Exploring the Relationships between Attachment Styles, Emotional Intelligence and Patient-Provider Communication

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By

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Abstract

Background: Patient-provider communication (PPC) influences patients' health trajectories and general well-being, and its principles are taught and assessed during UK medical education. However, providers differ in their PPC, specifically of emotive issues. Two psychological characteristics have been proposed as potential influencers of PPC: attachment style and emotional intelligence (EI). **Aim**: To explore the relationships between providers' attachment styles, EI and PPC. **Procedures**: Three empirical studies were conducted in one UK medical school/deanery. Study 1 investigated the influence of 1st year medical students' ($n = 200$) attachment styles and EI on their PPC in an Objective Structured Clinical Examination (OSCE). Study 2 replicated Study 1 with 2nd year medical students, consulting in a more 'demanding' OSCE ($n = 296$). Study 3 studied junior doctors ($n = 26$) consulting in General Practice with real patients ($n = 173$). Attachment was assessed using the Experiences in Close Relationships: Short Form questionnaire, whilst EI was assessed with the Mayer-Salovey-Caruso Emotional Intelligence Test. PPC was assessed using OSCE checklists (Studies 1 and 2) and a patient satisfaction measure (Study 3). Consultations were videoed and coded with the Verona Coding Definition of Emotional Sequences, which quantifies patients' expressions of emotion and associated provider responses. **Analyses:** Data were analysed using structural equation modelling (Studies 1 and 2) and multilevel modelling (Study 3). **Results**: In all studies, providers' attachment styles and EI influenced their PPC. In Studies 1 and 2, EI mediated the influence of attachment on PPC, accounting for 7% and 14% of the variance in students' OSCE scores respectively. In Study 3, doctors' attachment and EI influenced the number of emotive cues received from patients; neither influenced patient satisfaction. Limited relationships were observed between providers' attachment or EI and their responses to patients' emotions across all studies. **Conclusions/Implications:** Attachment and EI independently influence PPC, but EI may mediate the negative influence of attachment. Whilst attachment is relatively stable throughout the life course, EI can be developed throughout undergraduate medical education, thus these data have potential educational implications. Further research is recommended to explore and validate these findings within the wider context of the clinical encounter.

Table of Contents

Chapter 3: Systematic Review of the Influence of Medical Students' and Doctors' Attachment Styles and Emotional Intelligence on their Patient-Provider Communication

List of Tables

List of Tables Continued

List of Tables Continued

List of Figures

List of Abbreviations and Notations

Abbreviation	Definition
χ^2	Chi-squared
Bar-On EQi	Bar-On Emotional Quotient Inventory
CAT-S	Communication Assessment Tool- Short Form
cf.	See or refer to
CFI	Comparative fit index
CMIN/d.f.	Chi-squared statistic divided by degrees of freedom
CRD	Centre for Reviews and Dissemination
CTX	Comprehensive performance examination
d.f.	Degrees of freedom
e	Measurement error
EACH	European Association for Communication in Healthcare
ECI-2	Emotional and Social Competence Inventory, Version 2
ECR	Experience in Close Relationships
ECR:SF	Experience in Close Relationships: Short Form
EI	Emotional intelligence
EVs	Explanatory variables
F	F-distribution variable
G-coefficient	Generalisability coefficient
GMC	General Medical Council
GP	General Practitioner
G-study	Generalisability study
IWM	Internal working model
LCSAS	Liverpool Communication Skills Assessment Scale
LICAS	Liverpool Clinical Interaction Analysis Scheme
LUCAS	Liverpool University Communication Assessment Scale
M	Mean
MSCEIT	Mayer-Salovey-Caruso Emotional Intelligence Test
MUS	Medically unexplained symptoms
N	Population size
n	Sample size
NHS	National Health Service

Abbreviation	Definition
NR	Not reported
OEA	Other-emotion appraisal
OSCE	Objective Structured Clinical Examination
p	P-value
PBL	Problem-based learning
PDR	Patient-doctor relationship
PDRQ-9	Patient Doctor Relationship Questionnaire
PPC	Patient-provider communication
r	Pearson's product moment correlation coefficient
r	Residual error
R^2	Coefficient of determination
REA	Regulation of emotion
RMSEA	Root mean square error of approximation
RQ	Relationship Questionnaire
SD	Standard deviation
SE	Standard error
SEA	Self-emotion appraisal
SEM	Structural equation modelling
SPSS	Statistical Package for the Social Sciences
t	Student's T-variable
TEIQue	Trait Emotional Intelligence Questionnaire
TMMS	Trait Meta Mood Scale
UOE	Use of emotion
VR-CoDES	Verona Coding Definition of Emotional Sequences
WLEIS	Wong and Law Emotional Intelligence Scale
α	Alpha coefficient
β	Beta coefficient
ρ	Rho
f	Sigma e coefficient
σ_u	Sigma u coefficient

Publications, Conference Proceedings and Grants Resulting from this Thesis

Peer-Reviewed Journal Publications

Cherry, M.G., Fletcher, I. & O'Sullivan, H. (2013) The influence of medical students' and doctors' attachment style and emotional intelligence on their patient-provider communication. *Patient Education & Counseling*, Jun 6. pii: S0738-3991(13)00210-3. doi: 10.1016/j.pec.2013.05.010. [Epub ahead of print]

Cherry, M.G., Fletcher, I. & O'Sullivan, H. (2013) Exploring the relationships among attachment, emotional intelligence and communication. *Medical Education*, 47, 317-325.

Cherry, M.G., Fletcher, I., O'Sullivan, H. & Shaw, N. (2012) What impact do structured educational sessions to increase emotional intelligence have on medical students? BEME Guide No. 17. *Medical Teacher*, 34, 11-19.

Book Chapters

Cherry, M.G. (2010) Teaching and assessing communication skills in medicine. In Watmough, S. (Ed.) *Succeeding in your medical degree: Becoming Tomorrow's Doctors*. Sage: Learning Matters.

Conference Proceedings

Cherry, M.G., Fletcher, I., O'Sullivan, H., Finset, A. & Del Piccolo, L. (2012) A systematic review of cues and concerns in primary care: 1975-2012. *European Association for Communication in Healthcare*. St Andrews, UK.

Cherry, M.G., Fletcher, I., Watmough, S. & O'Sullivan, H. (2012) Small Grant Award 2011: The communication skills of medical students: video analysis, OSCE scores and emotional intelligence. *Association for the Study of Medical Education*. Brighton, UK.

Cherry, M.G., Fletcher, I., Leadbetter, P. & O'Sullivan, H. (2011) First year medical students' attachment style, emotional intelligence and communication skills. *Association for the Study of Medical Education*. Edinburgh, UK.

Cherry, M.G., Fletcher, I. & O'Sullivan, H. (2011) Doctors' attachment style, emotional intelligence & communication skills in Primary Care. *American Association for Communication in Healthcare*. Chicago, USA.

Cherry, M.G., Fletcher, I. & O'Sullivan, H. (2011) Medical students' attachment style, emotional intelligence and communication skills. *American Association for Communication in Healthcare*. Chicago, USA.

Cherry, M.G., Fletcher, I., Watmough, S., O'Sullivan, H. & Shaw, N. (2011) The communication skills of junior doctors: video analysis and emotional intelligence. *Association for Medical Education in Europe*. Vienna, Austria.

O'Sullivan, H., **Cherry, M.G**.,& Fletcher, I. (2011) Do we need emotionally intelligent doctors? An investigation into the changes in emotional intelligence over the first year of an undergraduate medical degree course. *Association for the Study of Medical Education*. Edinburgh, UK.

Cherry, M.G., Fletcher, I. & O'Sullivan, H. (2010) The communication skills of medical students: video analysis, OSCE scores and emotional intelligence. *Association for the Study of Medical Education*. Cambridge, UK.

Cherry, M.G., Fletcher, I., O'Sullivan, H. & Shaw, N. (2010) What impact do structured educational sessions to increase emotional intelligence have on medical students? A BEME systematic review. *Association for the Study of Medical Education.* Cambridge, UK.

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Part 1: Locating the Field of Enquiry

1 Introduction to the Thesis

This thesis represents a body of original academic research, conducted to advance knowledge and understanding relating to factors influencing individual differences in patient-provider communication (PPC). The main research question investigated throughout this thesis is 'What influences do medical students' and doctors' attachment styles and emotional intelligence (EI) have on their PPC - and, more specifically, their PPC with patients showing signs of emotional distress?'

The purpose of this introduction is to provide the reader with an overview of the thesis. The background literature that informed the development of this research question is first discussed briefly and the structure of the thesis is outlined. The notion of PPC is then introduced, followed by a discussion of its clinical importance. The need for consideration of factors influencing PPC is discussed, and the two theoretical frameworks underpinning the research, attachment theory and EI, are introduced. The aim of the thesis is then stated and this section concludes with a summary of the thesis' structure, with reference made to the content and structure of each of its eight chapters, as a prefix to Chapter 1.

1.1 Rationale

The term 'PPC' relates primarily to the exchange of information (including that concerning symptoms, treatment and emotions) between patients and the health care providers involved in their care. 'Effective' PPC encompasses a number of factors: consideration of the social, psychological and biological elements of illness; understanding of the subjective importance of the illness for each patient; equality in the patient-provider relationship; awareness of the socio-emotional aspects of a consultation; and awareness of the influence of the provider's personal characteristics on the practice of medicine (Mead and Bower, 2000).

Effective PPC influences patients' health trajectories and general well-being and is an essential component of high quality medical care (General Medical Council, 2009b, Maguire and Pitceathly, 2002). However, there remains at the heart of the PPC research domain a serious issue worthy of study: providers differ in their PPC, particularly in their abilities to identify signs of emotional distress in their patients and respond in an appropriate manner, congruent with patients' needs (Del Piccolo et al., 2002).

The importance of effective PPC is well-reported. Lack of identification of, or inadequate responding to, patients' emotional distress leads to a number of iatrogenic patient outcomes, including incorrect diagnoses or treatment and unnecessary referrals; patient satisfaction and trust in the care provider may also be negatively affected (Ong et al., 1995, Levinson et al., 2000, Bensing et al., 2010). Indeed, most individuals can recite, upon request, a memory of ineffective PPC and its resulting impact on their, or their close others', emotional or physical well-being. Because of this, effective PPC is outlined by regulatory bodies as a core component of clinical practice (Swing, 2007, Frank, 2005, Epstein and Hundert, 2002) and its principles are taught and assessed during undergraduate and postgraduate medical education in the UK (Brown, 2008, Cherry, 2010).

However, not all students translate and apply such teaching in the same way, resulting in differences in their PPC in the clinical workplace. Indeed, whilst a large volume of literature has been dedicated to understanding and explaining individual differences in medical students' and doctors' PPC, the area still remains largely poorly understood.

Due to the complex nature of PPC, theoretical pluralism is recommended when studying factors influencing individual differences in PPC (Flyvbjerg, 2001). Two related psychological theories have been proposed as influencers of providers' PPC, thus potentially accounting for individual differences in communication. These theories are attachment theory, and the theory of EI.

The main tenet of attachment theory is that individuals develop close bonds with their caregivers in infancy, and these translate into the mechanism by which an individual conceptualises and relates to others in close relationships, such as the doctor-patient relationship (Bowlby, 1969). Attachment theory has mostly been applied to psychotherapy or mental health settings, with research demonstrating links between providers' attachment styles and their styles of PPC (Dozier et al., 1994). Attachment theory may therefore provide a theoretical framework for the study of individual differences in PPC (Hick, 2009, Adshead, 2010, Salmon and Young, 2009, Salmon et al., 2008, Salmon et al., 2007).

However, it is generally accepted that an individual's attachment style cannot easily be altered (Maunder and Hunter, 2008) and therefore if attachment influences

PPC, the resulting educational implications may amount simply to educating students about its possible influence. Another psychological characteristic, related to medical students' or doctors' attachment styles, which has also been tentatively linked to their PPC, is their EI (Kim et al., 2011, Hannah et al., 2009, Austin et al., 2005, Austin et al., 2007).

EI is the degree to which an individual is able to perceive, use, understand and manage their own and others' emotions (Mayer and Salovey, 1997) and begins to develop in childhood, partly as a function of attachment (Kafetsios, 2004). EI may help doctors to correctly identify when patients are showing signs of emotional distress, to manage their own emotions and to intervene in an appropriate manner within consultations. In contrast to attachment, EI can be developed over the course of an individual's undergraduate medical education (Sattersfield and Hughes, 2007, Cherry et al., 2012) and therefore implementing educational interventions to raise individuals' EI may also have a positive impact on their PPC.

This thesis therefore explores the influence of these psychological characteristics on PPC. The aims of this thesis are to:

1) Explore the relationships between medical students' and doctors' attachment styles, EI and PPC, with specific emphasis on how they identify and respond to patients' cues of emotional distress

2) Propose evidence-based recommendations for research and practice based on these findings.

Whilst researchers have separately considered the impact of attachment styles and EI on PPC (Austin et al., 2007, Salmon et al., 2007, Salmon et al., 2008, Hick, 2009, Fenton, 2009, Weng et al., 2008, Weng, 2008), this thesis is the first to consider the interplay between them and to investigate both in relation to PPC, thus providing unique data with important implications.

