

Disaffection with School Mathematics, Gareth Lewis – Sense publisher – ISBN978-94-6300-329-2

Final Draft

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The motivation for this book comes from years of teaching mathematics and the author's empathy with young people's perspectives is evident throughout its pages. It is certainly not a teaching guide; instead it chronicles a turn towards theory as a means to grapple with the idea of 'disaffection'. Specifically Lewis proposes reversal theory, a psychological framework for investigating the ways that motivation is experienced, in order to understand the complexity of young people's relationships with mathematical work. After identifying and interviewing a range of young people who are disaffected with school mathematics, the author argues for more attention to 'playfulness' in mathematics lessons at all levels, and suggests that this finding would not have emerged from other analytic frameworks. The book proposes three contributions to the debate: a detailed description of disaffection that takes account of its mutability and variety; a critique of other theories of motivation (specifically Dweck's mindsets theory and self-determination theory) and the argument for seriously considering playfulness as a factor in planning for learning.

Paying some critical attention to disaffection in mathematics is a worthwhile endeavour, not because there is any lack of education research showing that young people report feeling turned off by mathematics but because these findings have such a strong currency amongst policy makers, teachers and parents seeking to make a change in young people's lives. Studies of school disaffection have a historical grounding in cultural theory such as Paul Willis's sociological characterisation of school resistance as deliberate acts of competing working-class culture (Willis, 1990). Such studies have taken substance from a moral panic engendered by disruptive behaviour, and established a discourse in which disorderly youth are defined as the 'other' to educational and civic engagement, with the concern being psychologised by being located in 'attitude' rather than social class (Swann, 2013). From another perspective, disaffection has been studied as a rational response to disadvantage, analysing the ways in which educational settings fail to meet the needs that result from students' social and economic settings. This book introduces itself by examining this conflation and its opening quote shows how a public recognition that students are too often bored in classrooms can escalate into a fear of young people's truancy and bad behaviour. This is, however, the only discussion of the social framing of disaffection within the book, which continues with a purely psychological perspective. Interestingly, boredom - an emotion that is central to this study - is recognised at school in ways that do have complex intersections with class: for a middle-class child, boredom can be taken to indicate intelligence; for a working class-child, boredom can indicate failure to connect with school goals. (Perhaps this very complexity permits the author to assume a neutral stance to the sociological implications of judging whose affect is or is not engaged?). Despite the policy concerns rehearsed as a justification, the study is not really an attempt to explain the

impact of affect on students' behaviour or learning, but instead sets out on a more fundamental level to chart the emotional experiences of disaffection in learning and how they arise.

The book presents the arguments and data from the author's doctoral study and reflects that academic structure. The first chapter tackles the significance of disaffection as detrimental to young people's educational performance and wellbeing, and ultimately to national prosperity and social cohesion. The evidence base for this concern in England is familiar, inspired mainly by Nardi and Steward's (2003) finding that 11-14 year olds were quietly disaffected by teaching that reduced mathematics to execution of a set of teacher-explained rules. In this chapter we also meet some of the theoretical questions that underpin the whole book: how to characterise disaffection, and how to investigate its relation to motivation and to emotions such as anxiety, boredom or tranquillity. Early on, we are offered a working definition of disaffection as "prevailing negative affect that disables or inhibits learning" (p9). This makes the assumption that affect and cognition are co-dependent aspects of pupil experience, so that disaffection inhibits learning, and this reasonable assumption holds through the rest of the book.

Chapters Two and Three develop the main theoretical discussion concerning the relationship of affect, motivation and emotion. From a theoretical perspective, we are told that disaffection "manifests itself across a range of affective constructs: motivation, emotion, beliefs (about self and about mathematics) and attitudes" (p9). Chapter Two offers a review of relevant psychological literature in mathematics education, tackling the differences in how key authors such as McLeod, Hannula and Goldin trace the relationship between affective constructs. This is a challenging read without a background in psychology, because it refers to nuanced differences between theoretical positions before outlining any areas of agreement or indicating what will be central to developing its own argument. In the end, it was not necessary to grasp the detail to find the rest of the book thought-provoking and Chapter 14 helpfully reviews key theoretical points in relation to the data presented.

