomothetic and idiographic approaches should not be considered as opposing viewpoints but rather as complementary to each other, as Windelband originally proposed. Further, we have argued that many problems of the nomothetic-dominated research in Psychology would benefit from a more balanced approach. Finally, we presented analysis and software tools (as an SPSS Statistics plug-in) which largely automate the tasks of computing RCI and plotting individual's repeated-measures data in modified Brinley Plots which show idiographic information about individual changes in the nomothetic context of group change.

References

Allport, G. W. (1935). Attitudes. In C. Murchison (Ed.), *Handbook of social psychology* (pp. 798–844). Worcester, MA: Clark University Press.

Allport, G. W. (1937). *Personality: A psychological interpretation*. New York: Henry Holt and Company. http://doi.org/10.1037/h0052567

Allport, G. W. (1948). *The use of personal documents in psychological science*. New York, NY: Social Science Research Council.

Barlow, D. H., & Nock, M. K. (2009). Why can't we be more idiographic in our research? *Perspectives on psychological Science*, *4*, 19–21.

Beltz, A. M., Wright, A. G., Sprague, B. N., & Molenaar, P. C. (2016). Bridging the nomothetic and idiographic approaches to the analysis of clinical data. *Assessment*, *23*(4), 447–458.

Blampied, N. M. (2013). Single-case research designs and the scientist-practitioner ideal in applied psychology. In G. Madden (Editor-in-Chief). *APA Handbook of Behavior Analysis, Vol 1. Methods and Principles* (pp. 177–197). Washington, DC: American Psychological Association.

Blampied, N. M. (2017a). Analysing therapeutic change using modified Brinley plots: History, construction, and interpretation. *Behavior Therapy*, *48*, 115–127. doi: 10.1016/j.beth.2016.09.002

Blampied, N. M. (2017b). *Being idiographic in a nomothetic world – Why and how*. School of Psychology Colloquium, Victoria University of Wellington, 25th August.

Busch, A. M., Wagener, T. L., Gregor, K. L., Ring, K. T., & Borrelli, B. (2011). Utilizing reliable and clinically significant change criteria to assess for the development of depression during smoking cessation treatment: The importance of tracking idiographic change. *Addictive Behaviors*, *36*, 1228–1232. http://dx.doi.org/10.1016/j.addbeh.2011.07.031.

Cattell, R. B. (1946). *Description and measurement of personality*. Oxford: World Book Company.

Comte, A. (1961). *Metoda pozytywna w szesnastu wykładach*. Warszawa: PWN.

Conner, T. S., Tennen, H., Fleeson, W., & Barrett, L. F. (2009). Experience sampling methods: A modern idiographic approach to personality research. *Social and personality psychology compass*, *3*(3), 292–313.

Cronbach, L. J. (1957). The two disciplines of scientific psychology. *American Psychologist*, *12*, 671–694.

Crossman, A. (2019, Jane 4). Definition of Idiographic and Nomothetic. Retrieved from https://www.thoughtco.com/nomothetic-3026355

Cumming, G. (2012). *Understanding the new statistics*. New York, NY: Routledge.

Cumming, G. (2014). The new statistics: Why and how. *Psychological Science*, *25*(1), 7–29.

Cumming, G., & Calin-Jageman, R. (2017). *Introduction to the new statistics*. New York, NY: Routledge.

Danziger, K. (1990). *Constructing the subject: Historical origins of psychological research.* New York, NY: Cambridge University Press.

Eysenck, H. J. (1952). *The scientific study of personality*. London: Routledge.

Eysenck, H. J. (1966). Personality and experimental psychology. *Bulletin of the British Psychological Society*, *19*, 1–28.

Eysenck, H. J. (1981). *A model for personality*. New York: Springer-Verlag.

Gordon, H., Rucklidge, J. J., & Blampied, N. M. (2015). Clinically Significant Symptom Reduction in Children with Attention-Deficit/Hyperactivity Disorder Treated with Micronutrients: An Open-label Reversal Design Study. *Journal of Child and Adolescent Psychopharmacology*, *25*(10), 783–798. doi: 10.1089/cap.2015.0105

Grice, J. W. (2011). *Observation oriented modeling: Analysis of cause in the behavioral sciences*. London: Academic Press.