1.2   Chapter Outlines

The thesis is laid out over eight chapters, organised within three sections. Throughout, the term 'patient' is used to refer to any recipient of care, as is common throughout the research literature and in physical health care settings. The term 'medical student' is used to describe medical students at all stages of their

undergraduate medical education and the term 'doctor' is used to describe qualified doctors at any stage of their medical career. The term 'provider' is used as an overarching term to refer to medical students, doctors and other care providers, such as psychotherapists.

1.2.1 Part 1: Locating the Field of Enquiry

Part 1 comprises three chapters and is concerned with locating the field of enquiry and setting the context of the research conducted in this thesis within that of published empirical and theoretical literature.

Chapter 1 is a literature review whose purpose is to discuss relevant theories, concepts and published literature as a preface to the research conducted within this thesis and the variables examined in subsequent chapters. In Chapter 1, the notion of PPC is introduced with specific reference to undergraduate and postgraduate medical education, patient-centred care and the medical consultation. The emotional aspects of PPC are discussed in light of factors influencing patients' disclosure of emotional or psychosocial distress during medical consultations and the importance of such disclosure. Finally, Chapter 1 concludes with a summary of findings as a preface for the concepts discussed in Chapter 2.

Chapter 2 introduces the theoretical frameworks underpinning the empirical research conducted within this thesis: attachment theory and EI. The conceptualisation of adult attachment and its theoretical application to the study of individual differences in PPC is discussed, followed by a similar discussion of EI. Chapter 2 concludes by summarising the theoretical rationale behind applying attachment theory and EI to the study of medical students' and doctors' PPC.

Chapters 1 and 2 are primarily descriptive. Whilst informed by detailed literature searches, they do not claim to be exhaustive either in approach taken to find literature or in the literature selected for discussion. Rather, they aim to give an overview of the concepts investigated in this thesis, and form the foundation for Chapter 3. Chapter 3 uses transparent and rigorous methodology to systematically locate, appraise and narratively synthesise the findings of published research investigating the relationships between medical students' and doctors' attachment styles, EI and PPC. Gaps in the literature are identified and discussed, upon which

the empirical research in this thesis builds. Chapter 3 concludes with the rationale for the empirical component of this thesis.

1.2.2 Part 2: Research Strategy and Empirical Findings

Part 2 comprises three chapters. Chapters 4, 5 and 6 each report one of the three studies making up the empirical component of this thesis. Chapter 4 reports Study 1, an exploratory study investigating the influence of first-year medical students' attachment styles and EI on their PPC with simulated patients[1] in an examination setting. Chapter 5 reports Study 2, which furthers the findings of Study 1 by exploring the influence of second-year medical students' attachment styles and EI on their PPC with simulated patients in a more 'demanding' examination than that considered in Study 1. Chapter 6 reports the findings of Study 3, an exploratory pilot study investigating the relationships between attachment style, EI and PPC in a postgraduate junior doctor sample, consulting with patients in General Practice. In each chapter, the relevant methodological approaches and considerations are firstly described, including discussion of the measures and covariates employed in each study. Each chapter then presents its respective empirical findings, followed by a discussion of these in light of previous empirical and theoretical literature. Conclusions are drawn at the end of each study to provide the reader with context for interpreting subsequent chapters.

1.2.3 Part 3: Critical Interpretation of the Findings

Part 3 comprises the remaining two chapters. Chapter 7 discusses the strengths, methodological considerations and possible limitations of Studies 1, 2 and 3 to contextualise their findings. Chapter 8 summarises the collective empirical findings of these studies, discusses arising research and practice points, and then concludes the thesis by discussing its conclusions.

1.3 Summary

This introduction summarised briefly the rationale for, and contents of, this thesis, and introduced its research question and aim. Chapter 1, a descriptive literature review of PPC, will now be presented.

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[1] A simulated patient is an actor trained to present a standardised scenario of a patient

Chapter 1: Patient-Provider Communication

1   Introduction

The previous section introduced the thesis and outlined its aim: to explore the relationships between medical students' and doctors' attachment styles, EI and PPC, with specific emphasis on identifying and responding to patients' cues of emotional distress, and to propose recommendations for practice and research based on these findings. The importance of effective PPC was briefly discussed to contextualise the thesis' aim. The purpose of this chapter is to discuss PPC in more detail as a preface to the research conducted within this thesis and the variables examined in subsequent chapters. The chapter first outlines the importance of effective PPC to situate the research conducted within this thesis. It discusses its historical background, including the role of PPC skills' teaching and assessment during undergraduate and postgraduate medical education. The emotional aspects of PPC are then discussed in light of factors influencing patients' disclosure of emotional or psychosocial distress during medical consultations and the importance of such disclosure. The associations between effective PPC and positive patient outcomes are highlighted in order to demonstrate the importance of researching factors influencing individual differences in providers' PPC. Some potential factors influencing individual differences in providers' PPC, including gender, attachment styles and EI, are then introduced. Finally, the chapter concludes with a summary of findings as a preface for discussion of the theoretical frameworks underpinning the research, which takes place in Chapter 2.

2   Search Strategy

In order to identify relevant literature to inform this chapter, five electronic databases were searched: The Cochrane Library, Medline[2], Embase, CINAHL[3] and PsycINFO. These databases were chosen to encompass several disciplines and to be as exhaustive as possible when considered together: Medicine and Healthcare (Medline, The Cochrane Library and Embase); Psychology (PsycINFO); and Nursing (CINAHL). CINAHL was chosen because relevant literature for this chapter was thought to be both qualitative and quantitative; CINAHL has indexed qualitative

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[2] Ovid Medline (R) In-Process and Other Non-Indexed Citations
[3] Cumulative Index to Nursing and Allied Health

studies for longer than other databases (Flemming and Briggs, 2007). A search strategy was developed based on a combination of Medical Subject Heading (MeSH) terms[4], such as 'Provider-Patient Relationship', and free-text words[5], such as 'communication'. Medline was initially used to map terms to subject headings and to pilot the search terms. The search strategy was modified for each database to fit with each database's MeSH subject headings. Searches were not limited by date but were limited to English language publications only. The search undertaken across Medline is presented in Table 1 for illustration.

Table 1

Search Strategy for Chapter 1: Medline

Number	Term
1	Professional-Patient Relationship/ OR Physician-Patient Relationship/ OR Provider-Patient Relationship/ OR patient-centred*.mp OR patient-centered*.mp
2	(verbal communication OR non-verbal communication OR non-verbal behaviour OR non-verbal behaviour OR communication).mp
3	Interview, Psychological/
4	(consultation OR interview OR appointment OR visit OR encounter OR interaction OR cue* OR concern*).mp
5	1 OR 2 OR 3 OR 4
6	(student OR doctor OR physician OR provider OR practitioner OR clinician).ab,ot,ti
7	5 AND 6
8	Limit 7 to (english language and humans)

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[4] The National Library of Medicine's controlled vocabulary thesaurus, consisting of sets of terms naming descriptors in a hierarchical structure that permits searching of electronic databases at various levels of specificity

[5] Free-text words are used by authors in the title and abstract of their studies when published as journal articles; these terms are then searchable in the title and abstract of electronic records in databases

The citations identified by the search strategy were assessed for their relevance to the chapter by firstly screening all relevant abstracts and titles. Full-text copies of potentially relevant citations were then obtained and assessed for their relevance. Bibliographies of retrieved and relevant systematic reviews and articles were subsequently examined to ensure that papers conducted in undergraduate medical education settings were not missed. The wider literature was also consulted to provide context for the data discussed within papers. Whilst this approach was selective rather than exhaustive in its approach, searching and selection of studies followed published guidelines to ensure rigour (Centre for Reviews and Dissemination, 2009). Searches were conducted in January 2012 and were repeated during the writing of the Discussion sections of Chapters 4, 5 and 6 and prior to submission to check for new articles relevant to this chapter. Relevant literature will now be discussed.

3 Patient-Provider Communication

3.1 Historical Perspective of Patient-Provider Communication in Medical Education

The medical consultation is a two-way interaction between doctor and patient which is contextually and temporally defined and which has a high degree of specificity. It is the main forum for the exchange of ideas and information between patient and doctor, and this communication forms the basis for subsequent medical decision-making and treatment plans (General Medical Council, 2009b).

Traditionally, in the medical consultation, there was a perceived competence gap between doctor and patient (Stimson and Webb, 1975). Medical decision-making within consultations was physician-led, medically-driven and patient participation was discouraged. However, over the last 50 years, a shift from a doctor-centred, biomedical consultation style to a more patient-centred orientation, integrating biomedical history taking and psychosocial discussion, has occurred gradually. The medical consultation began to be seen as a meeting between two equally competent experts, each with a different area of expertise; the patient being competent in their 'illness world' and the doctor being expert in the 'disease world' (Stewart and Roter, 1989). This shift in emphasis is reflected in the development of a number of progressive models of medical consultations, which draw on several

different disciplines including psychology, sociology and anthropology (De Haes, 2006, Silverman et al., 2005, Stewart and Roter, 1989, Engel, 1977). The historical background to PPC within the medical consultation will now be discussed briefly in order to contextualise the research reported within this thesis.

Changing attitudes to the medical consultation began in 1969 with the work of Enid Balint. Balint coined the term 'patient-centred medicine' in a published address to the Royal College of General Practitioners (Balint, 1969). In this address, she proposed an alternative to the traditional 'illness-orientated' model of care by conceptualising a model of care whereby decision-making in medical consultations should be dependent on the needs of the individual patient. She discussed the importance of doctors examining "*the whole person*" in order to understand the patient as "*a unique human being*" (Balint, 1969). In short, her address highlighted the importance of effective PPC in understanding and treating each patient's medical complaint as a unique illness.

Despite active patient participation in the medical consultation being advocated and encouraged by Balint (1969), later research revealed a continued discrepancy between patient behaviour during consultations (characterised by passive and polite conduct) and attitudes expressed during post-consultation briefings (characterised by critical appraisal of consultations) (Stimson and Webb, 1975). Indeed, the majority of consultations were still heavily doctor-dominated, with active patient participation or attempts by the doctor to elicit patients' concerns about their illness rare (Byrne and Long, 1976). Doctors dictated the level of patient involvement in the consultation by exhibiting predominantly closed information-gathering behaviours, resulting in minimal patient contribution. Rarely did doctors display non-directive counselling behaviours, thus allowing patients to talk unimpeded (Byrne and Long, 1976).

In response to this, Engel (1977) proposed a biopsychosocial model of illness, in which the contribution of both organic and psychological factors towards illnesses was stressed. The importance of treating the patient as a whole person was emphasised, thus encouraging doctors to treat both physical and psychological presenting complaints as one. Despite this, subsequent research in junior doctors consulting in General Practice found that the majority still did not take account of

patients' feelings, concerns or expectations regarding treatment plans whilst delivering information (Maguire et al., 1986), indicating incongruence between researchers' recommendations for clinical practice and providers' actual clinical behaviour.

Stewart and Roter (1989) subsequently proposed their disease-illness model of medical consultations, based on an analysis of over 100 GPs consulting with over 500 patients. In this model, they outlined that an effective consultation should combine two parallel pathways, simultaneously pursued and given equal importance. One pathway should follow a 'disease' framework. This should be characterised by biomedical information seeking, in which the doctor sets the agenda, explores symptoms, signs and investigations and considers the underlying pathology of the patient's presenting complaint to produce a differential diagnosis[6]. The other should follow an 'illness' framework. In this framework, the psychosocial and emotional aspects of illness should be discussed and the patient should be treated as an individual experiencing unique symptoms of illness. A shared understanding of the illness between patient and doctor should be sought through discussion of the patient's concerns, ideas, thoughts, feelings and expectations. They proposed that an effective consultation should successfully 'weave' the two frameworks together, in a way that maintains their integrity, in order to give a shared understanding of the presenting complaint. Stewart and Roter (1989) discussed how successful adoption of this approach should allow for collaborative explanation, planning and decision making.

In the 1990s, moves in perceptions towards the patient-provider relationship and in medical education began to occur. Factors influencing these moves in the UK included social, economic and political environmental changes (Salmon and Young, 2005); the political influences of neo-liberalism, in which both the structure of the NHS and the views of society changed, transformed the patient from a passive element to an active consumer of services, with a responsibility to manage their own care and lifestyle (Brown, 2008). Awareness of the therapeutic benefits of effective PPC for both patients and providers emerged (Kaplan et al., 1989, Rost et al., 1989, Roter and Hall, 1993, Hickson et al., 1994, Stewart, 1995, Levinson and Chaumeton,

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[6] A differential diagnosis is a list of all possible diagnoses for a set of presented symptoms

1999, Stewart et al., 1999a, Street, 2001). Simultaneously, rather than being a forum to solely produce graduates who were competent for independent medical practice, undergraduate medical education began to be viewed as a platform to prepare students for the transition to their first post-graduate year as practising doctors (Watmough, 2008).

This shift in UK undergraduate medical education became formalised in 1993 with the publication of *Tomorrow's Doctors* (General Medical Council, 1993). This document called for a major reform of UK undergraduate medical curricula, including the mandatory integration of PPC teaching and assessment and the introduction of other professions other than clinical medicine in the teaching of PPC (Brown, 2008, Taylor, 2009). This marked a cornerstone in PPC skills' teaching and assessment; prior to the publication of *Tomorrow's Doctors*, formal teaching or assessment of 'soft' skills such as PPC skills during undergraduate or postgraduate medical education was optional and rarely included (Frederikson and Bull, 1992) and PPC skills were not seen as distinct from diagnostic and management skills. Formal PPC education was restricted to psychiatry and general practice clinical placements and was limited or absent from medical curricula (Hargie et al., 2010). Assessment, when conducted, was in short and long cases[7], which primarily focused on the medical aspects of patient care rather than communication processes.

