This is the Author's version of the paper published as:

Author Address: lritter@csu.edu.au
Abstract: This paper looks at the paradox of how recognition of diversity through research into individual differences, in such areas as learning style, cognitive style and personality, has had the reductionist effect of promoting commonality. This has been the outcome of the competition between inventories; the reduction of diversity to characteristics which can be defined, categorised and measured; and the application of these theories of diversity to facilitate and justify the tendency to promote commonality in learning and teaching behaviour in universities.

Unfulfilled promises: how inventories, instruments and institutions subvert discourses of diversity and promote commonality

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Abstract

This paper looks at the paradox of how recognition of diversity through research into individual differences, in such areas as learning style, cognitive style and personality, has had the reductionist effect of promoting commonality. This has been the outcome of the competition between inventories; the reduction of diversity to characteristics which can be defined, categorised and measured; and the application of these theories of diversity to facilitate and justify the tendency to promote commonality in learning and teaching behaviour in universities.

Diagnosing and containing diversity: how inventories, instruments and institutions subvert discourses of diversity to promote commonality

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Introduction

Competing tendencies towards diversity and commonality reflect philosophical debate about whether the desired outcomes of tertiary education should promote homogeneity or heterogeneity, which in turn is the product of tension between expecting education to benefit the individual through encouraging empowerment, confidence, creativity and self-actualisation (Maslow, 1970) or to benefit society through promoting compliance, conformity and accommodation (Foucault, 1988; Goffman, 1961).

Improving outcomes for individuals requires authentic appreciation and accommodation of diversity among learners, as it has been shown to enhance motivation, speed and efficiency of learning, effective use of course resources, breadth of participation, academic achievement, and lifelong learning (Logan & Thomas, 2002; Biggs, 2001; Briggs, 2000; Yates, 2000; Garton et al, 1999; Lang et al, 1999; Riding and Raynor, 1999; Furnham, 1992). It has consequently become axiomatic that good teachers recognise and support diversity.

At the same time, however, commonality is valued as an aid to social and professional cohesion. This is evident in control of curriculum and prescription of outcomes by the governments who fund tertiary education and the professional bodies that accredit tertiary education. It can be served, even as lip-service is paid to recognising diversity, by containing diversity within models; taming diversity through categorisation and measurement; and adopting learning and teaching praxis that enhances commonality rather than diversity.

Psychometric recognition of diversity

As the only thinking we experience is our own, there is a tendency to assume that everyone thinks in a similar way, but this assumption has been challenged by psychometric research into theories of difference. This research came to the fore in the 1970s, when theories about differences in learning style resonated with a growing culture of individualism. Ensuing demands for more research to examine the relationship between individual differences and types of teaching and instructional presentation produced a multiplicity of new frameworks and corresponding psychometric instruments (Sternberg & Grigorenko, 2001; Garner, 2000; Riding & Raynor, 1999).

Psychometric research has appeared to promote diversity through the variety of theories and models that have emerged across a range of taxonomies, including 'learning style', 'cognitive style' and 'personality dimensions'. Over several decades diversity has been diagnosed in such areas as: how structured people want their instructional activities to be; their preferred level of social interaction in the learning process; the extent to which they like to categorise things with labels; the degree to which they like to fit parts together to make wholes; their tolerance for unrealistic experiences; the degree to which they seek to verify judgements; and their preference for concrete or abstract organisation of space and sequential or random organisation of time. The taxonomy of psychological types adds extroversion v. introversion, intuitive v. empirical, thinking v. feeling, and perceptive (face-value) v. judging (interpretive) (Renzulli & Dai, 2001; Sternberg & Grigorenko, 2001).