Grice, J. W. (2015). From means and variances to persons and patterns. *Frontiers in Psychology*. Published online 24 July 2015. doi: 10.3389/fpsyg.2015.01007

Grice, J., Barrett, P., Cota, L., Felix, C., Taylor, Z., Garner, S., Medellin, E., & Vest, A. (2017). Four bad habits of modern psychologists. *Behavioral Sciences*, *7* (53). doi: 10.3390/bs7030053

Herbart, J. F. (1822). *Ueber die Möglichkeit und Nothwendigkeit: mathematik auf psychologie Anzuwenden*, Königsberg, Gebrüdern Bornträger.

Herbart, J. F. (1824–1825). *Psychologie als Wissenschaft, neu gegruendet auf Ehrfahrung, Metaphysik und Mathemati*k, Königsberg, August Wilhelm Unzer.

Hergenhahn, B. R., & Henley, T. B. (2014). *An Introduction to the History of Psychology* (7th ed.). Belmont: Wadsworth, Cengage Learning. http://doi.org/10.1037/a0024800

Hermans, H. J. M. (1988). On the integration of nomothetic and idiographic research methods in the study of personal meaning. *Journal of Personality*, *56*(4), 785–812. http://doi.org/10.1111/j.1467-6494.1988.tb00477.x

Hommel, B., & Colzato, L. S. (2017). The grand challenge: Integrating nomothetic and ideographic approaches to human cognition. *Frontiers in Psychology.* Published online 31 January, 2017. doi: 103389/fpsyg.2017.00100

Jacobson, N. S., Follette, W. C., & Revenstorf, D. (1984). Psychotherapy outcome research: Methods for reporting variability and evaluating clinical significance. *Behavior Therapy*, *15*, 336–352.

Jacobson, N. S., & Revenstorf, D. (1988). Statistics for assessing the clinical significance of psychotherapy techniques: Issues, problems, and new developments. *Behavioral Assessment*, *10*(2), 133–145.

Jacobson, N. S., & Truax, P. (1991). Clinical significance: a statistical approach to defining meaningful change in psychotherapy research. *Journal of Consulting and Clinical Psychology*, *59*(1), 12–19. http://doi.org/10.1037/0022-006x.59.1.12

Kline, R. B. (2013). *Beyond significance testing* (2nd Ed.). Washington, DC: American Psychological Association.

Łaguna, M. (2018). Wprowadzenie do wielopoziomowej analizy danych. *Polskie Forum Psychologiczne*, *23*(2), 377–394. doi: 10.14656/PFP20180209

Lakens, D. (2013). Calculating and reporting effect sizes to facilitate cumulative science: A practical primer for t-tests and ANOVAs. *Frontiers in Psychology*, *4*, 863. http://dx.doi.org/10.3389/fpsyg.2013.00863

Lamiell, J. T. (1998). 'Nomothetic' and 'Ideographic': Contrasting Windelband's understanding with contemporary usage. *Theory and Psychology*, *8*(1), 23–38.

Lamiell, J. T. (2009). Reviving person-centered inquiry in psychology: Why it's erstwhile dormancy? In J. Valsiner, P. C. M. Molenaar, C. D. P. Lyra, & N. Chaudhary, (Eds.). *Dynamic process methodology in the social and developmental sciences* (pp. 31–43). New York, NY: Springer.

Lothian, J., Blampied, N. M., & Rucklidge, J. J. (2016). Effect of micronutrients on insomnia in adults: A multiple-baseline study. *Clinical Psychological Science* On-line first doi: 10.1177/2167702616631740

Meehl, P. E. (1978). Theoretical risks and tabular asterisks: Sir Karl, Sir Ronald, and the slow progress of soft psychology. *Journal of Consulting and Clinical Psychology*, *46*, 808–834.

Micceri, T. (1989). The unicorn, the normal curve, and other improbable creatures. *Psychological Bulletin*, *105*, 156–166.

Molenaar, P. C. M., & Campbell, C. G. (2009). The new person-specific paradigm in psychology. *Current Directions in Psychological Science*, *18*(2), 112–117.

Nesselroade, J. R. (2010). On an emerging third discipline of scientific psychology. In P. C. M. Molenaar & K. M. Newell (Eds.). *Individual pathways of change: Statistical models for analysing learning and development* (pp. 209–218). Washington, DC: American Psychological Association.