Medical curricula were reformed in the UK following the publication of *Tomorrow's Doctors* (General Medical Council, 1993), with curricula placing the patient and their clinical picture at the starting point of students' learning rather than the end, as had traditionally been accepted and taught (De Haes, 2006). The general move was towards more active learning, developing a more favourable balance between biomedical learning and more socially focused clinical learning, and being more respectful of patients' autonomy. Emphasis was placed on the teaching and learning of PPC within a clinical context and PPC began to be seen as a skill that

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[7] In a 'short case', candidates are given approximately 8-12 minutes to examine a patient's body system or anatomical area and are then asked to give a brief summary of the findings of the examination, the patient's likely differential diagnosis and the probable causes and severity of the patient's condition. Generally, candidates are asked to complete four to five short cases in sequence. In a 'long case', candidates are given a varying amount of uninterrupted and unexamined time (usually between 30-50 minutes) to interview and examine a real patient, untrained for examinations. Candidates are then required to present their findings to the examiner(s) as in an unstructured oral assessment, and are further examined on their findings, diagnosis, management and related knowledge of the patient's presenting complaint.

could be acquired, measured and developed over the course of an individual's medical education (Aspegren, 1999, Brown, 2008, Salmon and Young, 2005). Problem-based learning (PBL)[8] was introduced as a means of both reducing the factual burden of didactic science knowledge and promoting effective PPC skill development (Aspegren, 1999). Emphasis was placed on cultural, social, emotional and psychological outcomes of illnesses, as well as the impact of illnesses on patients' families. Attitudinal elements of medical education were also stressed; showing respect for patients and colleagues, being aware of uncertainties and limitations, ability to cope with uncertainty and knowing when to ask for help were emphasised. A shift from hospital-based teaching to more General Practice teaching was advocated in order to teach students about the social and emotional contexts of illness.

Furthermore, Objective Structured Clinical Examinations (OSCEs) were introduced as means of objectively assessing both PPC and clinical skills during undergraduate medical education. Although OSCEs differ between institutions, students generally interact with a simulated patient in any number of different timed interactions. In each interaction (or station), students are assessed on their ability to respond to the simulated patient's presenting problem by an examiner who rates their performance using a standardised mark sheet (Cherry, 2010). The simulated patient may or may not also provide feedback on the students' performance. Whilst the use of short and long cases had been widely criticised on the basis of their reliability and lack of objectivity and standardisation between candidates (Wass and Van Der Vleuten, 2004), the introduction of OSCEs went some way to address these issues because of their standardised nature (Epstein and Hundert, 2002). The word standardised reflects the main objective of the OSCE; simulated patients receive the same scripts and training to ensure minimal variation in their performances across examiners and students, and checklists and rating scales are also standard across students and examiners (Mazor et al., 2005). With the introduction of PBL and OSCEs, and the need to obtain new skills, attributes and psychosocial knowledge, medical education began to change from a didactic process towards a problem-

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[8] A student-centred pedagogy in which students learn about a subject through the experience of problem-solving

solving process, with a more collaborative relationship between teacher and student (Dornan, 2006, Philips, 2008).

In line with this changing view of PPC skills in undergraduate medical education, Silverman, Kurtz and Draper (2005) proposed the Calgary-Cambridge model of medical consultations. This model adopted an evidence-based approach to integrating both the 'tasks' of the consultation (the 'disease' and 'illness' aspects, also known as biomedical and psychosocial information gathering) through effective PPC skills. This model proposed five tasks, or competencies, which it outlined must be accomplished in order for the consultation to be effective from a communicative point of view:

- Initiating the session
- Rapport building
- Information gathering
- Information giving
- Planning and closing the session

To aid curriculum planners in the design, implementation and review of PPC skills' curricula in order to fulfil such competencies (Silverman et al., 2005), the UK Council of Clinical Communication Skills Teaching in Undergraduate Medical Education was established (Von Fragstein et al., 2008). This group outlined that a patient-centred approach should be taken in the teaching of PPC skills and specifically highlighted the need to obtain skills such as establishing, recognising and meeting patients' needs, and eliciting and considering patients' agendas, as central to a patient-centred approach (Von Fragstein et al., 2008). The authors also outlined that, in addition to a patient-centred approach, skills that were readily observable, such as eye contact, were essential to promote active facilitation and emotional exploration with patients (Von Fragstein et al., 2008).

Tomorrow's Doctors was subsequently revised in 2009 (General Medical Council, 2009b). In the revised document (hereafter referred to as *Tomorrow's Doctors: Revised* for clarity), emphasis was placed on the importance of graduates' interpersonal skills in congruence with their biomedical knowledge and clinical skill requirements (Cherry, 2010). *Tomorrow's Doctors: Revised* (General Medical

Council, 2009b) further stated that, to improve graduates' PPC skills, patient experience must be included throughout all years of undergraduate medical curricula, with an increase in duration and responsibility as students approach the end of medical school (General Medical Council, 2009b).

As a result of changing attitudes and practices regarding the importance of effective PPC, the goal of undergraduate medical education in the UK changed. Its aim is now to produce doctors who are competent to work in the National Health Service (NHS) and to continue their medical education into specialist training (General Medical Council, 2009b). Undergraduate medical education now generally consists of 5 years of training, encompassing the teaching and learning of both biomedical sciences and interpersonal skills, and the translation, application and integration of theory, knowledge and skills to the clinical workplace setting (Dornan, 2006). Newly-qualified doctors then enter a two-year Foundation programme. The Foundation Programme is a two-year generic training programme which forms the bridge between medical school and specialist/General Practice training. The aim of the Foundation Programme is to provide the graduate with an opportunity for development and enhancement of their clinical and interpersonal skills. This is achieved through workplace-based learning across a series of six closely supervised four-month placements within different specialties, including a placement in General Practice during the second Foundation year[9]. Following successful completion of the Foundation Programme, doctors then undertake three years of core training, followed by between three and seven years of specialist training, depending on their specialty choice (General Medical Council, 2013).

In contrast to historical practice, effective PPC is now accepted as forming the basis of an effective medical consultation (General Medical Council, 2009a, General Medical Council, 2009b). As a result, PPC skills' training is now a core and mandatory taught and assessed component of undergraduate and postgraduate medical education in the UK (Brown, 2008, Cherry, 2010, Hargie et al., 2010, General Medical Council, 2012a) with most undergraduate curricula following the Calgary-Cambridge model of medical consultations (Silverman et al., 2005).

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[9] In some Deaneries, General Practice placement is obligatory for successful completion of the Foundation Programme. In others, including the Mersey Deanery (the Deanery from which the junior doctors in Study 3 were recruited, see Chapter 7), General Practice placement is optional.

Undergraduate medical curricula differ slightly in how they implement the recommendations of *Tomorrow's Doctors: Revised* (General Medical Council, 2009b) with respect to PPC skills' teaching and assessment (see the Case Study on page 17). However, all UK medical schools now formally teach PPC skills and assess students on their PPC competencies throughout their undergraduate medical education, mainly in the form of OCSEs (Hargie et al., 2010). Indeed, the development and acquisition of PPC skills throughout undergraduate and postgraduate medical education is now viewed as equally important as the development of biomedical knowledge and technical skills (Brown, 2008, Cherry, 2010).

3.2   **What is Effective Patient-Provider Communication?**

It is necessary for educationalists, practitioners and researchers to define what is meant by effective PPC, given that it is generally accepted to form the basis of an effective medical consultation (General Medical Council, 2009a, General Medical Council, 2009b). Whilst definitions of effective PPC vary in the literature, it is generally accepted as comprising of three components:

- Consideration of the needs, wants, concerns, perspectives and individual differences of patients
- Offering patients the chance to participate in their care plans and enhancement of the partnership
- Understanding of the doctor-patient relationship (Epstein et al., 2005, De Haes, 2006)

More overarching perspectives define effective PPC as the ability to be flexible in responding to patients' needs and preferences and adjusting PPC accordingly (Zandbelt et al., 2007) by treating each patient as an individual and exploring their thoughts and beliefs. The definition of effective PPC used throughout this thesis is the exchange of information (including that concerning symptoms, treatment and emotions) between patients and the providers involved in their care in a way that enables the provider to understand the meaning of illness for the patient as well as interpret it in terms of the medical frame of reference.

Case Study: Teaching and Assessment of Patient-Provider Communication at the University of Liverpool

At the University of Liverpool (the institution in which the research described in this thesis was mostly conducted), PPC is a mandatory taught and assessed component of undergraduate medical education. An integrated PPC programme assists students to develop awareness of their communication skills and develop these further through a range of activities, including encounters with real and simulated patients. PPC skills' teaching is integrated into the first four years of the curriculum, with real patient contact increasing in duration as students progress through medical school. The role of exploring the emotional, social and psychological context of each consultation rather than engaging in a rigid biomedical discourse is emphasised at each stage. In year one, students are introduced to the notion of PPC in clinical settings in order to give them an understanding of the importance of PPC in becoming an effective practitioner. In year two, students' abilities to communicate with patients in emotionally sensitive clinical settings are developed. In year three, students are taught to critically reflect on the role of PPC in order to transfer classroom learning to practice. Finally, in year four, students' abilities to communicate with patients, relatives, carers and colleagues in specialised care setting such as palliative care are developed. Students then spend their fifth year on a series of clinical placements, allowing their PPC skills to further be refined and developed in actual clinical practice.

All students are assessed on their PPC throughout their undergraduate medical education using OSCEs. All students complete formative and summative PPC OSCE in each of their first four academic years and must pass each summative examination in order to progress through medical school. Formative OSCEs take place mid-way through the first four academic years and students are provided with feedback on their performance. Summative PPC OSCEs take place at the end of the first four academic years and are integrated into clinical skills OSCEs in years two, three and four. The combination of teaching and assessment is designed to equip graduates with the skills for effective PPC provision within the medical consultation (University of Liverpool, 2012).

3.3 **Why Is Patient-Provider Communication Important?**

In the general population, a wide body of research links effective communication to a variety of positive outcomes. Effective communicators are better able to cope with stress, better able to adapt and adjust to major life transitions, suffer less from depression, anxiety and loneliness, and report higher satisfaction with close interpersonal relationships than their less skilled counterparts (Hargie and Dickson, 2011). In a clinical setting, the value of effective communication may be greater due to the prevalence and importance placed on the medical consultation (British Medical Association Board of Medical Education, 2004). Positive associations between effective PPC and tangible patient outcomes have been reported, including greater patient satisfaction with the standard of care; increased understanding of health concerns and treatment options; better recall of information; increased adherence to treatment; and decreased length of hospital stay (Kaplan et al., 1989, Rost et al., 1989, Roter and Hall, 1993, Hickson et al., 1994, Stewart, 1995, Levinson and Chaumeton, 1999, Stewart et al., 1999a, Street, 2001, Adams et al., 2012).

In addition to tangible measures, a further mechanism by which effective PPC may determine patients' health outcomes is through its role in highlighting individual patient variation in the extent of patients' wishes to be involved in their own care and decision making, an influential factor in treatment success and adherence (McKinstry, 2000, Swenson et al., 2004). There are a variety of reasons postulated as to why patients may or may not prefer a doctor-directed care approach. Patients may feel too unwell or vulnerable to take on a partner role within the consultation and make decisions regarding treatment or care (Salmon and Young, 2005). Certain social groups may have differing expectations of the medical consultation and their role within it, which in turn may affect preference (Little et al., 2001b). Complexity of needs, particularly in older patients may also limit engagement with or desire for mutual decision making (Little et al., 2001b); factors such as age, educational level and prior experience of shared medical decision making also influence preference for patient involvement (Swenson et al., 2004), as do the direction and style of the medical consultation. Patients are less inclined to wish to participate in their own care when under pressure from others (Bertakis et al., 1991), when their questions or proffered information are ignored by the doctor

(McWilliam et al., 1994) and when information exchanges between doctor and patient are controlling (Beck et al., 2002, Hall et al., 1994).

Adopting a communication strategy at odds with the patient's wishes may lead to increased resistance to change or patient behaviour opposing that recommended by the doctor (Hall et al., 1994). It is not always evident whether patients wish to participate in the consultation but do not feel confident, or whether they feel that the role of a doctor is to provide information and diagnosis with minimal patient input. For example, whilst some patients may initially express reticence towards shared decision-making, adopting a more passive role (McKinstry, 2000), research suggests that these patients can be encouraged to participate to a greater extent through skilled use of effective PPC (Mercer et al., 2008). By incorporating reflective questioning during information-giving sequences in order to determine patients' feelings about involvement in treatment plans, motivation to change health behaviours and patient resistance to treatment, doctors can maximise chances of fostering the appropriate information-giving behaviour (Bertakis et al., 1991, Levinson and Roter, 1995, Rubak et al., 2009, Childers et al., 2012, Pollack et al., 2011). Such literature highlights the importance of effective PPC with regards to minimising iatrogenic patient outcomes.

