

Understanding developmental psychopathology in Type 1 diabetes through attachment, mentalization and diabetes distress

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Funding sources

C.G.'s PhD Fellowship was funded by Novo Nordisk UK Research Foundation Trust. P.F. is in receipt of a National Institute for Health Research (NIHR) Senior Investigator Award (NF-SI-0514-10157), and was in part supported by the NIHR Collaboration for Leadership in Applied Health Research and Care (CLAHRC) North Thames at Barts Health NHS Trust. The views expressed are those of the authors and not necessarily those of the NHS, the NIHR, or the Department of Health and Social Care.

Competing interests

C.G. has received honorarium from Medtronic for educational activities. K.I. has received honorarium from Eli Lilly, Novo Nordisk, Sanofi and Janssen for educational activities. There are no other conflicts of interest involved with this work.

Abstract

This article examines the combined roles of attachment, mentalization and diabetes distress in the psychological development of young people with Type 1 diabetes (T1D). We use these ideas to unify the evidence for psychological variables affecting young people and their families and suggest how diabetes distress and mentalization might be part of the pathways for development of psychiatric diagnoses.

Attachment theory's central hypothesis is that a secure relationship with a care-giver in the early life of a child is essential to normal emotional and relational development, whilst diabetes distress is a well recognised phenomena of burden experienced by both child and parent in relation to the condition.

We extend the ideas of attachment, into the psychological adaptation processes for young people at the time of diagnosis of T1D with emphasis on the function of the parent/caregiver in mentalizing the experience of the child. We also connect our current understanding of diabetes distress to the associated increased risk for disorders of eating and personality in T1D.

Using principles learnt in other areas of psychotherapeutic practice we end by suggesting interventions that could impact mental health and diabetes outcomes using the mentalization model.

Word count: 190

Introduction

Type 1 diabetes (T1D) is an autoimmune condition, characterised by an almost complete lack of insulin production and approximately half of people present before the age of 18 years (Daneman, 2006). Exogenous insulin therapy is the cornerstone of self-management, which not only controls the symptoms of high plasma glucose, but also reduces risk of long-term complications including renal failure, blindness and myocardial infarction (DCCT, 2016; (DCCT & Group, 2015). The most effective treatment regimens are those approximating the natural pattern of insulin production, background insulin to control endogenous glucose production and insulin boluses to cover carbohydrate intake. Ideally people with T1D should be trained through structured education to adjust their rapid acting insulin depending on carbohydrate content of meals, current plasma glucose and other factors such as exercise or illness (Elliott et al., 2014).

In addition to the substantial physical complications that potentially beset people with T1D, there is an established and growing evidence base of mental health being impacted by the condition. Depression is up to three times more frequent in T1D (Roy & Lloyd, 2012). Developmental conditions associated with difficulty in emotion regulation such as Borderline personality disorder (BPD) and Bulimia Nervosa (BN) are twice as common at follow-up of young people with T1D diagnosed before the age of 18 years, suggesting that an aspect of psychological development is affected by the imposition of the condition (Dybdal et al., 2018). People with mental health problems and T1D are more likely to struggle with self-management and have significantly higher morbidity and mortality (Gonzalez et al., 2008; Park, Katon, & Wolf, 2013). In addition to psychiatric classifications, the significance of the specific emotional burden of living with and managing diabetes has been increasingly recognised and codified as an entity referred to as 'diabetes distress'. Questionnaires developed for measuring 'diabetes distress' focus on cognitions particular to different aspects of diabetes including emotional support, clinical management, impact on social life and eating habits. The significance and complexity of 'diabetes distress' has grown in the last decade. People with higher amounts of 'diabetes distress' appear to have a decline in glycaemic control over time and the association between depression and chronic hyperglycaemia appears to be mediated by 'diabetes distress' (Fisher et al., 2010; Hessler et al., 2017). However, 'diabetes distress' also appears to be associated with the degree of difficulty a person has with emotion regulation and could therefore be a marker of a person's capacity to cope with the emotional burden of diabetes (Fisher et al., 2018). In addition, it is also recognised that 'diabetes distress' extends beyond the person with T1D to parents of children with T1D (Helgeson, Becker, Escobar, & Siminerio, 2012).

In research terms, 'diabetes distress' has tended towards a cognitive model with different domains of distressing thoughts about diabetes. However, much of 'diabetes distress' is likely to be derived from the arousal experienced through the acute response to the life threatening condition, which becomes modulated over time to the experience of a chronic threat. This is particularly important when considering attachment system mechanisms for down-regulating arousal.