Nezlek, J. B. (2012). Multilevel modeling for psychologists. In H. Cooper, P. M. Camic, D. L. Long, A. T. Panter, D. Rindskopf, & K. J. Sher (Ed.), *APA handbook of research methods in psychology. Vol. 3: Data analysis and research publication* (pp. 219–241). Washington, DC: American Psychological Association

Nickerson, R. S. (2000). Null hypothesis significance testing: A review of an old and continuing controversy. *Psychological Methods*, *5*, 241–301.

Pestcher, Y. (2016). Do our means of enquiry match our intentions. *Frontiers in Psychology*. Published online 19 July 2016. doi: 10.3389/fpsyg.2016.01048

Rogers, C. R. (1947). Some observations on the organization of personality. *American Psychologist*, *2*(9), 358–368. http://doi.org/10.1037/h0060883

Sheldon, K. L., Clarke, S. P., & Moghaddam, N. (2015). Clinical effectiveness of a pain psychology service within an outpatient care setting. *The Mental Health Review*, *20*(3), 166–176.

Silverman, D. (Ed.). (2011). *Qualitative research: Issues, of theory, mehtod and practice*. London, UK: Sage.

Silverstein, A. (1988). An Aristotelian resolution of the idiographic versus nomothetic debate. *American Psychologist*, *43*(6), 425–430.

Skaggs, E. B. (1945). Personalistic psychology as science. *Psychological Review*, *52*(4), 234–238.

Sole, E. J., Rucklidge, J. J., & Blampied, N. M. (2017). Anxiety and stress in children following an earthquake: Clinically beneficial effects of treatment with micronutrients. *Journal of Child & Family Studies*. doi: 10.1007/s10826-016-0607-2

Speelman C. P., & McGann, M. (2013). How mean is the mean? *Frontiers in Psychology.* Published online 23 July 2013. doi: 10.3389/fpsyg.2013.00451

Speelman, C. P., & McGann, M. (2016). Editorial: Challenges to mean--based analysis in psychology: The contrast between individual people and general science. *Frontiers in Psychology*. Published online 19 August, 2016. doi: 10.3389/fpsyg.2016.01234

Streiner, D. L. (2004). Editorial: Measuring individual level change. *Journal of Personality Assessment*, *8*(2), 48–49.

Trafimow, D. (2014). THe mean as a multilevel issue. *Frontiers in Psychology.* Published online 27 February 2014. doi: 10.3389/fpsyg.2014.00180

Valsiner, J. (1986). Where is the individual subject in scientific psychology? In J. Valsiner (Ed.), *The individual subject and scientific psychology* (pp. 1–14). New York, NY: Plenum.

Wasserstein, R. L., & Lazar, N. A. (2016). The ASA's statement on p-values: Context, process and purpose. *The American Statistician*. doi: 10.1080/00031305.2016.1154108

Wilkinson, L., & the Task Force on Statistical Inference. (1999). Statistical methods in psychology journals: Guidelines and explanations. *American Psychologist*, *54*, 594–604.

Windelband, W. (1990/1998). History and natural science. *Theory and Psychology*, *8*(1), 5–22. [Translated from the German by J. T. Lamiell].

Wise, E. A. (2004). Methods for analysing psychotherapy outcomes: A review of clinical significance, reliable change, and recommendations for future directions. *Journal of Personality Assessment*, *82*, 50–59.

Wolff, Ch. (1732). *Psychologia empirica, metoda scientifi ca, pertractata, qua eat, quae de anima Humana indubia experientiae fi de constant, continentur et ad solidam universae philosophiae practicae ac theologiae naturalis tractationem via sternitur*. Francofurti & Lipsiae: Offi cina Libraria Regeriana.

Wright, D. B. (2009). Ten statisticians and their impacts for psychologists. *Perspectives on Psychological Science*, *4*, 587–597.

Wundt, W. (1900–1920). *Völkerpsychologie – Eine Untersuchung der Entwicklungsgesetze von Sprache, Mythus und Sitte*, Leipzig, Alfred Kröner, (10 Bände, 1900 bis 1920).