It is also important to note that complaints about doctors' PPC, across all specialties, increased by 64% from 2010 to 2011 (General Medical Council, 2012b). Despite General Practice generally forming patients' first access to medical services, the GMC received proportionally more complaints about GPs, in 2011, than about doctors working within other specialties; 47% of all complaints to the GMC in 2011 were made against GPs, despite them representing only 24% of the register (General Medical Council, 2012b). This pattern is consistent with the pattern of complaints against doctors over the last five years. Of note is that, of these complaints, the majority were about how GPs communicated or built relationships with their patients. These figures further highlight the importance of effective PPC to patients and emphasises why PPC skills are taught and assessed throughout undergraduate and postgraduate medical education.

3.4   **Patient-Provider Communication in Practice**

It is emphasised throughout undergraduate and postgraduate medical education that it is inappropriate to adopt the same communication style for all patients in all contexts; rather, flexibility in communication style whilst maintaining an awareness of patients' needs and values should be advocated (General Medical Council, 2009a, General Medical Council, 2009b, De Haes, 2006). This can be argued to be particularly important when engaging in advanced PPC such as breaking bad news (Jha and Setna, 2008), although patients in primary care also highlight the importance of the doctor '*fostering the relationship*' through flexible, open and non-judgemental PPC (Deledda et al., 2013).

This principle forms the cornerstone of effective PPC and can be argued to be particularly pertinent when dealing with patients presenting with emotional, psychological or psychosocial issues (Winefield et al., 1995). The challenge in all medical consultations, but particularly in those with a psychosocial focus, is in recognising and adequately dealing with both the emotional aspect and the medical aspect of the consultation in a way that encourages patients' expressions of emotions and worries. This is in line with the Calgary-Cambridge model (Silverman et al., 2005) and maximises the chances of doctors correctly identifying and treating patients' presenting problems and any subsequent underlying issues which may impact on treatment outcome.

However, when considering PPC in practice, an assumption is often made that doctors are able to correctly identify patients' expressions of emotional or psychosocial distress, process these and respond accordingly in a manner tailored to the individual patient, congruent with their needs. However, whilst emotion or emotive distress or other factors is frequently presented by patients in medical consultations, it is not often explicitly and spontaneously verbalised (Butow et al., 2002); rather patients often wait for doctors to initiate emotive discussions (Detmar et al., 2000, Robinson and Roter, 1999), often assuming providers are not interested in the psychosocial elements of their illnesses (Heaven and Maguire, 1997). Patients' expressions of emotion are relatively infrequent when compared to their questions or provision of information related to their symptoms or illness (Zimmermann et al., 2007). When verbalised, emotion is often expressed as an indirect hint or cue to

emotional distress (Suchmann et al., 1997) and therefore may be more difficult to detect (Suchmann et al., 1997, Zimmermann et al., 2007) and appropriately identify or handle (Heaven and Maguire, 1997, Zimmermann et al., 2007). The literature refers to such indirect hints of emotion as cues, concerns and/or clues. Definitions of cues and concerns vary across studies; for the purpose of this thesis, any underlying hint of emotional distress that has subjective importance and a negative emotional impact (Zimmermann et al., 2007) will be referred to as a cue, unless stated otherwise.

3.5   The Emotional Aspects of Patient-Provider Communication

The challenge for doctors in practice is to correctly identify moments where an empathic response or further discussion/clarification of the cue is required. This is particularly pertinent when considering that, whilst emotion is rarely explicitly stated, cues are frequently presented in medical consultations. For example, in General Practice, patients tend to present implicit hints or cues to emotional distress four times as frequently as explicit statements (Robinson and Roter, 1999, Del Piccolo et al., 2000, Levinson et al., 2000, Del Piccolo et al., 2002), with such cues generally relating to depressive symptoms or low mood (Salmon et al., 2004) and varying according to the patient, their presenting complaint(s) and the doctor (Zimmermann et al., 2007).

It is estimated that patients present one or more cues in between 51% and 94% of consultations (Robinson and Roter, 1999, Marvel et al., 1999, Levinson et al., 2000, Salmon et al., 2004). An average of 2.40 to 6.60 cues have been found to be presented per consultation (Levinson et al., 2000, van Dulmen and van den Brink-Muinen, 2004, Street et al., 2005, Del Piccolo et al., 2007, Bensing et al., 2008, Bensing et al., 2010), with rates as high as 12 cues per consultation reported (van den Brink-Muinen and Caris-Verhallen, 2003). Rates of cue presentation in General Practice are similar to other healthcare settings; a recent review of cues and concerns in medical consultations across a variety of settings, including oncology, psychiatry and paediatrics, reported a mean frequency of 1.30 to 6.80 cues per consultation (Zimmermann et al., 2007).

Numerous reasons have been proposed for the variations in frequency of explicitly voiced emotion or cues to emotional distress in medical consultations.

Patients may feel embarrassed or afraid to voice their concerns, or may find it hard to verbally express emotion (Del Piccolo et al., 2008, Little et al., 2001a). This notion is supported by the work of Barry and colleagues, who found that, when interviewed post-consultation, patients often verbalised concerns that were not raised directly or spontaneously during their consultation (Barry et al., 2000). Personal factors such as patients' stress levels may impact on initial and subsequent presentation of emotion (Hulsman et al., 2009, Neumann et al., 2007). Type of illness and beliefs about the value of such disclosure may also affect cue emission (Heaven and Maguire, 1997), with patients experiencing psychological distress significantly more likely to express cues than their non-distressed counterparts (Del Piccolo et al., 2000, Del Piccolo et al., 2007, Robinson and Roter, 1999, van Dulmen and van den Brink-Muinen, 2004). If patients' cues are not listened to and responded to appropriately following initial presentation, then this too may impact on further presentation (Epstein et al., 2007, Eide et al., 2004a), either increasing frequency of cue presentation until the cue is adequately dealt with, inhibiting subsequent disclosure (Levinson et al., 2000) or resulting in the cue being 'catastrophised' (Dowrick et al., 2004).

3.5.1 How Do Doctors Respond to Patients' Cues?

Studies have been conducted to assess the appropriateness of doctors' responses to emotive cues, with 'adequate' responses defined as those which acknowledge and explore patients' cues, and 'inadequate' responses being those which miss the cue or reduce further discussion of emotive topics. Despite recognition of the importance of effective PPC, doctors often employ communication strategies which reduce or inhibit cue presentation; cues are 'missed' or responded to inappropriately by doctors on as many as 50-60% of occasions (Gask et al., 1987, Gask et al., 1988).

Frequently reported responses to patients' cues include ignoring them, changing topic or offering premature advice or reassurance (Maguire et al., 1996b, Zandbelt et al., 2007), attempting to 'normalise' them (Dowrick et al., 2004), interrupting or asking closed, leading or negative questions (Marvel et al., 1999, Arborelius and Österberg, 1995), especially when cues are non-explicit or indirect (Marvel et al., 1999).

On occasions where cues are responded to with facilitatory responses, these responses are more likely to be superficial (such as agreeing with the patient or paraphrasing their cue) rather than emotionally supportive (such as providing empathy, engaging in emotional discourse or providing supportive talk) (Street et al., 2005, van den Brink-Muinen and Caris-Verhallen, 2003, van Dulmen and van den Brink-Muinen, 2004, Del Piccolo et al., 2000), with return to a biomedical agenda soon after (Levinson et al., 2000, van den Brink-Muinen and Caris-Verhallen, 2003, van Dulmen and van den Brink-Muinen, 2004, Salmon et al., 2004). This can limit patient engagement with the consultation and impact on subsequent PPC.

There is a lack of consensus of opinion regarding the relationship between adequate or inadequate responses and subsequent cue presentation. PPC involving 'active interview techniques', such as checking information, asking for understanding or opinion and showing agreement with the patient can facilitate information giving and patient involvement and subsequently decrease cue emission (Del Piccolo et al., 2000, Del Piccolo et al., 2007, Zandbelt et al., 2007). It is argued that this occurs because patients do not need to 'catch' their doctor's attention through further cue presentation, suggesting that increased cue presentation within a consultation may not be indicative of doctors' clinical skill levels but rather may indicate a doctor who misses or ignores patients' cues, leading to re-presentation. However, other studies have reported variable rates of doctors' socio-emotional responding and patients' cue presentation, both as a function of individual doctors' consultation styles and patients' characteristics (Street, 1991, Street, 1992). Facilitatory doctor behaviour has been linked with patients' active participation in the consultation and subsequent increases in their cue presentation (Zimmermann et al., 2003, Del Piccolo et al., 2007, Goldberg et al., 1993, Street et al., 2005, Bensing et al., 2010). Inadequate responses such as blocking have been linked to increased presentation of cues and active participation by patients, thereby emphasising the complex and interactional nature of PPC (Salmon et al., 2004).

Sequence analysis[10] allows for an understanding of chronological sequences of dialogue in medical consultations by considering speech and behaviour

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[10] Sequence analysis is a method derived from conversation analysis, in which the order of communicative events is analysed, providing an opportunity to study how doctors and patients react to each other.

immediately preceding and following cues. In this respect, it may offer greater insight into the relationship between cue presentation and doctor behaviour (Zimmermann et al., 2003, Bensing et al., 2010). Zimmermann (2003) studied 238 General Practice consultations and found that doctors' open and closed questions relating to psychosocial topics or emotional support had no impact on subsequent cue presentation, but questions referring to content other than the cue content reduced cue presentation, as did medical information giving. It must be noted that the researchers did not consider cues elicited by the doctor, therefore limiting psychosocial information analysed, and used data from only six GPs. However, similar research in the area has been carried out, predominantly looking at event-based sequences (Goss et al., 2005, Rimondini et al., 2006, Zimmermann et al., 2003) and indicates that facilitative behaviour or acknowledgements are the most frequent 'adequate' responses to patient cues, occurring most frequently in the speech turn immediately following the cue (Rimondini et al., 2006, Zimmermann et al., 2003). Patients' expressions of cues are less often preceded by certain doctor behaviours, including social talk, giving instructions and providing biomedical information and counselling (Bensing et al., 2010).

Quantitative research can be triangulated[11] and supported with qualitative research findings and add greater depth to the study of cues and cue responses (Nolan and Behi, 1995). Arborelius and Österberg (1995) found that, in medical consultations where the patient explicitly expressed a cue, the doctor invited its discussion by using open-ended questions and an open approach and facilitated further discussion through empathic responses acknowledging the patient's emotions. Techniques for adequately following up cues and providing resolution included clarification or checking of information, facilitation of emotive discussions and checking for psychosocial or emotional issues not previously voiced. However, non-explicitly voiced cues resulted in a tendency for doctors to ask closed, leading or negative questions, therefore preventing further disclosure and discussion of emotion by patients. Similarly, Salmon and colleagues (2004) qualitatively analysed 36 doctor-patient interactions between GPs and patients presenting with medically

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[11] Triangulation refers to strategies employed during the research process to reduce the risk of findings being an artefact of a single method, research bias, participant perspective or overall theoretical approach

unexplained symptoms (MUS). They found that whilst opportunities for further exploration of cues or psychosocial elements of conversation were provided in all but two consultations by patients, of which half were indirect cues to emotional or social distress, doctors responded by either facilitating further discussion or with blocking behaviours. These included disregarding the cue, normalising it, reasserting a somatic agenda or emphasising the patient's responsibility for the symptom. In general, doctors failed to address patients' cues or psychological needs, reaffirming findings in previous research in the field (Levinson et al., 2000, Goldberg et al., 1993, Marvel et al., 1999, Del Piccolo et al., 2000, Gask et al., 1987, Bensing et al., 2008, Del Piccolo et al., 2002). These qualitative studies (Salmon et al., 2004, Arborelius and Österberg, 1995) further support the notion that doctors' verbal behaviours can influence the effectiveness of the PPC within the consultation, and indicate the disparity in doctors' responses to patients' cues.

3.5.2 Why Do Doctors Often Ignore Cues?

It is unclear whether doctors frequently choose, consciously or unconsciously, to ignore emotive cues, or whether such cues are genuinely not identified, possibly because the emotion is not directly expressed (Suchman et al., 1997). Reasons for ignoring cues may be due to the increased level of distress they elicit in doctors than more informational cues (Butow et al., 2002, Zimmermann et al., 2007, Kim et al., 2004), because doctors lack ability or confidence to successfully acknowledge and respond to them (Levinson et al., 2000, Zimmermann et al., 2007) or because of their timing within the consultation. Doctors may also wish to prioritise medical complaints (Giron et al., 1998), perhaps due to worries that responding to emotion may increase consultation length, which is a valid concern in specialties such as General Practice (Levinson et al., 2000), where consultation time is limited to between seven and twenty minutes (Deveugele et al., 2002). However, it is important to note that adequate identification of, and responding to, patients' cues can actually *shorten* rather than *lengthen* consultation length (Levinson et al., 2000).

Additionally, identifying and responding to emotion requires the doctor and patient to engage in emotive discourse, which may be challenging for doctors who employ strategies to avoid discussing psychosocial factors (Maguire and Pitceathly, 2002). As emotive cues are less frequently responded to than informational cues, it is

important to consider the role of individual characteristics influencing doctors' PPC, including their ability to identify and respond to cues. This has been highlighted as an important research avenue (Eide et al., 2004b, Salmon et al., 2004, Epstein et al., 2007, Street et al., 2009); further understanding of influencers of PPC may improve patient care relating to psychosocial or emotional issues and impact on undergraduate and postgraduate teaching of PPC.