We use attachment theory, with emphasis on mentalization, to unify the rich research evidence base on variables affecting outcomes of young people (and their families) living with T1D. This broad approach is used to explain the potential interplay of 'diabetes distress' and mentalization and impact on developmental psychopathology and increased risk for psychiatric disorders. We use this to posit potential psychotherapeutic approaches to interventions tailored for the context of T1D.

Attachment theory

Attachment theory concerns a body of developmental and clinical observations and research focusing on the core principal that a consistent and emotionally available caregiver is key to a child's normal emotional and social development. Initially Bowlby emphasised the bio-psycho-social nature of the construct, aiming to explain, in evolutionary terms, an infant's need for proximity beyond the primary caregiver's function of protector (Bowlby, 1977). He also hypothesized that a parent influences developmental psychology and psychopathology through his or her physical and emotional availability and the laying down of internal working models of relationships.

Ainsworth developed these ideas further through the Strange Situation Procedure with the hypothesis that young children have attachment behaviours that can be elicited in standardised scenarios around the presence and absence of the caregiver (Ainsworth & Bell, 1970). Underpinning this is the notion that these behaviours emerge as strategies to manage arousal in relation to the degree of sensitivity from the caregiver to the child's needs. In the experiment the child is exposed to different experiences, initially in a room with their caregiver, then with caregiver and stranger, then with stranger alone and then by themselves. The traditional analysis is that behaviours in each context are coded then summarised as an understanding of the child's pattern of attachment behaviour: A) anxious-avoidant, B) secure, C) anxious-ambivalent/resistant and D) disorganised. The secure child (B) plays freely and explores while the caregiver is in the room in the knowledge that they have their secure base to return to, they are upset when the caregiver leaves and pleased

when they return. The anxious-avoidant (A) child will not explore whether the caregiver is present or absent and does not express much emotion either on caregiver's departing or return. The anxious-ambivalent/resistant (C) child is distressed before separation, clingy and does not easily settle on the caregiver's return. The disorganised child (D) does not have a consistent way of responding to the caregiver, sometimes presenting with elements of body posturing that imply distress, but at other times implying avoidance.

Subsequent to this the adult attachment interview (AAI) was developed to assess an adult's representations of their attachment relationships (George, Kaplan, & Main, 1985). The traditional analysis again uses four classifications: dismissive, preoccupied, autonomous and unresolved, which are thought to extrapolate respectively from the avoidant, resistant, secure and disorganised classifications of the strange situation procedure. The interview consists of a series of questions designed to elicit information about the individual's experience of attachment relationships during childhood and their reflections on how these experiences have affected their present day functioning. Emphasis is placed on the degree of coherence in the retelling of experiences. Interviewees deemed autonomous at assessment exhibit a degree of balance and understanding towards their caregivers, are coherent and believable. Those deemed preoccupied at interview demonstrate unresolved anger and are at times overwhelmed by the topic of attachment. Dismissive interviewees are divorced from the emotional impact of attachment relationships and play down the importance that attachment relationships may play or continue to play.

Later investigators have used self-rating tools built on the premise of current experiences of romantic relationships as the core way of understanding the person's attachment. These tools use a model based on two continuums: attachment anxiety, a model of the self, and attachment avoidance, a model of others with 4 sub-groups secure, preoccupied, avoidant and dismissive (Bartholomew & Horowitz, 1991; Sibley, Fischer, & Liu, 2005). Although these 4 groupings have similarities to the AAI, they do not have a specific category for those deemed unresolved in the AAI and they sub-divide people deemed avoidant in the AAI into those with a positive outlook on themselves (dismissive) and those who do not (avoidant).