The discourse of the researchers into learner differences also suggests their work promotes diversity, from Dunn and Dunn's 1974 definition of learning style as 'the way in which biological and developmental personal characteristics make different methods of teaching appropriate for some students but not for others' (Riding & Raynor, 1999) to the heralding of Kolb's Learning Styles Inventory as 'an appreciation for diversity, … promoting an atmosphere of greater appreciation for differences among learners' (Koob & Funk, 2002) or Garner's (2000) reference to 'The thousand flowers which Tyler wishes to see bloom'. Thus the impression is that different learners preferring

different styles is intrinsically a pluralist concept - at least noting an array of approaches to learning, and at most including all the choices and reactions of people in response to all the situations they encounter (Koob & Funk, 2002; Sternberg, 2001; Riding & Raynor, 1999).

This theoretical research has the potential to contribute towards authentically accommodating diversity in practice, if it leads to a wide variety of teaching methods, respect for individual differences between students, and empowering students as learners by maximising their access to, and control over, preferred ways of learning (Harrison, 2001; Briggs, 2000; Riding & Raynor, 1999; Stahl, 1999). Appropriate use of instruments would support accommodation of diversity by facilitating matches between student and learning environment or between student and teacher (Banks, 1995 in Gutierrez & Rogoff, 2003). It would also facilitate teachers in accommodating and encouraging student diversity by adapting teaching environments and processes to facilitate optimum learning for the maximum number of learners. The instruments could also be used to give students some insight into their own preferences, thereby helping them to identify which approaches to learning work for them and which they should develop strategies to manage, or try to avoid (Gutierrez & Rogoff, 2003; Logan & Thomas, 2002; Smith, 2002; Renzulli & Dai, 2001; Briggs, 2000; Zhang & Sternberg, 2000; Lang et al, 1999).

Attempts to convert psychometrically based discourses of diversity to praxis first appeared in school classrooms, rather than at tertiary level, because children from all classes and of all abilities attend school, and failure to offer appropriate learning material and teaching seemed to particularly jeopardise learners from the lower end of the intelligence range (Riding & Raynor, 1999). The theories affected practice most commonly at the instrumental level of use of self-assessment questionnaires on learning styles (Briggs, 2000) but, also, sometimes at the curriculum level in being used to justify the introduction of alternative approaches, such as project- and problem-based learning, collaborative and community-focused activities, real-world learning and learner-driven actions (Harrison, 2001; Trilling & Hood, 2001; Riding & Raynor, 1999).

Interest in the research has grown at tertiary level more recently as staff/student ratios have increased, and extended access to university has broadened the types of learner arriving there (Smith, 2002; Briggs, 2000; Garton et al, 1999). These changes reduced the effectiveness of traditional individualised forms of teaching and autonomous models of learning, and concern about attrition rates tapped into evidence that failure to match teaching with preferred modes of learning enhanced the risk of withdrawal or failure, particularly for already disadvantaged groups (Smith, 2002). The growth of distance education further highlighted diversity, with questions about differences in learning styles between distance education students and their on-campus counterparts (Diaz & Cartnal, 1999). The move to on-line pedagogy, with the intent that these offerings cater to the greatest possible variety of learners, has brought yet another array of questions about matching web-based learning environments with the preferred style of the user (Graff, 2003; Logan & Thomas, 2002). All these questions are particularly relevant for learners in universities as they are likely to have been subjected predominantly to verbal and linear forms of communication and some will have developed strategies that conflict with their preferences (Smith, 2002).

The effect of competing inventories

While all the research agrees that different individuals approach learning differently (Renzulli & Dai, 2001; Furnham, 1992), the potential of the research to promote accommodation of diversity has not been realised; a collection of models has not been embraced, nor has 'an encompassing theory of individual differences in learning' (Yates, 2000) emerged. Rather the rivalry between different models, each of which has a particular function and is 'instrument bound' (Sternberg & Grigorenko, 2001), has been plagued by competition, each wanting to become the one 'coherent, consensual view' (Yates, 2000), the single model that is seen as reliable, valid and predictive (Koob & Funk, 2002; Garner, 2000; Diaz & Cartnal, 1999; Riding and Raynor, 1999). As every model proclaims its own superiority and has its own fiercely partisan adherents, they leave no space in which diverse models can co-exist. The resulting lack of 'any common conceptual framework and language for researchers to communicate either with each other or with psychologists at large' has been aptly described by Sternberg (2001) as 'a kind of balkanisation of research groups'.