3.6   Factors Influencing Patient-Provider Communication

The literature discussed in Section 3.3 of this chapter highlighted the importance of effective PPC for both patient and provider by discussing research linking it to a number of positive health outcomes for both parties. However, Section 3.5.1 of this chapter highlighted substantial variations in PPC between providers, particularly in their communication of emotive issues. It is unclear whether providers choose not to respond to emotive cues (Butow et al., 2002, Zimmermann et al., 2007, Kim et al., 2004), or whether they genuinely do not identify them (Suchman et al., 1997). However, what is clear is that there is a need for identification of individual characteristics of doctors that may influence their PPC and as such account for the variance in PPC observed and discussed in this chapter. This is particularly pertinent when considering undergraduate and postgraduate medical education; medical students must reach a certain standard with respect to their PPC in order to progress through medical school and ultimately graduate as practising doctors (see Section 3.1 of this chapter). In addition to directly influencing patient health outcomes, a greater understanding of factors influencing or underpinning PPC therefore may also have educational implications, by allowing for educational interventions to be tailored and designed to target underperforming PPC students and potentially increase the effectiveness of their PPC prior to graduation. Several individual characteristics of have been proposed as potential influencers of PPC and will now be briefly summarised.

3.6.1   Gender

The gender of both doctor and patient has been proposed as a source of variation in PPC, with female doctors possibly facilitating a more equal and open exchange and creating a different therapeutic milieu than their male counterparts (Verbrugge and Steiner, 1981). Roter, Hall and Aoki (2002) systematically reviewed

and quantified effects of doctor gender on PPC in studies published between 1967 and 2001; they found that female doctors engaged in more psychosocial counselling, discussions and question asking, active-partnership behaviours, partnership building behaviour, positive talk and emotionally focused talk, such as agreement, encouragement and reassurance, than their male counterparts. No gender differences were found in the amount, quality or manner of biomedical information giving or social conversation, or in the amount of negative talk (defined as "*explicit verbal expressions of criticism or disapproval*" (Roter et al., 2002) pp761) present per consultation. Female doctors conducted significantly longer consultations and engaged in more positive non-verbal behaviours than males. Interestingly, no differences were found in patients' emotional talk (provision of cues and concerns) as a function of doctor gender, indicating that female doctors' tendencies to engage in more psychosocial, emotionally-focused consultations did not necessarily increase levels of patients' emotional disclosure. Hall and Roter (2002) further meta-analysed seven studies and found that doctor gender did not significantly affect patients' expressions of concern, worry and feeling, but that patients talked more and gave more biomedical and psychosocial information to female doctors rather than their male counterparts. Timmermans (2005) found that female oncologists gave higher empathic responses than male doctors to patients' utterances of psychosocial information, supporting the work of Del Piccolo (2012).

Interactions between patients' and doctors' genders may also impact on the communication of emotive issues, with the greatest number of empathic opportunities observed between female patient-doctor sex concordance dyads (Pollack et al., 2007). It is possible that patients' inherent gender stereotypes may result in patients having differing expectations of male and female doctors, which may in turn also affect the consultation (Hall, 2003). Gender has also been proposed as a contributory factor affecting medical students' PPC (Haq et al., 2005, Wiskin et al., 2004). Providers' gender may influence cue identification and responding and may account for individual variation in an individual's PPC when presented with the same cue stimuli; however the proportion of variance in providers' PPC explained by gender is likely to be minimal.

3.6.2   Providers' Psychological Characteristics

In addition to gender, it is important to consider the influence of providers' *psychological* characteristics on their PPC. Few studies have investigated individual differences in PPC, specifically providers' ability to recognise and respond to emotional distress, in either simulated or real patients, from a psychological perspective. However, consideration of the influence of psychological theories viewed from a medical education standpoint may provide a theoretical rationale for explaining individual differences in PPC (Flyvbjerg, 2001) and as such have greater educational and practice implications than consideration of gender alone.

Torre and colleagues (2006) discussed the ways in which medical education research should be grounded in theory and concluded by advocating that medical educators should consider different, context-dependent, theories and base their choice of theory on the specific learning outcomes and skills being researched and developed. This may be particularly pertinent when researching PPC. Whilst consensus as to the importance of PPC exists, little operational and conceptual clarity applies to the theory underpinning its development. PPC is a concept characterised by lack of unifying frameworks of study (De Haes, 2006), making implementation of Torre's recommendations difficult (Torre et al., 2006). Despite this, two psychological constructs can be considered to provide a theoretical perspective as to why medical students and doctors display different PPC behaviours when faced with the same situational stimuli: attachment theory and EI. Both can be investigated using reliable, valid and standardised tools and in this way form useful standpoints for the study of PPC. These psychological constructs will therefore form the basis of the research conducted within this thesis and will be discussed in Chapter 2 in more detail with reference to their conceptualisation, methods of measurement and relevance to PPC.

4   Summary of Chapter

Effective PPC is important for patients' health and well-being and for the delivery of high quality medical care (General Medical Council, 2009b, Maguire and Pitceathly, 2002). As such, effective PPC is outlined by regulatory bodies as a core component of clinical practice (Swing, 2007, Frank, 2005, Epstein and Hundert, 2002) and its principles are taught and assessed during undergraduate and

postgraduate medical education in the UK (Brown, 2008, Cherry, 2010, General Medical Council, 2012a). One aspect of effective PPC is the ability to identify signs of emotional distress in patients and respond in an appropriate manner, congruent with the patient's needs (Reynolds and Scott, 1999). This is a particularly salient factor when considering that patients rarely explicitly vocalise emotional distress and instead tend to hint to it during consultations (Butow et al., 2002); appropriate detection and handling of such emotion may be difficult (Zimmermann et al., 2007, Suchman et al., 1997, Heaven and Maguire, 1997) and requires both the doctor and patient to engage in emotive discourse. Lack of identification of, or inadequate responding to, patients' emotional distress has been shown to lead to a number of iatrogenic patient outcomes, including incorrect diagnoses or treatment and unnecessary referrals; patient satisfaction and trust in the doctor may also be negatively affected (Ong et al., 1995, Levinson et al., 2000, Bensing et al., 2010). It is therefore important to identify individual characteristics of doctors that may influence their PPC. Consideration of psychological theories viewed from a medical education standpoint may provide a theoretical rationale for explaining individual differences in PPC. Chapter 2 discusses two such theories of relevance - attachment theory and the theory of EI - with specific reference to their applicability to the study of individual differences in PPC.

Chapter 2: Theoretical Frameworks of the Research

1   **Introduction**

Chapter 1 highlighted that providers differ in their PPC, specifically their abilities to identify and respond to patients' cues of emotion. This disparity may result in iatrogenic outcomes for the patients of some providers and therefore it is important to identify characteristics of providers that may influence their PPC. Two such characteristics were briefly introduced in Section 3.6.2 of Chapter 1: providers' attachment styles, and their EI.

The purpose of this chapter is therefore to discuss these psychological constructs further. The conceptualisation of adult attachment and its theoretical application to the study of individual differences in PPC is discussed, followed by a similar discussion of EI. The chapter concludes by summarising the theoretical rationale behind applying attachment theory and EI to the study of PPC. A systematic review of the current state of the literature relating medical students' and doctors' attachment styles and EI to their PPC is then presented in Chapter 3, which concludes the first part of this thesis.

2   **Search Strategy**

The same principles of searching and selection of literature for this chapter were employed as in Chapter 1, including consulting the wider literature to contextualise the data discussed within papers; the search undertaken across Medline is presented in Table 2 for illustration. As with Chapter 1, searches were conducted in January 2012 and repeated during the writing of Chapters 4, 5 and 6 and prior to submission to check for new material. Relevant literature will now be discussed.

Table 2

Search Strategy for Chapter 2: Medline

Number	Term
1	Professional-Patient Relationship/ OR Physician-Patient Relationship/ OR Provider-Patient Relationship/
2	(verbal communication OR non-verbal communication OR non-verbal behaviour OR non-verbal behaviour OR communication OR consultation OR interview OR appointment OR visit OR encounter OR interaction OR cue* OR concern*).mp
3	1 OR 2
4	(Student* OR doctor* OR physician* OR provider* OR practitioner* OR clinician* OR therapist* OR psychologist* OR psychothera*OR nurs*).ab,ot,ti
5	3 AND 4
6	attachment.mp
7	attachment style/ OR emotional security/ OR mother-child relations OR attachment disorders/ OR attachment behavior/ OR attachment theory OR interpersonal interaction/ OR parent child relations/
8	6 OR 7
9	5 AND 8
10	(Emotional intelligence OR social intelligence OR caring OR compassion OR emotion* competence OR emotion* development OR emotion* management OR emotion* self-awareness OR emotion* regulation OR empathy*).mp
11	Empathy/
12	10 OR 11
13	5 AND 12
14	8 OR 9 OR 12 OR 13
15	Limit 15 to (english language and humans)

3   **Theoretical Frameworks of the Research: Attachment Theory**

3.1   **Introduction to Attachment Theory**

Attachment theory has gained recent interest in the field of healthcare as one means of understanding individual differences in the provision of PPC (Ciechanowski et al., 2002, Ciechanowski et al., 2006, Hunter and Maunder, 2001, Eells, 2001, Thompson, 1999, Dozier, 1990, Dozier et al., 1994, Dozier and Tyrell, 1998, Leiper and Casares, 2000). Attachment theory is a theory of psychosocial development whose main tenet is that all individuals form enduring patterns of behaviour through repeated internalisation of interactions with their primary caregiver(s) in childhood. These attachment patterns continue into adulthood and are particularly activated in times of vulnerability or stress (Ciechanowski et al., 2006). Attachment patterns strongly influence subsequent behaviour within certain adult relationships, such as care-giving or care-eliciting relationships (Adshead, 2010), in which one party displays neediness, dependence and vulnerability and seeks assistance from the other party. Attachment theory may provide a theoretical perspective for understanding individual differences in care-giving behaviours, such as PPC within a medical consultation. A brief outline of attachment theory, the relevance of its application to the study of PPC, and its limitations will now be described.

3.2   **Infant Attachment**

Attachment theory was first proposed by Bowlby (1969) who argued that attachment developed in order to protect infants by keeping them in close proximity to their caregivers (generally an infant's parents). Attachment promotes a survival advantage by providing the infant with a sense of security and by maintaining their proximity to a secure base for protection in times of perceived or actual threat (Bowlby, 1969). 'Attached' infants are *"...strongly disposed to seek proximity to and contact with a specific figure and to do so in certain situations, notably when he is frightened, tired or ill"* (Bowlby, 1969). The notion of attachment was further developed by Ainsworth (1978), who conceptualised attachment as acting continuously (i.e. not being context or situation specific) and in this way providing the infant with a secure base to explore the world. Through varying levels of accessibility, attunement and responsiveness to the infant's signals, caregivers shape

the infant's communication of distress, independence and reliance on others through the attachment mechanism (Cassidy, 1999).

Ainsworth (1978) identified three patterns of infant attachment, each typified by distinct patterns of infant behaviour upon separation and reunion with their caregiver(s): secure, anxious-resistant and avoidant attachment. Securely attached infants display exploratory behaviour in the presence of a caregiver, proximity-seeking behaviour when distressed and an ability to be willingly and readily comforted by their caregiver after a brief separation. Anxious-resistant infants display extreme distress and anger upon separation, an inability to be comforted upon reunion and ambivalent behaviour towards their caregivers. Avoidant infants are not distressed upon separation from their caregiver and do not seek (or may avoid) comfort or contact with their caregiver upon their return. In addition to Ainsworth's three patterns of childhood attachment, a fourth type of attachment, disorganised attachment, has since been described by Main and Soloman (1986), characterised by bizarre and inconsistent infant-caregiver interactions both prior to separation and post-reunion. These four attachment types are consistently referred to and reported in the study of infant attachment, with infants often further categorised into secure or insecure (anxious-resistant, avoidant and disorganised attachment) attachment categories.

An infant's early attachment is thought to significantly impact on their affective, cognitive and emotional development (Ma, 2006). The enduring impact of early attachment occurs as the infant internalises a sense of attachment security or insecurity. These early experiences are thought to influence the development of the neuronal cytoarchitecture in the neo-cortex. Through this process they become represented cognitively in the brain as an 'internal working model' (IWM) of attachment, a complex schema of attitudes, beliefs and learned behaviours towards attachment relationships (Bartholomew and Shaver, 1998). Application of the IWM to subsequent infant-caregiver interactions results in learned patterns of behaviour, which are generaliasable to other interpersonal interactions and relationships throughout life (Daniel, 2006, Bowlby, 1969, Salmon and Young, 2009). Kramer (1992) refers to the IWM of attachment as *"the caregiver icon"*, describing it as becoming engaged when the individual is placed in an interpersonal relationship in which care elicitation or care provision is required. The attachment IWM underlies

and influences attachment relationships in terms of the individual's perceptions of needs and their expectations and is self-perpetuating, as through repeated interactions, new experiences are organised within the existing IWM. In this way, the attachment IWM and therefore attachment is thought to be relatively stable throughout life (Bowlby, 1973, Ainsworth, 1982). Longitudinal research supports the stable nature of attachment, often over several decades (Maunder and Hunter, 2008) and the notion of adult attachment is now accepted by theorists and researchers as a continuation of infant attachment.