The degree to which childhood attachment can predict adult attachment and the extent that attachment behaviours are conveyed from generation to generation has been extensively investigated and is yet to be resolved. In their review of the current state and potential future direction of attachment research, Fearon and Roisman offer a critique of the taxonomy of attachment behaviours, the degree to which they are influenced by genetics and extent to which they are carried forward from childhood through to adulthood (Fearon & Roisman, 2017). An important aspect they highlight is the revision of the understanding of the

categorical nature of attachment to one where avoidant attachment and resistant attachment are better considered as continuous, weakly associated variables with disorganisation being part of the resistant spectrum. Although these aspects of attachment theory are still to be resolved, the core principle of the availability of a responsive caregiver for many domains of adult functioning has been demonstrated by countless studies. In particular, the availability of an adult the child can rely on appears particularly important for adult functioning in the presence of potentially traumatic adverse childhood experiences (ACEs). For example, in a study examining health harming behaviours, the prevalence of any two of poor diet, daily smoking and heavier alcohol consumption was 21.5%, if the individual as a child had 4 or more adverse experiences and was lacking 'always available adult support' (AAA) but this was reduced to 7.1% if such support was available (Bellis et al., 2017). Similarly, lower mental well-being was 3.27 times more likely with ≥ 4 ACEs and AAA support from someone trusted being available in childhood compared with no ACEs, but this increased to 8.32 times more likely with ≥ 4 ACEs but without AAA support in childhood.

Alan Sroufe and colleagues have detailed the attachment presentations of over 200 children from 1970s onwards (Sroufe, 2005). Over time they have plotted the evolution of attachment statuses, using live observation, videotape and participant ratings, assessing at multiple life stages and tracking influence of multitude of variables including child temperament, parental sensitivity and latterly the influence of peers. Importantly, their work supports Bowlby's hypothesis that children with secure attachment at 12 and 18 months were more likely to become independent later in their childhood and conversely, anxious and resistant children were later rated more dependent. Furthermore, their evidence supports Bowlby and Ainsworth's position that secure attachment is the foundation for emotion regulation later in life, which they hypothesize as a dyadic capacity emanating from the attachment relationship (Sroufe 1989). Following on from this, Fonagy and colleagues have investigated the specific psychological functions that develop within attachment relationships and which may suffer if the child is deprived of an experience of secure attachment which could play a part in the cognitive and emotional challenges the individual faces as an adult (Luyten, Campbell, Allison, & Fonagy, 2020). Through this the concept of mentalization rooted in attachment has developed. For example, evidence has accumulated that the child's skill at understanding, labelling and managing its emotions develop via the caregiver's capacity to imagine (mentalize) the child's emotional state and through mirroring and responding appropriately the child's capacity for emotion regulation develops (Fonagy & Luyten, 2018). The child develops a capacity to imagine mental states in themselves and others in the context of attachment relationships and this capacity will be critical in enabling them to develop appropriate interpersonal skills and manage how they respond to stressful social

experiences which none of us are protected from. Without the experience of responsive parenting, the child's mind remains in a sense socially isolated. Mentalizing provides the skills and competencies to fully understand the actions of others or indeed process their own experiences in new and sometimes distressing situations, such as pain or sickness but also adequately process distress, sadness and anger.

When mentalizing is ineffective because of limited competence in regulating emotional experience, the self and social understanding can become dominated by unhelpful modes of thinking such as *psychic equivalence* where the subjectivity of self-experience is not recognised and the individual is convinced that what they feel is how it is, internal experience equates to the reality of the external world - where a thought is not questioned but concretely experienced as true (Bateman & Fonagy, 2006). Another inadequate mode of mentalizing is the *pretend mode*. In this case, the mind evokes a sense of an emotional state that is split off, where reported experience appears to belie the true feelings of the individual. The third kind of inadequate mentalizing manifests in *teleological functioning* where a person expresses their feelings or gets a sense of influencing another person's mental state only through action. Sometimes such behaviour is regarded as manipulative, which ascribes malevolent intent to actions rooted in limitations of emotional functioning.

Adding to these ideas, Fonagy and colleagues have further described a critical component of social learning, epistemic trust, which is a further historic legacy of the quality of early attachment. Epistemic trust refers to the willingness to consider new knowledge as generalizable, trustworthy and relevant to the self, dependent on the quality of the relationship with the person who presents the information (Fonagy & Allison, 2014). Through this notion, they suggest that it is the attachment relationship, which mediates the taking on or disavowal of new information. Epistemic mistrust will not disrupt cognitive understanding but will prevent the person feeling that information is relevant to them so should be acted on in contexts other than the immediate social situation. This is an aspect of therapeutic relationships and in the absence of epistemic trust the path for therapeutic change can be stymied.