Thus theories based on learning styles have a problematic relationship with theories in other fields such as cognitive psychology and personality theory (Yates, 2000). Learning theory focuses in a specific and applied way on the act of learning, whereas cognitive theory focuses more generally on the processing of information, although, just to add to the confusion, some use the terms 'learning style' and 'cognitive style' interchangeably (Riding & Raynor, 1999; Sadler–Smith, 2001; Sternberg and Grigorenko, 2001; Logan & Thomas, 2002; Riding & Cheema 1991). Even learning style per se is not an agreed construct. There is a wide range of definitions, many of which contradict each other, and for some 'the construct simply does not exist' (Koob & Funk, 2002). Furthermore, learning styles have an unresolved relationship with personality dimensions and both have a problematic relationship with measures of abilities or intelligence (Renzulli & Dai, 2001; Sternberg & Grigorenko, 2001; Riding & Raynor, 1999; Furnham 1992); this has been recognised as an area where additional research would be useful (Riding & Raynor, 1999). For cultural anthropologists there is also tension between models based on individual 'traits' and the idea of 'repertoires', meaning 'the ways of engaging in activities stemming from … cultural practices' (Gutierrez and Rogoff, 2003). For postmodernists, the idea of culturally constituted 'identity' is posited against the more essentialist notion of personality.

Thus the potential of the research to promote broad and pluralist understandings of diversity within a holistic understanding of education has been compromised by the contest between models for unitrist dominance. It is not surprising that the resulting reductionist application of specific models and learning style stereotyping has been found to be ineffective in pedagogical practice (Gutierrez & Rogoff, 2003; Yates, 2000; Diaz & Cartnal, 1999; Stahl, 1999). Pursuit of simple theoretical models, and the consequent ignoring of context, have the result that 'they 'easily turn into mere rhetoric' (Renzulli & Dai, 2001), based on 'overly static and categorical' results (Gutierrez & Rogoff, 2003). There is as yet little investigation of what each model actually measures (Riding and Raynor, 1999), or how a combination of models and instruments might give a more holistic picture of a student as a learner.

The effect of defining, categorising and measuring diversity

The nature of models and inventories strengthens the tendency of psychometric approaches to promote commonality rather than diversity. The desire for a simple and practical scientific model has driven a tendency to construct models that are concise and comprehensive (Gutierrez & Rogoff, 2003; Entwistle, McCune & Walker, 2001; Riding, 2001; Tyler, 1978). Thus all the taxonomies impose limits on diversity through their attempts to categorise, which by their nature seek areas of commonality. Although Riding and Cheema (1991 in Riding and Raynor, 1999) identified over 30 different labels and models of cognitive style, the tendency has been to reduce the number of identified styles. Thus Dunn and Dunn (1978 in Sternberg and Grigorenko, 2001), who found 18 styles, divided them into 4 main categories – environmental, emotional, sociological and physical. The Honey and Mumford model (1992 in Riding and Raynor, 1999) also uses a four-category taxonomy of activists, theorists, pragmatists and reflectors. Swailes and Senior (1999 in Sadler–Smith, 2001) reduced the outcomes of the Honey and Mumford Learning Styles Questionnaire to three styles: pragmatist, activist and reflector/theorist. Grasha and Reichman's scales (1974 in Riding and Raynor, 1999) are also based on three sets of polarities: participant/avoidant, collaborative/competitive and independent/dependent. Kolb's widely used taxonomy of learning styles offers only two axes: converging/diverging and assimilating/accommodating (Kolb, 1984).