3.3   **Adult Attachment**

The conceptualisation of adult attachment was developed and distinguished from infant attachment by both developmental and social psychologists, forming two distinct traditions of research. Both argue that attachment processes develop in early childhood, continue to adulthood and are characterised by generalised thoughts, feelings and expectations about behaviour within attachment relationships (Daniel, 2006, Ainsworth, 1989). However, they differ in how they measure and conceptualise adult attachment.

Developmental approaches to adult attachment - the 'parenting' tradition (Ma, 2006) - consider the cyclical process of attachment, in that they are concerned with the ways in which adult attachment influences parenting behaviour and consequently the attachment of the infant in question. Social or personality psychology approaches to adult attachment - the 'romantic attachment' tradition (Ma, 2006) - are based on observations that adults generally behave in romantic and close general relationships in ways that are similar to those observed by Ainsworth in infancy (Fraley, 2010). Social psychologists therefore view early attachment experiences as precursors to the ways that adults conceptualise and conduct relationships later in adult life (Hazan and Shaver, 1987).

There is a lack of clarity regarding the degree of convergence between the models used by each tradition - see Shaver and Mikulincer (2002) for a more detailed overview. Bartholomew and Shaver (1998) reinforce the need to view each separately; the romantic tradition focuses on experiences in adult relationships and the respective measures are self-report, aimed to gather conscious reports of an individual's life experiences and behaviour in close relationships. By contrast, the

parenting tradition focuses on an individual's childhood experiences with their parents and how this is subsequently translated into their own parenting behaviour. Information is gathered through the Adult Attachment Interview (Main and Goldwyn, 1988), which encourages open discussion of an individual's childhood. Judgement of adult attachment is determined based on terms used to discuss childhood and subjective preoccupation with attachment needs. In this way, assessment is made on information that may not necessarily be consciously known to the individual (Bartholomew and Shaver, 1998). It is therefore unsurprising that a lack of convergence between romantic and parenting tradition models of adult attachment has been reported; it is argued that choice of model should be made based on how the researcher wants attachment to be conceptualised (Bartholomew and Shaver, 1998). The romantic tradition model is thought to provide a diathesis-stress perspective on attachment relationships, with attachment "*related to less collaborative interactions in individuals who appraised the interaction as stressful to begin with*" (Crowell et al., 2008). The romantic tradition conceptualisation of adult attachment is considered in this thesis, therefore the parenting tradition will not be discussed further and the romantic tradition conceptualisation of adult attachment will simply be referred to as adult attachment from this point forward.

3.4   Measurement of Adult Attachment

Self-report measures of adult attachment can either assess attachment categorically, or dimensionally. The first to conceptualise adult attachment categorically were Bartholomew and Horowitz (1991), who proposed a four-category classification of adult attachment (see Figure 1).

Figure 1

The Four-Category Model of Adult Attachment
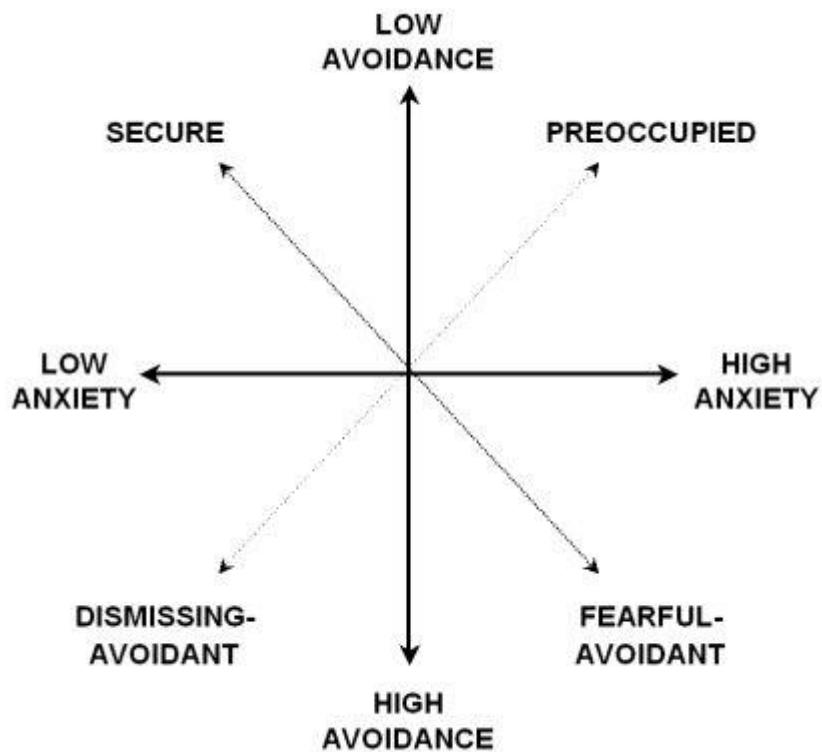
Bartholomew and Horowitz (1991) stated that adult attachment can be defined in terms of scores on two dimensions: attachment anxiety, in which high anxiety is characterised by habitual preoccupation and over involvement in close relationships combined with a fear of abandonment, and attachment avoidance, in which high avoidance is characterised by a difficulty in trusting others, devaluation of close relationships and an avoidance of intimacy (Collins and Feeney, 2000). Individuals can be classed into one of four attachment categories based on axis scores, each representing a theoretical prototype, but can also be viewed with regards to scores on attachment avoidance and attachment anxiety dimensions. Securely attached individuals have low attachment avoidance and low attachment anxiety. They are able to seek support from others and communicate their needs and find others accessible and responsive during times of need (Bartholomew and Horowitz, 1991). Furthermore, they are comfortable labelling, identifying and experiencing felt emotions (Larose et al., 1999). Adults with preoccupied attachment have low attachment avoidance and high attachment anxiety. They display strong dependency

on others to maintain positive self-regard, desire for social contact that is inhibited by fear of rejection and tendency to seek close relationships to meet security needs. They exhibit "*ready access to painful memories and a paradoxical cognitive closure in response to positive affect induction*" (Lanciano et al., 2012). Dismissing-avoidant individuals have low attachment anxiety and high attachment avoidance. They display avoidance of closeness with others due to negative expectations, denial of the value of close relationships, discomfort in trusting others and detachment from emotion and need for others when distressed (Tan et al., 2005, Ciechanowski et al., 2004, Bowlby, 1969, Bowlby, 1973). Finally, fearful-avoidant individuals have both high attachment anxiety and high attachment avoidance. They display mistrust of themselves and others, dependence on others for self-worth and avoidance of relationships due to negative expectations of others (Ciechanowski et al., 2004, Dozier et al., 1994). Both dismissing-avoidant and fearful-avoidant individuals also exhibit defensive exclusion of painful thoughts or memories (Lanciano et al., 2012).

Approximately 50% of individuals can be categorised as securely attached, based on the four-category attachment model (Ciechanowski et al., 2006). However, as the categories proposed by Bartholomew and Horowitz (1991) are prototypical, individuals may transist two attachments (by scoring on the axis of avoidance/anxiety) and therefore may not fit exactly into one attachment category. In addition, by classifying individuals into one of four categories, the four-category model of adult attachment assumes individual differences within categories are redundant (Mikulincer and Shaver, 2007, Daniel, 2006) and that categories are mutually exclusive (Collins and Read, 1990). It is now widely advocated that questionnaires to measure adult attachment be scored dimensionally[12] where possible, an approach which has been found to be more psychometrically robust than categorical measurement and to provide greater information for research purposes (Bartholomew and Horowitz, 1991, Shaver and Mikulincer, 2002).

By employing self-report tools to assess adult attachment, the social psychology approach has been criticised for not measuring unconscious aspects of attachment-related defences and behaviour, instead reporting only cognitive,

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[12] Scoring dimensionally refers to summing the responses of questionnaires in a way advocated by the test authors so as to obtain a score for each of the two attachment dimensions: attachment avoidance and attachment anxiety. Dimensional scoring is an alternative to categorising participants into one of the four prototypical attachment dimensions.

conscious assessment of feelings and behaviour (Smith et al., 2010). However, it is argued that adults generally have a level of awareness sufficient to self-report their conscious and unconscious emotional experiences, and are capable of recalling this information (Ma, 2006). It is recommended that dimensional self-report measures, such as the Experiences in Close Relationships: Short Form questionnaire (ECR:SF) (Wei et al., 2007), be used to measure attachment if the focus of the research is on relationship-related communication, emotions and behaviour under stressful circumstances (Crowell et al., 2008).

3.5   **Relevance of Attachment Theory to the Care Relationship**

As attachment patterns move from solely infant-caregiver relationships to gradually reside within the individual in adulthood, the single-caregiver attachment of childhood changes to span a number of attachment relationships (Smith et al., 2010). The attachment IWM is thought to be particularly activated in care-giving or care-seeking relationships, such as the patient-provider relationship (Ainsworth, 1989, Bartholomew, 1990). In such relationships, attachment styles may account for individual differences in interpersonal behaviour emotionally, behaviourally and motivationally.

Attachment styles influences lay people's care-oriented feelings and care-giving behaviours, with securely attached individuals being more likely to engage in such behaviours than insecurely attached individuals (Mikulincer et al., 2005). Relationships have been identified between secure attachment styles and individuals' abilities to provide care for others when in need (Shaver and Mikulincer, 2002); such individuals demonstrate consistently different psychological experiences of care-giving than insecurely attached individuals (Adshead, 2010) and show greater levels of empathic care (Cassidy and Shaver, 2008, Gillath et al., 2005). Securely attached individuals rely more on positive emotional regulation strategies than their insecurely attached counterparts, which in turn reduce their own distress and increase both their confidence in dealing with the issues or concerns of others and the subjective value placed on such experiences (Mikulincer et al., 2005). They are able to flexibly and suitably adjust to emotional experiences by acknowledging and tolerating distress without becoming overwhelmed with emotions (Lanciano et al., 2012, Cooper et al., 1998). Whilst securely attached individuals' stress management

and coping strategies promote relationship maintenance and communication, insecurely attached individuals often employ strategies aimed at either deactivating or hyper-activating the attachment system, both of which are detrimental to provision of care and effective communication (Lanciano et al., 2012). Individuals scoring high on attachment anxiety typically use hyper-activating strategies, such as wishful thinking, self-blame and rumination, which consequently result in hyper-vigilance towards negative emotion (Lanciano et al., 2012). Conversely, individuals scoring high on attachment avoidance typically use deactivating strategies, such as emotion-focused coping, in order to limit accessibility to distress (Lanciano et al., 2012). Over-emphasis on emotional cues or emotional suppression, diverting attention and focus from emotionally-laden material or masking or inhibition of nonverbal emotional expressions are strategies typical of insecurely attached individuals (Mikulincer and Shaver, 2003) and are behaviours that reinforce an insecure attachment IWM. By practising such behaviours, it decreases the likelihood of positive emotional experiences being integrated into cognitive structures and therefore being used in information processing and social interaction. This has implications for an individual's behaviour within subsequent attachment relationships (Mikulincer and Shaver, 2003).

Bowlby (1988) was the first to propose the relevance of applying adult attachment theory to the care-giving relationship in a clinical setting by conceptualising the provider as a secure base from which the patient is able to explore and reassess their IWM of attachment. This was initially posited to occur within the therapist-client relationship and as such, much of the published research into PPC and attachment has developed from and been conducted in psychotherapy settings. Since Bowlby's early conceptualisation, research has also suggested the role of attachment in understanding behavioural difficulties within psychiatric settings (Adshead, 1998) and in fostering the therapist-client therapeutic relationship (Ma, 2007). Research into attachment in medical settings has indicated the influence of patients' attachment styles on such factors as on medication adherence and willingness to access and accept support (Ciechanowski et al., 2001). In such studies, the provider is generally referred to as a 'secure base' or 'attachment figure', with little exploration as to the influence of providers' attachment on their ability to communicate (Adshead, 2010, Goodwin, 2003), specifically their ability to

accurately and sensitively respond to individual patients' needs and emotive issues (Tan et al., 2005).

In a clinical setting, the relationship between attachment styles and care-giving behaviours may be more complex. Daniel argues the complexities associated with the relationship between providers' attachment styles and the therapeutic alliance make it "*...less straightforward than the relationship between client attachment patterns and alliance*" (Daniel, 2006) pp. 977. Dozier, Cue and Barnett (1994) studied the relationship between therapists' attachment styles and their ability to respond therapeutically to patients' needs. Insecurely attached therapists were less likely and less able to respond to patients' outwardly displayed needs and generally displayed superficial intervention behaviours, thus avoiding patient conflict issues (Dozier et al., 1994). In contrast, securely attached therapists had greater flexibility of strategies to manage difficult situations and were more willing to interact with patients in a way which made themselves feel uncomfortable (Dozier et al., 1994). In a subsequent study, Dozier and Tyrell (1998) report providers' difficulties in providing effective interventions for their clients if they have high levels of attachment avoidance or anxiety, a finding independent of the client's own attachment style. Similarly, Berry reported a positive association between psychiatric care providers' secure attachment styles and their therapeutic relationship quality with patients experiencing episodes of psychosis (Berry et al., 2008). The authors concluded that insecurely attached providers experience difficulties in making psychological inferences related to others' behaviours, thus highlighting the role of the provider's attachment style in the communication of emotional or psychosocial patient issues (Berry et al., 2008). Indeed, research suggests that application of an attachment IWM characterised by difficulty in trusting others, devaluation of close relationships and an avoidance of intimacy (attachment avoidance) or by habitual preoccupation and over involvement in close relationships combined with a fear of abandonment (attachment anxiety) results in ineffective PPC and negatively impacts on the therapeutic alliance and patient-provider relationship (Berry et al., 2008, Dozier et al., 1994, Dozier and Tyrell, 1998).