Several studies have investigated the significance of adult attachment relationships on T1D self-management, mostly using standardised self-rating questionnaires as measure of attachment in romantic relationships and HbA1c as marker of self-management (Attale et al., 2004; Bazzazian & Besharat, 2012; P. S. Ciechanowski, Hirsch, & Katon, 2002) or a treatment adherence questionnaire (Turan, Osar, Turan, Ilkova, & Damci, 2003). All four of these studies indicate a negative association with secure attachment, i.e. low attachment anxiety and low attachment avoidance were associated with lower HbA1c or greater

adherence to treatment. In short, attachment security appears to be associated to better self-care of T1D. However, the significance of the different patterns of insecure attachment varied across the studies. In their cross-sectional study of adults with T1D, Ciechanowski and colleagues found that people with high attachment anxiety and high attachment avoidance for adult romantic relationships had significantly higher HbA1c levels, more medical conditions and more diabetes complications compared with people with secure attachment (Ciechanowski et al., 2002). However, with a similar methodology Attale and colleagues found high attachment anxiety and low attachment avoidance was positively correlated with HbA1c, whilst there was no significant difference for the other patterns of insecure attachment (Attale et al., 2004). Echoing these findings in adults, a further cross-sectional study of children with T1D aged 8 to 12 years and their mother's found that attachment security in children was inversely associated with glycaemic control (Costa-Cordella, Luyten, Giraud, et al., 2020). However, maternal attachment avoidance (also measured using an adult romantic relationships questionnaire) was inversely associated with glycaemic control in boys but not girls, suggesting different diabetes behavioural responses to the mother-child dyad. Although these studies begin to indicate some associations in this area of research, they are all cross-sectional in design and have limited adjustment for confounders such as depression and socioeconomic status, which are associated with hyperglycaemia. In the adult studies they also presuppose that it is the therapeutic relationship per se that influences glycaemic control, whereas other aspects of attachment, including mentalization, are also potentially at play.

Family functioning and outcomes in T1D: is attachment theory a unifying factor?

There is a substantial body of research detailing the complex relationships between T1D, family functioning and outcomes. For example, in a review paper Wysocki and Greco presented the consistent empirical evidence on the influence of parental support for the young person on self-care behaviours and glycaemic control (Wysocki & Greco, 2006). However, in the opposing direction Fornasini and colleagues reviewed the literature of the impact that T1D has on family life, highlighting key themes across 29 studies including the emotional impact of the diagnosis on a family, influence on family routines and the problematic task of handing over autonomy to the young person (Fornasini, Miele, & Piras, 2019). Furthermore, Christin and colleagues found significant impact of a chronic physical condition, such as T1D, on the parent-child relationship per se (Christin, Akre, Berchtold, & Suris, 2016). In a systematic review, parenting stress (akin to diabetes distress) was

associated with lower adaptation to a chronic health condition over time for both parent and child and did not correspond to illness duration, suggesting inherent aspects of the parent-child dyad were key to psychological and physical health outcomes (Cousino & Hazen, 2013).

The established vital elements in diabetes adaptation and outcomes of parental support, parental diabetes distress, family adaptation, young person's diabetes distress, young person's adaptation and physical outcomes (generally measured through glycaemic control) can all be seen through the prism of attachment relationships, mentalization and epistemic trust. When the T1D arrives in a family's life it is within an already established and evolving system of attachment relationships. Each parent has competencies in mentalization, often rooted in their own early experiences with caregiver(s) and the young person, depending on age, will also have a degree of mentalization competency and their own idiosyncratic attachment behaviours in balance with their caregiver's sensitivity and availability. In addition, the degree of epistemic trust in both parent and child will affect the flow of information from clinical staff to parent and from parent to child, which is highly relevant given the degree of information necessary to adapt to glucose testing, carbohydrate counting and insulin use. High levels of epistemic mistrust (vigilance) may be compatible with good apparent cognitive understanding but a lack of generalisation to situations outside the clinical consultation leading to limited adherence. For example, a person experiencing a hypoglycaemia episode who doesn't follow usual guidance by treating with easily absorbable glucose because 'I trust my own experience' (over the advice of others).

Depending on the degree of illness in the young person at T1D presentation, they may find themselves admitted acutely unwell or be sent home after explanation of diagnosis having initiated insulin self-management to return shortly for outpatient follow-up. A parent in these differing circumstances will be affected by mentalizing capacity. Mentalization will help manage their own 'diabetes distress' through appropriate labelling of grief and upset (Lowe, Gregory, & Lyne, 2005). It will enable their ability to recognise their child's degree of 'diabetes distress' and their capacity to contain and label what is happening emotionally for their child. It will also potentially affect glycaemic control via consistent emotion regulation allowing for adoption of new health behaviours such as glucose testing and insulin management. This last possibility has already been investigated by Costa-Cordella and colleagues who studied the influence of mentalization in mother's and their son's between age 8-12 and found that a mother's mentalizing capability was strongly associated with their child's glycaemic control (Costa-Cordella, Luyten, Cohen, Mena, & Fonagy, 2020).