The imposition of categories is intrinsically reductionist because it forces continua to be interpreted as discrete entities. This is counter to authentic recognition of diversity because people vary to degrees and 'the majority … do not represent the extremes' (Yates, 2000); people may even vary between styles from time to time, depending on mood and circumstance. This reductionism is exacerbated where the desire to plot the categories on two dimensional axes results in models that identify oppositional 'types', even though these bi-polar categories exist at each end of a single continuum along and people's preferences will distribute the whole continuum, rather than just belonging to one style or its opposite (Sternberg & Grigorenko, 2001; Riding and Raynor, 1999). This is most problematic if the bi-polar classifications are value-laden in terms of presence or absence of a particular characteristic, or when one label is seen as better than another (Smith, 2002).

Attempts to measure these reductionist dimensions also strengthen the tendency to commonality by attempting the impossible task of obtaining 'a pure measure of one aspect without being confounded by others' (Messick in Renzulli & Dai, 2001); measurement requires at least the illusion that one can segregate one aspect of individual difference and reduce it to something expressed in single normative rankings or scores (Renzulli & Dai, 2001). This is essentially problematic with an organic function like learning, which 'deals with hidden processes that occur inside the brain [that] cannot be identified by direct observation' (Koob & Funk, 2002). The difficulty of measuring any particular aspect of learning affects both the performance-based measures favoured by the cognitive researchers and the self-report measures favoured by the learning style researchers. Performance-based measures cannot separate style preference from ability; learning style's use of 'introspective self-report measures' suffers from subjectivity, bias and variable motivation (Renzulli & Dai, 2001; Riding, 2001). The dominance of the drive towards measurable scales is demonstrated by the fact that 'the shortcomings of the instrumentation', have not led to a rejection of the instrumentalist approach but to seeking to improve 'the psychometric properties of the instruments' (Ferrell, 1983).

While the instrumentalist approach purports to value diversity, authentic appreciation of diversity would require a holistic approach that only uses psychometric instruments with caution, and avoids basing generalisations or teaching prescriptions on their outcomes (Gutierrez & Rogoff, 2003). Such an approach would recognise that the various instruments have quite specific purposes and use them aptly, 'defining the intended use of the data to be collected, matching the instrument to the intended use, and finally, selecting the most appropriate instrument' (James and Gardner 1995 in Diaz & Cartnal, 1999). Such an approach sees the collection of measurable differences 'as a constellation of factors' (Rogoff & Angelillo, 2002 in Gutierrez & Rogoff, 2003), with variable applications within the range of aspects of the educational experience, including physical and emotional environment, expectations of self and others, locus of power, teaching strategies, resources, motivation and feedback (Scott, 2001). Thus statements based on particular observations and situations would be confined to those observations and situations and not extrapolated to other spatial, relational and temporal circumstances (Gutierrez & Rogoff, 2003; Renzulli & Dai, 2001; Logan & Thomas, 2002). Furthermore, the focus would tend to be on patterns of approaches (Gutierrez & Rogoff, 2003) and

relationships rather than individuals in isolation, recognising that even in the same place and time, affective variables can affect outcomes and learning is a social process involving interaction with peers and teachers (Renzulli & Dai, 2001; Lang et al, 1999).

If authentically supporting diversity, psychometric measurement of diversity would only be used as an adjunct to other approaches designed to holistically enhance the accommodation of diversity. The total effect would be to see learning as catering to individual needs, siting 'learners as enterprising, flexible and adaptable individuals, capable of taking responsibility for managing the frequent transitions required by contemporary life' (Harrison, 2001). This philosophical approach appears to be more important than any theoretical labelling in optimising learning for all types of student (Renzulli & Dai, 2001; Trilling & Hood, 2001). A smorgasbord of teaching styles, for example, allows student choice and independence, encouraging them to negotiate their own objectives, and reach them in ways that suit them (Biggs, 2001).