Wundt, W. (1911). *Einleitung in die Psychologie*, Leipzig Kröner,

Wundt, W. (1911, 1914). *Sinnliche und übersinnliche Welt*. Kröner, Leipzig, Kröner.

IBM SPSS syntax:

```
**************************************************************************************
A U T H O R S' I N F O R M A T I O N
**************************************************************************************
The syntax below is a part of the article and can be used on the licence in accordance with the article.
/* Appreciating the effort and time to prepare below syntax, please cite when you use it as below:

/* DEFINING PART
**************************************************************************************

compute PreTest = x.     /* Insert the PreTest variable after the equal sign /.
compute PostTest = y.     /* Insert the PostTest variable after the equal sign /.
execute.

/* Insert the reliability value for the PreTest variable [e.g. Cronbach's Alpha, McDonald's Omega, ...
/* Greatest Lower Bound to Reliability Woodhouse & Jackson (1977), etc.].

DEFINE Reliability () 0.88 !ENDDEFINE.

* CALCULATION PART
**************************************************************************************

SET printback=off.
oms /select all /destination viewer = no.
dataset name Dataset1.
dataset declare TempSet.
dataset copy TempSet.
dataset activate TempSet.

aggregate /outfile=* mode=addvariables overwrite=yes
  /break /PreTest_SD=sd(PreTest).

  /* estimation of Standard Error of Measurement formula of Jacobson & Truax (1991), after Christensen & Mendoza (1986) /.
compute #SE=PreTest_SD * SQRT(1-Reliability).
compute #Sdiff=SQRT(2 * (#SE ** 2)).
compute Diff=(PostTest – PreTest) / #Sdiff.
execute.

  /* compution of a categorical variable with three categories of observations: positively, negatively and no changed /.
do if diff >= 1.96.
  compute RCI = 1.
- else if diff <= -1.96.
  compute RCI = 2.
- else.
  compute RCI=3.
- end if.
value labels RCI 1 ,RCI+' 2 ,RCI-' 3 ,RCI0'.
execute.

descriptives variables=pretest posttest     /* standardization of pretest and posttest variables /
  /save /statistics=mean.
```

```
formats zPreTest zPostTest (f3.0).
omsend.
IGRAPH /summaryvar=$pct /color=var(RCI) type=categorical     /* drawing a bar chart /
/effect=three /pie start 45 cw slice=inside label pct n.
IGRAPH /x1=var(ZPreTest) /y=var(zPostTest) /style=var(RCI)     /* drawing a scaterplot /
/color=var(RCI) type=categorical /scatter /refline zPostTest 2
/refline zPostTest -2 /refline ZPreTest -2 /title ‚Modified Brinley Plot'.
execute.

IF RCI = 1 RCp =1.     /* exctacting the all positively changed cases /.
IF RCI = 2 RCn =1.     /* exctacting the all negatively changed cases /.
IF RCI = 3 RC0 =1.     /* exctacting the all no changed cases /.
execute.

aggregate /outfile=* mode=addvariables overwrite=yes     /* summing the all positively, negatively and no changed cases /
/RCp=SUM(RCp) /RCn=SUM(RCn) /RC0=SUM(RC0).

compute #RCDiff = RCp – RCn.
compute RCIp = RCp / (RCp + RCn + Rc0).     /* calculation of percentage of all positively changed cases /.
compute RCIn = RCn / (RCp + RCn + Rc0).     /* calculation of percentage of all negatively changed cases /.
compute RCI0 = RC0 / (RCp + RCn + Rc0).     /* calculation of percentage of all no changed cases /.
compute RCIΔ = #RCDiff / (RCp + RCn + Rc0).     /* calculation of percentage of all positively minus negatively changed cases /.
execute.

filter off.
use all.
select if ($casenum < 2).
execute.

LIST RCIp RCIn RCI0 RCIΔ.     /* Listing the cases /.
dataset activate Dataset1.
dataset close TempSet.
execute.

do if $casenum = 1.     /* displaying the legend for listing variables /.
- print /'L E G E N D'.
- print /'> RCIp [also RCI+] means a % of positive influence'.
- print /'> RCIn [also RCI-] means a % of negative influence'.
- print /'> RCI0 [also RCI0] means a % of no reliable influence'.
- print /'> RCIΔ means a % of subtraction of negative from positive influence'.
end if.
end case.
execute.
```