For a child, their mentalizing capacity in the short-term could be considerably hampered by the arousal of acute 'diabetes distress' and its impact on emotion regulation and mentalization (see Figure 1). However at both early stages and as time develops, the nature of the attachment relationships will likely influence how much a child uses the attachment figure for emotional support and information (akin to parental support) Furthermore, 'diabetes distress' will also affect mentalizing capacity in the caregiver and how they use their own attachment figures, whether partner or relatives, and one can postulate a 'perfect storm' where both child and parent are significantly impacted, affecting relational functioning throughout the family system, and adaptation to the new condition may become problematic. When hyper-activation of the attachment system occurs the child may become highly reliant on their parent and struggle to become autonomous with diabetes management. Where as, if hypo-activation occurs a child may become excessively independent and disavow their need of others or for that matter, the importance of diabetes itself or, where epistemic trust is concerned, the use or relevance of available information. In both these states one can appreciate the state of chronic 'diabetes stress' could potentially accentuate a person's attachment strategies shifting them from secure to insecure function and affecting their long-term outcomes. Interestingly, studies of T1D and Type 2 diabetes (T2D) populations have been shown to have lower population of securely attached individuals than non-T1D and non-T2D populations and insecurely attached individuals had higher mortality at 5 years follow-up (Ciechanowski et al., 2010; Ciechanowski et al., 2002).

It is also plausible that blood glucose impacts mentalization per se and could be part of the recognised affective symptoms seen clinically in hyperglycaemia i.e. changes in glucose at the extreme with either hypo or hyperglycaemia could affect the biological process of mentalization (Warren, Deary, & Frier, 2003).

Diabetes distress and mentalization: future risk for disorders of personality and eating

There is already substantial evidence that disruptions in mentalizing both temporary and stable are observed in a range of different psychopathologies including disorders of eating, personality and anxiety (Luyten & Fonagy, 2015). Luyten and Fonagy point to two aspects that are fundamental in mentalizing capacity, stress or arousal and attachment strategies in response to arousal. It is quite plausible that the arousal caused by diagnosis of T1D (i.e. 'diabetes distress') could at least temporarily affect the mentalizing capacity of the young person and their parent in the early stages. However, for those with limited mentalizing capability prior to a diagnosis, the imposition of T1D and its associated arousal could be potentially highly disruptive to mentalizing long-term, leading to more frequent and more

prolonged periods of non-mentalized states. In addition, the attachment strategy in the response to 'diabetes distress' is also important in keeping mentalizing 'online' and when a strategy does not produce the desired response from the attachment figure this could further lead to non-mentalized states. The thesis would be that it is these prolonged and / or more frequent disruptions in mentalization that could explain some of the increase in mental health presentations and psychiatric diagnoses in T1D (Colton et al., 2015; Dybdal et al., 2018; Mannucci et al., 2005), particularly those diagnoses with an established link with mentalizing capacity, such as BPD and BN. BPD is characterised by impulsivity, lack of a stable sense of self and unstable intense relationships. For people with limited capacity to mentalize and environment not conducive to containment and mentalization by proxy, the distress of a new diagnosis of T1D might lead to greater difficulty in emotion regulation and further limiting capacity to mentalize. In the case of BPD, 'lack of sense of self' may be explained through heightened arousal and oscillating states of inadequate mentalizing, such as pretend mode and psychic equivalence, where in the former there is disconnected statements such as 'at least it isn't cancer', and a disavowal of the impact of the condition, whilst in the latter the new diagnosis is experienced as having fundamentally changed who they are perhaps leading to ideas such as 'I am damaged' or 'I am not whole'. Expression of excess arousal through the non-mentalized state of teleological functioning, where feelings are expressed through action might lead to self-harm, and in the case of BPD in T1D their might be overdose with insulin or insulin omission in order to become unwell with hypoglycaemia or DKA respectively, thus receiving care that might otherwise not be asked for. Pathways might be similar for eating disorders which also have established links with impairments in mentalization (Jewell et al., 2016). Psychic equivalent states may manifest as strongly held beliefs of imperfection because of T1D and thinness may be pursued as a method of regaining an idealised sense of self. In addition, insulin may become concretely experienced as fat inducing and therefore regularly omitted as a method of weight reduction. Additionally, there may also be overeating as a counter-response to the impact of 'diabetes distress' on emotion regulation, further complicating glucose regulation and weight management. This presentation of insulin omission, concern over weight and shape and dysregulated eating has been well documented in the last decade and termed by some as 'diabulimia' (Staite et al., 2018).