How institutions perpetuate existing norms of learning and teaching behaviour

Self-regulating individualised learning is not, however, strongly supported by educational institutions. Historically, education in state supported institutions has been developed to preserve the status quo through promoting commonality and producing a relatively homogeneous society, using such norm-laden notions as 'aspirations of citizenship' (Rose, 1990). As organs of social control, educational institutions remain more concerned with the aptitudes educators hope to nurture than with the spontaneous aptitudes of the learner (Bruner 1969 in Renzulli & Dai, 2001). This is evident in the philosophical divide between psychology and pedagogy; psychology focuses on the individual learner, while pedagogy tends to focus on the educational context. 'The … system is the given, not the … [learner] or any other component of the system' (Biggs, 2001). Within institutions, accommodating diverse preferences can be dismissed as leading 'to chaos' and taking energy 'that would be better spent on other things' (Stahl, 1999). As universities have broadened their base, they have shifted from training the elite to selecting the elite and teaching the remnant what is required if they aspire to

join the elite. Thus there is a tendency to use the ability to identify diversity to facilitate its modification rather than to cater for it, to promote convergent rather than divergent practice.

The power in the real or virtual university classroom remains with the teacher who sets the curriculum and assesses the students' work; thus the embedded styles of learning and teaching often reflect 'the ways the teachers themselves prefer to learn' (Entwistle, McCune & Walker, 2001). If teachers' approaches are extended by knowledge of difference, the effect of this depends on how they then choose to navigate the space between theory and practice and where they choose to place the locus of power in the learning/teaching relationship (Renzulli & Dai, 2001; Trilling & Hood, 2001). Even the belief that learning should be tailored to individual preferences can still place the locus of control with the teacher, if the teacher diagnoses and prescribes the appropriate strategies or instructional input for each individual (Biggs, 2001; Yates, 2000),

Teachers are usually those who have succeeded in the system so their preferred styles can often be justified as generically preferable because they facilitate learning in current institutions and systems. Following from this justification, knowledge of learning differences can be used to encourage and rationalise commonality in the form of convergence of student behaviour towards effective use of those styles. This promotion of commonality is facilitated and justified for some by arguments that learning styles are not relatively fixed, but are largely environmentally and deliberatively shaped, and can be consciously modified (Sternberg, 2001; Renzulli & Dai, 2001; Zhang and Sternberg, 2000; Riding and Raynor, 1999). This is contested ground (Renzulli & Dai, 2001; Sternberg and Grigorenko, 2001). In particular, it is possible that some styles may be more changeable than others (Logan and Thomas, 2002), or preferred style may only appear to change over time, as a result of other changing variables such as developmental stages (Sadler-Smith, 2001).

Even where styles are seen as relatively fixed, however, development of commonality can still be rationalised through the notion of strategies, 'coping behaviours' (Sadler-Smith 1999), which 'involve a conscious choice of alternatives' (Sternberg & Grigorenko, 2001), 'to make the best of situations for

which the styles are not ideally suited' (Riding and Raynor, 1999). Failure to individualise education can then be justified as being good for the student because it 'will produce a repertoire of learning strategies – a cognitive tool kit' (Riding & Raynor, 1999).

Both the construct of malleable styles and that of strategies shift the onus of accommodating differences in approaches to learning from the teacher to the student. The role of the teacher becomes driving students towards accommodating institutionally preferred learning and teaching styles, either through overt teaching or through the hidden curriculum. Overt practice can include encouraging the use of different learning styles to manage different learning tasks (Riding & Raynor, 1999), using knowledge of styles to diagnose and prescribe required changes for individuals (Biggs, 2001), explicit teaching of different learning styles (Biggs, 2001), and fostering the development of effective strategies to accommodate commonality of teaching approaches (Lang et al, 1999; Riding & Raynor, 1999). Commonality of approach can also be more subtly driven by 'extensive use of an instructional procedure that elicits the style' (Lang et al, 1999), social reinforcement, labelling, curriculum design and/or embedding preferred approaches in summative assessment (Smith, 2002; Renzulli & Dai, 2001; Diaz & Cartnal, 1999).