The main theoretical discussion is about the place of motivation in the landscape of affect. It starts by considering arguments that motivation is a quality of the drive possessed by an individual that provides the source for action, modified perhaps by context? Lewis critiques this approach as simplistic but points out how often writing reverts to it. The second approach takes motivation as stemming instead from a person's attitudes and beliefs, for example about whether it is important to understand mathematical concepts or to obtain good test results, whether failure is heralded as part of learning or to be avoided? Dweck's distinctions of performance and mastery-goals are offered as an example. Cognition and self-regulation are here seen as prior to developing motivation, while emotions are the outcomes of experience and Lewis critiques their often simplistic characterisation as binary (positive/negative) or quantifiable. A third possible position is that motivation is derived from a mixture of external rewards and more effective, intrinsic needs. This is suggested by self-determination theory which proposes competence, autonomy and relatedness (belonging) as our three basic needs. Lewis finds the intrinsic/extrinsic distinction problematic to operationalise and argues that the three basic needs omit the complexity of relating pleasures to needs. Finally the author introduces the position he adopts: that motivational states are tied to emotions and, together, these underpin how affect is experienced and how attitudes and beliefs develop. Alongside this is a second discussion of the timescale of disaffection, and how different theories allow for the co-existence of stable traits and/or transient states within motivation.

The author's chosen theory is set out briefly in Chapter Three as Reversal Theory (RT) : "an account of personality, motivation and emotion". There is little background justification for the basis of the phenomenological RT framework proposed; rather the book is presented as a novel application of RT to the field of mathematics education. Essentially RT appears to derive from accounts of subjective experience and offer a structure of relationships and transitions between a wide range of motivational states and their associated emotions and actions. The theoretical starting point is that there are four motivational domains that influence emotions, of which one or two are focal at any time. The first is most familiar: motivation as 'purpose' or goal-seeking. There are two contrasting states within this domain, telic (serious) and paratelic (playful), and it is expected, even healthy, for people to 'reverse' between these states, perhaps many times within the duration of an activity. The other three domains, which also permit reversals, concern 'rules' - whether one feels conforming or rebellious to socio-cultural expectations ; 'transactions' - how one reacts with people, feeling sympathy or competition; and 'relationships' - whether one prioritises separation or belonging. Different pairings of these focal states are mapped to a set of named emotions, modified by the intensity of the experience (high/low arousal ) and its hedonic tone (unpleasant/ pleasant). For example a student in a serious-conforming motivational state may experience the emotions of anxiety (unpleasant , high arousal) or relaxation (pleasant, low arousal). If I follow the author's reasoning, then pleasant, high arousal emotions are not experienced in a serious-conforming motivational state: instead a reversal introduces a playful-conforming state that is characterised as excitement. The unpleasant, low-arousal emotion associated with the playful-conforming state is boredom, central to disaffection.

The explanation of theory left me with many questions about why certain domains and combinations were explored and not others, or why and when some emotion-states prompt reversals. For instance, as suggested above, the emotion of excitement is not associated with a serious-conforming state, and yet later we meet students whose experience of "working away" is described as being 'in flow', which feels to me to be purposeful/serious as well as playful. Nor is there an option of reversing to a highly-aroused, pleasant, serious but *rebellious* state, that I imagine as defiantly proving everyone wrong. The framework is presented as a neat, restricted set of states and their combinations so it seems reasonable to expect that there is some comprehensive, overall explanatory account, but that is lacking here. I could not ascertain whether the author was being selective in illustrating only certain aspects of reversal related to this context, or whether the theory is less neat or comprehensive than is suggested. I suspect it is partly the latter, given that the author points out the developing and phenomenological nature of the theory and offers a critique that RT lacks testability. As a theory, it has arisen empirically from considering which emotions and reversals do occur in goal-directed contexts and so it focuses on those interactions that occur most commonly and may have little to say on others. What the RT theory does provide is an 'adequately robust' rationale for the author to organise data around 16 key emotions and posit certain connections between them that relate to motivational states, pleasure and arousal. This permits an interpretation of data collected through surveys and interviews investigating the emotional states experienced by young people while learning mathematics. His analysis considers the evidence indicating which motivational domains are focal, which emotions the students experience and in what situations reversals occur. The commonalities between the states students experience and the ways they move between them are presented as patterns of disaffection.

Chapters Four and Five explain the data collection and instruments that were used to map patterns of disaffection across one whole school year group of English 13/14-year olds and to identify notably disaffected students from within two cohorts of English 16/17-year olds. Chapters Six to Twelve then introduce case-by-case analyses of selected students, all but one chosen because they reported frequently feeling the 'disaffection' emotions such as stress, boredom or anger. The 16/17-year old students interviewed had already failed at least once to achieve the threshold mark in a high-stakes mathematics qualification after which mathematics is no longer compulsory. They were thus required to retake the qualification in a different school setting and all felt some chance of passing this time around, so that their disaffection could be distinguished from their self-efficacy.