One can envisage in these examples, a pathway between vulnerable capacity in mentalization and eventual development of a psychiatric diagnosis; one that is intrinsically interconnected with diabetes, diabetes distress and impacting self-management.

Clinical applications: attachment theory in the diabetes clinic

Using the ideas as outlined above, explicit use of attachment theory could be used at a number of different levels of clinical services: 1) organisational - in terms of how a service operates and approaches work with its young people, particularly with those who do not seek help; 2) familial - in terms of specific interventions for care-givers of young people with T1D; and 3) individual - one to one or group settings for young people with T1D.

There is long-standing evidence that families value continuity of care and there is considerable emphasis on its importance during the period of transition into adult diabetes services (Rachas et al., 2016) and even when diabetes services are well tailored and structured 5-10% of young people disengage (Farrell, Fernandez, Salamons, Griffiths, & Holmes-Walker, 2018). An attachment-orientated approach to services emphasises the importance of therapeutic relationships, provides availability at times of crisis, has institutional memory and notices when people do not attend clinic. It would seem probable that services that are harder to access and provide discontinuity of care are likely to have disengagement by families or individuals who have more insecure attachment. Further to this, mentalization has been increasingly used in the UK, as a method of organising the structure of clinical services and approach to supervision, particularly for child and adolescent mental health services (Bevington, Fuggle, & Fonagy, 2015). Adolescent Mentalization-based Integrative Treatment (AMBIT) has been specifically used for young people who do not seek help or are even oppositional towards care, with mentalization playing an active role in how clinicians discuss the challenges of their clinical work and in how information is conveyed to external agencies. This approach could be beneficial for clinicians using case management of young people with T1D and recurrent DKA. There is growing evidence that this group are more likely to be disengaged from services, struggle to care for themselves, as evidenced by admissions and very high HbA1c and have associated difficulties with their mental health (Garrett, Choudhary, Amiel, Fonagy, & Ismail, 2019; Garrett et al., 2020).

The principles of mentalization have been investigated as an approach to supporting children via their families and schools and have recently been systematically reviewed (Byrne, Murphy, & Connon, 2020). In these interventions caregivers are supported in their endeavours to make better inferences as to the mental states of their children, improving self-regulation and increasing security of relationships. This application could be extended to the diabetes setting. As previously discussed, there is potential for mentalizing capacity to be influenced by 'diabetes distress', and therefore an intervention might help families in their 'mentalizing' of the impact of diabetes on the young person. For example, a parent gets

regularly anxious and frustrated by their child's under use of insulin. An intervention might support the parent in being curious and reflective about what is happening for their child and may help them to reflect on what behaviours represent.

MBT already has a considerable evidence base for treatment of BPD symptoms and recent studies have also shown benefit in an adolescent population (Jørgensen et al., 2020) and there is also an increasing evidence base for the role of mentalization in eating disorder psychopathology (Jewell et al., 2016). MBT could therefore be a potential approach to young people with T1D with difficulties regulating emotions with or without deregulated eating and struggling to follow a diabetes regime. MBT has already been used to address non-concordance in young people with chronic illness in the dialysis setting (Malberg, 2013). Interestingly, the ideas of mentalization were first applied in young people with T1D by George Moran in the 1980s (Fonagy & Target, 1998; Moran, Fonagy, Kurtz, Bolton, & Brook, 1991).

Conclusions

We have outlined the potential role that attachment and mentalization play in adaption to T1D, particularly alongside 'diabetes distress' and linked these ideas to established evidence for the role of caregiver support and caregiver stress. We have suggested pathways between capacity for mentalization in young person and caregiver and potential developmental links to eating disorder symptoms and personality development. The universality of the ideas of mentalization and epistemic trust lend themselves to application within diabetes, but could also be applied to other areas where physical health substantially impacts mental functioning.

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