Social reinforcement is possibly the most subtle of these and can be almost inadvertent. Teacher responses tend to reinforce dominant styles as students whose cognitive style matches those of their teachers will be viewed more positively and evaluated more highly (Smith, 2002). Labelling can also be an insidious way of enforcing norms, because it appears objective and scientific, and is attractive as it allows generalised teaching to address a diagnosed difference, which is 'appealing to teachers who have limited resources, support, or training to meet the challenges of new student populations' (Gutierrez & Rogoff, 2003, 20), which is often the case in the Twenty First Century university. Labelling, is, however, often suspect. It 'can be a self-fulfilling prophecy' (Smith, 2002) and produces a high level of generalisation, which can verge on tautology. Thus we are told: pictoral representations suit imagers, while verbalisers prefer verbal presentations (Riding and Raynor, 1999); wholists like to work in groups, analytics fare best at individual work (Riding and Raynor, 1999). With reference to on-line education, the same symptom appears: the 'wholist-analytic dimension' affects

'the success with which individuals learn from web-based systems' and verbalisers are less suited than imagers to complexly arranged segmented web systems (Graff, 2003). In the most extreme cases, labelling can be used to denigrate approaches to learning as 'unfruitful or even pathological' (Yates, 2000), as when Yates (2000) states 'students who indicate preferences to learn and study in the presence of certain types of popular music are indicating poor study patterns, possible high risk-taking behaviour, and possible emotional disturbance'. This use of labelling is very similar to the judgemental deficit and ability-based models that efforts to research learning styles were ostensibly trying to escape (Sternberg & Grigorenko, 2001). This tendency is even evident in cultural styles work that tries to avoid the deficit model, if the cultural practice of the dominant group is taken as the norm (Gutierrez & Rogoff, 2003).

Assessment tasks can directly or indirectly reinforce styles (Smith, 2002): directly as priority is given to 'the development of the learning skills and competence which students require to succeed on their coursework' (Davies et al 1998 in Briggs, 2000), and indirectly as the student who fails 'is considered to be a poor learner, rather than one who has simply reconfigured or interpreted the problem in a way which is incongruent with that of teacher or observer' (Scott, 2001). Rewarding certain styles of learning, thinking and behaving while failing non-conformists, ensures the continued dominance of the norms, while disguising this discrimination as a measure of generic ability (Sternberg & Grigorenko, 2001; Zhang & Sternberg, 2000; Lang et al, 1999).

Once established, convergence is self-perpetuating. Controlling and normative discourses that blame the students for failure to adapt leave them with two choices. Either they can persist with their own preferred approaches, thereby limiting their effectiveness as learners (Sadler-Smith 1999), or they can 'cling to a familiar way of learning [that] goes against their preferred cognitive style' (Smith, 2002). In either case, the failure to adapt becomes a sorting mechanism, as the students concerned are blamed for their lack of success and described as 'failures' (Briggs, 2000).

This serves the societal goal of homogeneity. It perpetuates the dominant culture by disadvantaging those 'learners who have been educated in a less academic environment before entering higher education, … from lower socio-economic groups, … outside the 'mainstream' white culture, women, and those with disabilities' (Smith, 2002). The effectiveness of this in perpetuating the dominance of hegemonic approaches is evident in Martinez and Munday's (1998) study, in which they found that failure to accommodate learner diversity contributed to student drop-out rates, as two key factors for retention were 'the student's awareness of his/her own learning process and the lecturer's response to the varied learning needs of the group' (Briggs, 2000). Our response to this information brings us back to the original philosophical question. Do we want to facilitate diversity by accommodating divergent learners, or do we want to facilitate homogeneity by ensuring that their failure to adapt weeds them out in a way that also facilitates social control by ensuring that they see their failure as their fault?