The case studies introduce us to students' "life histories" of "me and mathematics" via a thoughtful and heartfelt commentary. We meet a selection of characters whose stories would be familiar to secondary mathematics teachers and researchers: frank accounts that encompass the lows and occasional highs of mathematics learning experiences. One poignant episode is a teenager's recollection from primary school of progressively recognising the feeling that it was easier to switch off from trying to understand the mathematics rather than disappoint, even frustrate, the teacher and peers by asking for yet another explanation. Reading through these chapters I found myself asking how the RT framework was needed for the interpretative commentary, which ranges over emotions, causes and contextual factors. On reflection, there is an underlying method of articulation achieved by highlighting interactions between the four RT domains of purpose, conformity, sympathy/mastery and self/others. The framework does offer some lines of organisation while retaining the complex idiosyncrasy of lived experience.

Chapters 13 to 15 round off by identifying patterns in the landscape of disaffection, explicitly drawing on categories from the RT framework. Notable for me was the evidence of the effort made by these students, from which the author argues that they are disaffected without being disengaged. Affect is shown to be volatile and responds to learning environment. The majority of students report long-term, strong negative emotions about mathematics but these could be lightened by clearly positive experiences. Sometimes these experiences extended over a full year and were ascribed to effects such as having a different teacher or finally understanding fractions, and sometimes they were focussed on a single lesson where a test was passed or the student that they'd "actually finally learnt it and got the hang of it" (p104). There is indeed, as the author suggested, little evidence in these accounts that it is useful to differentiate between 'extrinsic' rewards of praise or test results and 'intrinsic' rewards of understanding. Lewis also questions what he finds to be a common understanding – that disaffected students lack effort or the self-regulatory skills to overcome a challenge. Instead these students show determination and some sophistication in managing their emotions: forestalling distractions, tolerating frustration, isolating themselves from comparisons with others, finding outlets for frustration and anger, and scheduling collaborative or revision activities to minimise boredom. The self-regulatory effort involved in these – sometimes unsuccessful – practices is neatly described and allows the author to challenge interpretation of Dweck's work that identifies disaffection with an entity view of intelligence.

The book expands on students' transitions between emotions, and there are some fascinating insights: choosing to help others as a move away from frustration and towards arousal, mastery and playfulness; the role of the caring teacher; the observation that students' descriptions of pleasurable relaxation and excitement in mathematics are very similar, with little indication of changed arousal.

These findings combine in the closing argument for more attention to paratelic motivation in learning and teaching mathematics. The author draws attention to the students' repeated search for playful activities, and suggests that this motivational need is neither trivial nor "an add-on that makes difficult tasks more palatable" (p158). Given that students will often be in a playful-conforming state he laments that neither they nor the mathematics education community have a language or the framework to discuss the importance of paratelic engagement. The last chapter offers suggestions of pedagogic practices for playful engagement that accompany those that drive achievement. For example, in the usual form of teaching that emphasises serious engagement, the author points to two aspects that are crucial to motivation: developing a narrative of significance and experiencing satisfaction. He recommends that teachers develop such a narrative by rehearsing explanations of the meaning and purpose of the topic, and including non-mathematical applications. In relation to satisfaction, he suggests that lessons with a sequence of short tasks mean that the satisfaction of achievement is a temporary and low- arousal emotion. In contrast, mathematical activities that are framed as games, that use novel presentations, that set intriguing questions or in which students can help each other and be helped, provide a climate that meets the students' motivational needs for immersion, mastery/winning and sympathy.

The author suggests that this book can be read as an attempt to understand disaffection during which theoretical innovation proved necessary. The book is indeed successful in providing an explanatory commentary on young people's motivations and emotions in learning mathematics, and concludes with some well-argued recommendations on motivational climate. It is less successful as an engagement with theory, perhaps because it aims to summarise its academic argument in a short amount of space. It does give enough detail so that the interested reader could read further, and by the end I could appreciate how the author was using his theoretical constructs even if I did not how they came about. This book demands work from the reader, not least a critical acquiescence with its theoretical position, but the thoughtful rebalancing of pedagogic attention to include the serious and the playful, goal-seeking and self-care, is a contribution that teachers and the mathematics education community will appreciate.

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