3.6 Relevance of Attachment Theory to Patient- Provider Communication in Medicine

Attachment theory therefore provides a theoretical framework for the study of individual differences in medical students' and doctors' ability to offer care. Viewed through a broader lens, the notion of mental schema[13] has been proposed as one means of explaining differences in medical students' learning of PPC (Kinderman and Humphris, 1995). It is thought that specific processes are involved in the assessment and analysis of social information. That information is processed in line with relevant pre-existing mental schema of action, which in turn guide subsequent behaviour. Schema are generally thought to consist of knowledge related to understanding of situations, available options within situations and understanding of the consequences of these options (Kinderman and Humphris, 1995). Individuals with readily accessible mental schema related to effective PPC skills may therefore be better able to communicate flexibly when presented with a situation requiring such behaviour than those whose mental schema are fewer, less developed or less readily available (Andersen and Chen, 2002). Kinderman and Humphris (1995) argue that skilled communicators have a wider range of cognitive schema available to assist with decision making and problem solving, and that they possess the ability to integrate new experiences into existing schema due to the sheer volume of available schema. In this way, skilled PPC becomes a reinforcing cycle - an individual draws on previously successful PPC strategies from existing schema and, through the process of forethought, vicarious learning, self-regulation and self-reflection, integrate current new experiences within schema, thereby cementing effective PPC strategies. Extrapolating these findings to attachment styles, it can be hypothesised that as securely attached individuals have a positive IWM of attachment relationships, they may therefore be better able to progress to skilled communicator level during undergraduate medical education than their insecurely attached counterparts. This is characterised not only by effective PPC skills but a knowledge and understanding of the importance of PPC and an ability to flexibly modify skills as a consequence of unforeseen influences in a given situation (Hargie and Dickson, 2011).

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[13] Mental schema are hierarchically organised systems consisting of information and knowledge relating to mental representations of situations, people, objects or events which subsequently guide social interactions

Medical students' or doctors' IWMs of attachment relationships may therefore account for some variation in the differences in PPC outlined in Section 3.5.1 of Chapter 1, particularly their abilities to acknowledge and respond to patients' cues. Individuals' IWMs will be subject to considerable variability as a function of their early childhood experiences (Kraemer, 1992), therefore potentially accounting for the range of behavioural and affective responses observed in individuals when provided with the same cue stimulus. Attachment theory is advocated as one means of understanding individual differences and authenticity in medical students' and doctors' PPC (Salmon and Young, 2009), with attachment proposed as one factor (consciously or unconsciously) influencing the value that individuals place on long term relationships and interactions with patients (Webber, 1999, Ciechanowski et al., 2004, Ciechanowski et al., 2006). Attachment theory therefore forms the first theoretical framework underpinning the empirical research conducted and reported within this thesis.

3.7   Educational Implications and Limitations of Applying Attachment Theory to the Study of Patient- Provider Communication

Based on the literature outlined above, it is necessary to consider the educational implications of applying attachment theory to the study of PPC. Viewed from an educational context, Wilkinson (2003) argues that all doctors should have an awareness of the influence of their own attachment styles on their practice and clinical behaviour, and stresses that teaching about the influence of attachment should take place during undergraduate medical education. However, attachment styles are characterised by relatively stable and enduring IWMs of attachment relationships, based on learned patterns of behaviour, and it is generally accepted that an individual's attachment style cannot easily be altered (Maunder and Hunter, 2008). The potential for modification or development of attachment styles throughout undergraduate and postgraduate medical education is therefore limited, which is an important consideration given the potential influencing role of attachment theory on PPC, outlined above. It is therefore pertinent to consider the overarching influence of attachment styles on other characteristics of medical students and doctors that may also influence their PPC, but which are of a developmental nature and therefore can be enhanced and developed throughout undergraduate medical education. One such attribute may be an individual's ability

to manage, monitor and regulate their own and others' emotions, known as their EI[14]. EI therefore forms the second theoretical framework underpinning this thesis and will now be discussed with reference to its conceptualisation, methods of measurement and relevance to PPC.

4   Theoretical Frameworks of the Research: Emotional Intelligence

4.1   Introduction to Emotional Intelligence

EI describes the set of skills relating to effective perception of, interpretation of, and reaction to, emotional signals from both oneself and others (Salovey and Mayer, 1990). It encompasses the abilities to perceive, appraise and express emotion, to access and generate emotions when required and to regulate and understand emotions (Elam, 2000). There has been a recent shift in interest regarding the role of EI in medicine (Stoller et al., 2013, Chew et al., 2013, Lewis et al., 2005), particularly as an attribute in fostering the patient-provider relationship due to its links with interpersonal competence (Grewal and Davidson, 2008) and its developmental nature (Cherry et al., 2012, Fernandez, 2007, Sattersfield and Hughes, 2007). EI may therefore provide a complimentary theoretical perspective to attachment theory for understanding individual differences in providers' PPC. A brief outline of EI, the relevance of its application to the study of PPC, and its limitations will now be discussed.

4.2   What is Emotional Intelligence?

Research into the assessment and measurement of non-cognitive, socially competent behaviour is not new (Thorndike, 1920, Hunt, 1928, Moss and Hunt, 1927). However, it was not until 1990 that support and research interest began to be paid to the skills of understanding and managing other people to facilitate social interactions, collectively conceptualised as an individual's 'EI' (Salovey and Mayer, 1990). Salovey and Mayer (1990) proposed a social interaction model of EI, as an explanation for why some individuals possess a greater capacity than others to process emotional information and to use such information to guide their thoughts and behaviours. Prior to continuation of the discussion of EI, it must be stressed that the word 'emotional' in the term 'EI' relates to moods as well as emotions, and thus

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[14] Emotional intelligence

the term 'emotions' will be used to refer to both constructs from here on in to maintain consistency with other literature.

EI was initially defined as "*a type of social intelligence that involves the ability to monitor one's own and other's emotions, to discriminate among them and to use this information to guide one's own thinking and actions*" (Salovey and Mayer, 1990) pp189. This early definition of EI was later acknowledged by Mayer, Salovey and Caruso (2008) as being too broad, leading researchers to misinterpret EI as a blanket term for interpersonal skills. They refined the definition to encompass the abilities to perceive emotion, integrate emotion to facilitate thought, understand emotions and regulate emotions to promote personal growth (Mayer and Salovey, 1997). This revised conceptualisation of EI also included verbal and nonverbal appraisals of emotion, regulation of emotion in self and other, and use of emotional content in problem solving; The term 'EI', then, referred to a skill set including empathy, problem-solving, optimism and self-awareness. It came to be considered as a developmental feature of intelligence, loosely proportional to general mental abilities, which increases with age and past experiences (Mayer and Salovey, 1997).

4.3   Development of Emotional Intelligence

An individual's EI develops partly as a function of their attachment; one of the functions of infant attachment is to provide individuals with mechanisms by which they can regulate emotional arousal, particularly of emotions that are disturbing or overwhelming (Cassidy and Shaver, 2008). In early childhood, through repeated open discussion and parental acceptance of their infant's feelings, the infant's developing emotional self-awareness is further nurtured, resulting in the growth of competent, flexible skills for self-regulation of emotion. Direct links between attachment and emotional outcomes have been reported; securely attached infants spontaneously talk about their emotions in everyday conversation (Cassidy and Shaver, 2008) and use conversation with their parents as a forum for discussion of emotion and emotional management, and to foster emotional regulation growth (Wareham and Salmon, 2006). They display a greater understanding of emotion than insecurely attached infants (Cassidy and Shaver, 2008) and are better at identifying emotion, particularly negative or mixed emotions, in others (Weinfield et al., 2008).

This continues into adulthood, with securely attached adults displaying emotional regulation strategies that minimise stress and emphasise positive emotions (Mikulincer et al., 2001). Whilst these processes may not be conscious, insecurely attached adults experience less positive and more negative emotions on a daily basis, and are more likely to suppress their emotions in interpersonal contexts than securely attached adults (Feeney, 1995). An individual's attachment style and developmental level of emotional self-regulation and management, components of their EI, are therefore not mutually exclusive; both consist of cognitive and affective components and are shaped by previous learned experiences regarding interpersonal situations. An individual's conscious behavioural strategies with regards to emotion-provoking situations can be viewed as unconscious plans, guided both by their IWMs of attachment and their emotional self-regulation and management. These simultaneously and reciprocally influence cognition and behaviour.

Attachment influences aspects of individuals' social and emotional development, such as their abilities to manage emotions (Krikorian, 2002), their interpersonal skills (Mikulincer and Nachshon, 1991), their expressivity and disclosure (Mikulincer and Nachshon, 1991), their conversational regulation (Kobak and Hazan, 1991), their conflict resolution skills (Levy and Davis, 1988) and their interpersonal sensitivity (Anders and Tucker, 2000). However, in contrast to an individual's attachment style, which is perceived as resistant to revision and change throughout the life course (West and Sheldon-Keller, 1994), their EI is developmental, increasing with age and experience (Mayer et al., 2002). EI has been found to mediate the relationship between insecure attachment styles and outcomes including brooding rumination and mother-infant bonding problems (Lanciano et al., 2012, Gunning et al., 2011), indicating the complex interplay between attachment styles, EI and behavioural outcomes.

4.4   Models of Emotional Intelligence

Since Salovey's initial conception, a number of alternative definitions of EI have been proposed (Goldenberg, Matheson et al. 2006). Davies and Stankov (1998) and Law, Wong and Song (2004) defined EI as an abstract concept with four salient constructs: appraisal and expression of emotion in self; appraisal and recognition of emotion in others; regulation of emotion in self; and the use of emotion to facilitate

performance. Bar-On (1997) defined EI as a series of non-cognitive skills, abilities, competencies and capabilities that allow individuals to cope better with environmental pressures. Kasman, Fryer-Edwards and Braddock (2003) defined EI as "*the means to perceive and express emotions and regulate emotions in self and others*".

These multiple conceptualisations of EI may, at first glance, seem to 'blur' it as a construct. However, research traditions converge to enable models of EI to be broadly split into two theoretical frameworks (Spielberger, 2004): ability models, such as Salovey and Mayer's model, are extensions of information-processing theories of intelligence and therefore conceptualise EI as an 'intelligence'. In ability models, EI is viewed as the set of cognitive abilities required to accurately perceive, understand, use and manage emotional information (Goldenberg, Matheson et al. 2006) and is seen as a further dimension of intellectual competence not considered by traditional conceptualisations of intelligence. In mixed (dispositional) models, such as Goldman's model (1998) and Bar-On's model (1997), and trait models, such as Petrides' model (2007), EI is not viewed as an 'intelligence' in the traditional sense of the word, but rather is viewed as a set of interrelated competencies, skills, abilities, personal qualities and personality traits. There is some overlap between the principal components of current models; irrespective of conceptual orientation, it is generally agreed that EI is a multidimensional construct containing both cognitive and affective elements, consisting of the ability to recognise, deal with, and apply emotional information to everyday decision making and behaviour. Table 3, on page 48, shows the facets of four of the most widely researched models.

Literature is divided as to whether models of EI conceptualise abilities or preferred ways of behaving or personality traits, separate from general intelligence. Whilst some researchers argue that EI and personality are "*more highly correlated than many researchers would prefer*" (Van Rooy and Viswesvaran, 2004), the degree of correlation between the two constructs differs between different models of EI. For example, strong correlations between dispositional models of EI and dimensions of personality have been reported (Brannick et al., 2009, Shulman and Hemenover, 2006); a large amount of the variance in self-report trait measures of EI is shared with measures of empathy and well-established personality traits such as extroversion (Davies and Stankov, 1998). Unsurprisingly, given their

conceptualisation, a limited degree of overlap has been found between measures of personality and the measure designed to assess ability-based EI[15] (Ciarrochi et al., 2000). Researchers argue that the ability-based model of EI be the only model seen as truly distinct from personality traits and transient health states (Brannick et al., 2011, Brackett and Salovey, 2006, Mayer et al., 2003, Marquez et al., 2006, Lopes et al., 2003, Law et al., 2004, Van Rooy and Viswesvaran, 2004) given that it follows on from previous information-processing theories of intelligence, and therefore that it should be treated accordingly.