Conclusion

The discourse and application of psychometric approaches to learner differences is the subject of both paradox and irony. Paradoxically, the recognition of diversity embedded in psychometric research has had a reductionist tendency, both through confining diversity to a small number of defined 'types' and through trying to contain it within one 'model'.

Ironically, the psychometric discourse of individual difference has promoted commonality rather than diversity, as it has been adapted to support the goals of institutionalised models of education. Universities, as servants of the state and the professions, generally do not embrace pedagogy that optimises the variety of approaches to learning or caters for the maximum range of preferences of individual students. At the same time, they have to appear to accommodate a rapidly growing student base. The necessary illusion of appreciating diversity (while actually sustaining commonality) can be facilitated by quoting psychometric models and testing students with instruments that purport to support appreciation of diversity, even as they aid in its containment.

References

Biggs, J. (2001) Enhancing Learning: A Matter of Style or Approach, in: J.J. Sternberg & L-F. Zhang (Eds) *Perspectives on Thinking, Learning and Cognitive Styles*, (Mahwah, NJ, Lawrence Erlbaum Associates), 73-102.

Briggs, A. R.J. (2000) Promoting Learning style analysis among vocational students, *Education and Training*, 42:1, 16-23.

Diaz, D. P. & Cartnal, R. B. (1999) Students' Learning Styles in Two Classes, *College Teaching*, 47:7, 130-135.

Entwistle, N., McCune, V., Walker, P. (2001) Conceptions, Styles, and Approaches Within Higher Education: Analytic Abstractions and Everyday Experience, in: J.J. Sternberg & L-F. Zhang (Eds) *Perspectives on Thinking, Learning and Cognitive Styles*, (Mahwah, NJ, Lawrence Erlbaum Associates), 103-136.

Ferrell, B. G. (1983) A Factor Analytic Comparison of Four Learning-Styles Instruments, *Journal of Educational Psychology*, 75:1, 33-39.

Foucault, M. (1988) The Political Technology of Individuals, in: L.H. Martin, H. Gutman & P. H. Hutton (Eds) *Technologies of the Self* (London, Tavistock Publications), 145-162.

Furnham, A. (1992) Personality and Learning Style: a study of three instruments, *Personality and Individual Difference*, 13:4, 429-438.

Garner, I. (2000) Problems and Inconsistencies with Kolb's Learning Styles, *Educational Psychology*, 20:3, 341-8.

Garton, B. L., Spain, J. N., Lamberson, W. R. & Spiers, D. E. (1999) Learning Styles, Teaching Performance, and Student Achievement: a relational study, *Journal of Agricultural Education*, 40:3, 11-20.

Goffman, E. (1961) *Asylums* (New York, Anchor).

Graff, M. (2003) Learning from web-based instructional systems and cognitive style, *British Journal of Educational Technology*, 34:4, 407-418.

Gutierrez, K.D. and Rogoff, B. (2003) Cultural Ways of learning: Individual traits or repertoires of practice, *Education Researcher*, 32:5, 19-25.

Harrison, R. (2001) Records of achievement: tracing the contours of learner identity, in: C. Paechter, R. Edwards, R. Harrison & P. Twining (Eds) *Learning, Space and Identity* (London, Paul Chapman Publishing/Open University), 155-166.

Kolb, D. A. (1984) *Experiential Learning: Experience as a Source of Learning and Development* (Englewood Cliffs, NJ, Prentice Hall).

Koob, J. J. and Funk, J. (2002) Kolb's Learning Style Inventory: Issues of Reliability and Validity, *Research on Social Work Practice*, 12:2, 293-308.

Lang, H. G., Stinson, M. S., Kavanagh, F., Liu, Y. & Basile, M. L. (1999) Learning Styles of Deaf College Students and Instructors' Teaching Emphases, *Journal of Deaf Studies and Deaf Education* 4:1, 16-27.

Logan, K. & Thomas, P. (2002) Learning Styles in Distance Education Students Learning to Program, in: J. Kuljis, L. Baldwin & R. Scobie (Eds) *Proceedings of the Psychology of Programing* (Brunel University, Interest Group 14), 29-44.

Maslow, A. H. (1970) *Motivation and Personality*, (New York, Harper and Row).

Renzulli, J. S. & Dai, D. Y. (2001) Abilities, Interests, and Styles as Aptitudes for Learning: A Person-Situation Interaction Perspective' Styles, in: J.J. Sternberg & L-F. Zhang (Eds) *Perspectives on Thinking, Learning and Cognitive Styles*, (Mahwah, NJ, Lawrence Erlbaum Associates), 23-46.

Riding, R. & Cheema, I. (1991) Cognitive Styles: An Overview and Integration, *Educational Psychology,* 11:3/4, 193-215.

Riding, R. and Raynor, S. (1999) *Cognitive Styles and Learning Strategies* (London, David Fulton Publishers).

Riding, R. (2001) The Nature and Effects of Cognitive Style, in: J.J. Sternberg & L-F. Zhang (Eds) *Perspectives on Thinking, Learning and Cognitive Styles*, (Mahwah, NJ, Lawrence Erlbaum Associates), 47-72.

Sadler–Smith, E. (2001) Does the Learning Styles Questionaire Measure Style or Process? A Reply to Swailes and Senior (1999), *International Journal of Selection and Assessment*, 9:3, 207-214.

Rose, N. (1990) *Governing the Soul* (London, Routledge).

Sadler–Smith, E. (1999) Intuition-Analysis Style and Approaches to Studying, *Educational Studies*, 25:2, 159-173.

Scott, D., (2001) Situated Views of Learning, in: C. Paechter, R. Edwards, R. Harrison & P. Twining (Eds) *Learning, Space and Identity* (London, Paul Chapman Publishing/Open University), pp 31-41.

Smith, J. (2002) Learning Styles: Fashion Fad or Lever for Change? The Application of Learning Style Theory to Inclusive Curriculum Delivery, *Innovations in Education and Teaching International*, 39:1, 63-70.

Stahl, S.A. (1999) Different strokes for different folks: A critique of learning styles, *American Educator*, Fall, 1-5.

Sternberg, R. J. (2001) Epilogue: Another Mysterious Affair at Styles, in: J.J. Sternberg & L-F. Zhang (Eds) *Perspectives on Thinking, Learning and Cognitive Styles*, (Mahwah, NJ, Lawrence Erlbaum Associates), 249-252.

Sternberg, R. J. & Grigorenko, E. L. (2001) A Capsule History of Theory and Research on Styles, in: J.J. Sternberg & L-F. Zhang (Eds) *Perspectives on Thinking, Learning and Cognitive Styles*, (Mahwah, NJ, Lawrence Erlbaum Associates), 1-22.

Swailes, S. and Senior, B. (2001) The Learning Styles Questionnaire: Closing Comments? *International Journal of Selection and Assessment*, 9:3, 215-6.

Tyler, L.E. (1978) *Individuality* (San-Francisco, Jossey-Bass).

Trilling, B. & Hood, P. (2001) Learning, technology, and education reform in the Knowledge Age in: C. Paechter, R. Edwards, R. Harrison & P. Twining (Eds) *Learning, Space and Identity* (London, Paul Chapman Publishing/Open University), 7-30.

Yates, G.C.R. (2000) Applying learning style research in the classroom: some cautions and the way ahead, in: R.J. Riding & S.G Rayner (Eds) *International Perspectives on Individual Differences*, Vol. 1, (Stamford, Connecticut, Ablex Publishing), 347-354.

Zhang, L-F. & Sternberg, R. J. (2000) Are Learning Approaches and Thinking Styles Related? A Study in Two Chinese Populations, *The Journal of Psychology*, 134: 5, 469-489.