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[15] The Mayer-Salovey-Caruso Emotional Intelligence Test (MSCEIT), which is discussed further in Section 3.6.1.2 of Chapter 5

Table 3

Summary of the Main Models of Emotional Intelligence

Model	Theoretical framework	Main components	Measurement tool	Overlap with personality, general intelligence and other EI models of EI
Mayer and Salovey's four branch model	Ability-based model	Four branches (perception of emotion, use of emotion to facilitate thinking, understanding emotion, management of emotion)	The 141-item Mayer-Salovey-Caruso Emotional Intelligence Test (MSCEIT)	MSCEIT scores show: • Little/ no overlap with neuroticism, extraversion and conscientiousness (Brackett and Mayer, 2003, Lopes et al., 2003) • moderate association with agreeableness and openness (Brackett and Mayer, 2003) • sufficient discriminant validity with general intelligence (Lopes et al., 2003). • low /moderate correlations with dispositional self-report measures of EI (Brackett and Salovey, 2006)
Goleman's five dimensional model	Mixed (dispositional) model	Five dimensions (self-awareness, self-regulation, motivation, empathy, social skills)	The 72-item Emotional and Social Competence Inventory, Version 2 (ECI-2)	ECI-2 scores show: • moderate/high association with extraversion, openness and conscientiousness (Murensky, 2000) • little/no overlap with neuroticism and agreeableness (Murensky, 2000) • sufficient discriminant validity with general intelligence (Byrne et al., 2007) • moderate overlap with dispositional self-report measures of EI (Byrne et al., 2007)

Table 3 Continued

Model	Theoretical framework	Main components	Measurement tool	Overlap with personality, general intelligence and other EI models of EI
Petrides' trait model	Trait model	Twelve facets (adaptability, assertiveness, emotion perception (self/others), impulsiveness, self-esteem, self-motivation, social awareness, stress management, trait empathy, trait optimism)	The 153-item Trait Emotional Intelligence Questionnaire (TEIQue)	TEIQue scores show: • high association with neuroticism, extraversion and conscientiousness (Petrides et al., 2010) • moderate association with openness and agreeableness (Petrides et al., 2010) • moderate overlap with general intelligence (Petrides, 2009) • high association with dispositional self-report measures of EI (Davies and Stankov, 1998)
Bar-On's EQ-i model	Mixed (dispositional) model	Five subscales (intrapersonal EI, intrapersonal EI, stress management, adaptability, general mood)	The 133-item Bar-On Emotional Quotient Inventory (Bar-On EQ-i)	EQ-i scores: • are significantly predicted by personality traits (Grubb and McDaniel, 2007) • show sufficient discriminant validity with general intelligence (Derksen et al., 2002) • highly correlate with dispositional self-report measures of EI (Davies and Stankov, 1998)

4.5 The Four-Branch Ability Model of Emotional Intelligence

The applicability of EI to medicine has been criticised due to the lack of conceptual clarity surrounding what EI actually is (Lewis et al., 2005). EI, emotional quotient and emotional competence are often used interchangeably in the literature, posing Lewis to challenge whether EI is an idea, a theoretical construct or a measure. She concluded that, because EI rests on assumptions, clarity is needed in its conceptualisation in order for it to provide a useful base for the study of interpersonal attributes in medicine (Lewis et al., 2005). Therefore, as conceptualisation and measurement of EI differs based on the researcher's choice of theoretical model, explanation of the rationale behind the choice of model must be provided before useful interpretation of any findings can be made. The research reported in this thesis is underpinned by Mayer and colleagues' four-branch ability model of EI (Mayer et al., 2000), and this model will therefore now be discussed in more detail.

Mayer and colleagues (2000) four-branch ability model of EI conceptualises EI as consisting of four discrete emotional abilities, divided into four 'Branches', as shown in Figure 2.

Figure 2

The Four-Branch Ability Model of Emotional Intelligence
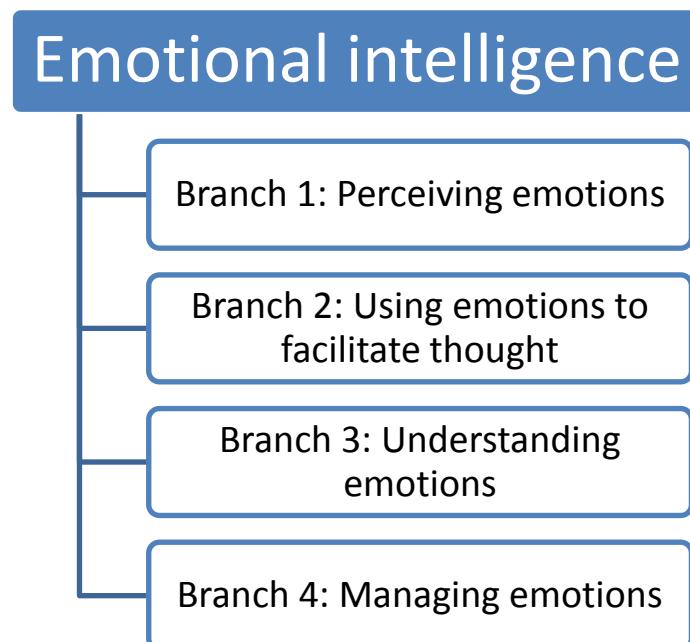
The four branches are arranged from lower, more molecular skills[16] to higher molar skills[17] (Mayer et al., 2000). The lowest Branch (Branch 1) concerns the ability to perceive and express emotion. The second Branch (Branch 2) involves assimilating basic emotional experiences into thinking, which develops through maturation. The third Branch (Branch 3) involves the understanding and reasoning behind emotions, including an understanding of the continuum of emotional intensity and how to best reason about emotion accordingly. The fourth and highest Branch (Branch 4) involves the management and regulation of emotion in oneself and others. Mayer and Salovey state that the four branches are "*arranged from more basic psychological processes to higher, more psychologically integrated processes. For example, the lowest level branch concerns the (relatively) simple abilities of perceiving and expressing emotion. In contrast, the highest level branch concerns the conscious, reflective regulation of emotion*" (Mayer and Salovey, 1997). Lower level abilities are thought to emerge relatively early in development and people "*high in emotional intelligence are expected to progress more quickly through the abilities designated and to master more of them*" (Mayer and Salovey, 1997). In this way, EI can be seen as a developmental ability. These abilities, or Branches, are measured using the 141-item Mayer-Salovey-Caruso Emotional Intelligence Test (MSCEIT), which is summarised in Table 3 on page 48 and discussed in more detail in Section 3.6.1.2 of Chapter 4. It is important, at this point, to stress that an individual's EI, as conceptualised using Mayer and colleagues' four-branch model of EI (2000), is distinct from their predisposition to experience certain *types* of emotions. Rather, this predisposition is related to the personality traits of positive and negative affectivity (George, 1996, George, 2000). Also, it must be noted that an individual's EI does not relate to how *intensely* they experience emotions. Instead, the four-branch model of EI taps into the extent to which an individual's cognitive capabilities are informed by their emotions, and the extent to which emotions are cognitively managed (George, 2000).

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[16] Molecular skills is a term used to refer to 'fine-grained' component processes involved in cognition
[17] Molar skills are gross or higher-order cognitive processes, comprised of multiple specific, molecular elements

4.6 Relevance of Emotional Intelligence to the Study of Patient-Provider Communication in Medicine

EI influences lay people's interpersonal behaviours and communication. The benefits to the general population of having high levels of EI were popularised by Daniel Goleman's seminal book (1996), in which he drew from his dispositional model of EI. Since this early conceptualisation, associations between EI, measured using a variety of models, and a number of positive outcomes have been reported. For example, high EI positively influences individuals' abilities to identify others' emotional expressions and makes people more satisfied with their interpersonal relationships, more flexible in social interactions, better able to manage their moods and more adaptable when under stress (Ciarrochi et al., 2000, Lopes et al., 2004, Ciarrochi et al., 2002, Birks and Watt, 2007). EI is also an attribute of good leaders and teamworkers (Prati et al., 2003); it is positively associated with psychological wellbeing (Martins et al., 2010) and even orgasmic frequency in women (Burri et al., 2009). The popularisation of EI as "*mattering more than IQ*" (Goleman, 1996) has promoted it as being perceived as a crucial attribute for successful psychological and social functioning.

Lopes (2005) argues that EI is an important tool for social interactions given the role that it plays in conveying information about individuals' thoughts and intentions; successful social interactions require both parties to be able to process emotional information and manage emotional dynamics. Abilities in perceiving emotion, using emotion to facilitate thought and understanding emotion are thought to impact on interpersonal communication *indirectly*, by providing a mechanism by which to interpret social cues and guide emotional self-regulation and behaviour (Lopes et al., 2005). In contrast, ability to manage or regulate emotion has been highlighted as the most important Branch of EI in interpersonal communication due to its role in "*modulating emotional experiences to attain desired affective states and adaptive outcomes*" (Lopes et al., 2005). Research links effective emotional self-regulation and abilities in flexibly focusing attention (Lopes et al., 2005), applying effective social interaction strategies (Furr and Funder, 1998, Langston and Cantor, 1989), making effective decisions when under stress and managing stress levels effectively (Lopes et al., 2005). Whilst the other, lower Branches of EI may indirectly impact on interpersonal communication, emotional management is thought

to be the most likely proximal predictor of the quality of social interactions (Lopes et al., 2005).

The influence of EI may be even more important in clinical settings given that medical students and doctors are emotionally challenged by their encounters with patients (Levinson, 1993, Hall et al., 1993, Hall et al., 2002). Medical students consistently say they are anxious about communicating with patients who are angry, crying, in pain or displaying emotional distress (Peters et al., 2011, Hajek et al., 2000), indicating they are unsure how to react to the emotions of patients who are behaving in a manner incongruent with a medical framework. An investigation of third-year medical students concluded that their affective state was as much of an influence on their medical decision making as their level of effort and concern invested in understanding patients' problems (Isen et al., 1991), indicating the need for them to be able to manage and respond to their own, and others', emotions.

Medical training is recognised as a high pressure, demanding and stressful period (Philips, 2008), which can have negative effects on the psychological well-being and mental health of medical and dental undergraduate students (Gorter et al., 2008, Humphris et al., 2002, Guthrie et al., 1998). Pitkala (2004) highlights the perceived need for students to become emotionally detached from their patients' situations in order to 'survive' undergraduate medical education from an emotional standpoint. Indeed, in order to manage the emotional and cognitive challenges of undergraduate medical education, deal with the uncertainties of medical diagnosis and treatment, recognise patients' emotional, psychological and psychosocial issues and deal with the stressors of workplace learning and clinical placements, medical students must be aware of the role of emotions in aiding their coping and survival throughout their years as a student and practitioner.

Brewer and Cadman (2000) identify five domains in which EI "*determines one's capacity to develop key skills and competencies*": self-awareness, self-regulation, motivation, empathy and social skills. They hypothesise that those who are more 'emotionally intelligent' are better placed to deal with the stresses of medical education and cope better academically and clinically (Brewer and Cadman, 2000). Emotional experiences may also impact on students' learning. For example, Dornan (2007) proposes the need for development of emotional competencies in

addition to knowledge and abilities in order to reinforce students' learning, which tends to support their hypothesis.

The importance of EI is not limited to undergraduate medical education. For example, consider the example of a doctor breaking the news of the death of a patient due to his own misjudgement of the clinical situation to the patients' relatives. The doctor has to appraise the relatives' shock and anger about the death and decide *how* to, and indeed *whether* to, also express his own self-pity, fear and disappointment to them. The importance of doctors being able to self-regulate their emotions was highlighted by Roter, Frankel, Hall and Sluyter (2006), who argued that "*personal awareness training, clinical supervision, and individual therapy may be useful in helping physicians more accurately identify transference [the process by which strong patient emotions are passed onto the doctor] in their patients and better understand their own motivations and tendencies in this regard*". Doctors who are accurately able to elicit and recognise emotions may be better able to make diagnoses and judge appropriate treatment pathways (Roter et al., 2006); indeed, some authors assert that awareness of one's own feelings is a prerequisite for insights into the feelings of others and an indication of empathic ability (Matthews et al., 2004, Roter et al., 2006).

The ability to convey emotional messages as intended and accurately recognise others' emotions has been investigated empirically within patient-doctor relationships (DiMatteo et al., 1980, Friedman et al., 1980). Patients describe doctors who are more skilled at emotional encoding as listening more and being more caring and sensitive than their less skilled counterparts. Also, doctors' abilities to accurately identify and decode their patients' body movements increases patients' satisfaction, indicating the impact of these skills on both doctor-level and patient-level outcomes. This notion has been supported empirically and the mediating effect of EI on providers' stress levels and burnout is well documented (Weng et al., 2011b, Nooryan et al., 2012, Arora et al., 2011, Por et al., 2011, Birks et al., 2009). The five domains of EI discussed by Brewer and Cadman (2000) also map onto traits associated with PPC and patient satisfaction, including sensitivity to patients' concerns and provision of reassurance and support (Berrios-Rivera et al., 2006). Matthews, Zeidner and Roberts (2004) express concerns that high EI may be a skill appropriate only to those involved with emotional content on a daily, professional

basis, and therefore EI was chosen as the second theoretical framework underpinning the research conducted and reported in this thesis.

4.7   Educational Implications and Limitations of Applying Emotional Intelligence to the Study of Patient-Provider Communication

The concept of EI emphasises the importance of emotions in assisting problem solving and has educational implications, in that EI is a set of skills which can be taught and learned (Lewis et al., 2005). The skills pertaining to EI that are most easily taught, quantified and directly related to PPC and patient and provider outcomes are cognitive and behavioural strategies to facilitate emotional awareness, management and understanding (Sattersfield and Hughes, 2007). Specifically with relation to the medical encounter, these include utilising providers' and patients' emotions in such a way as to maximise providers' interpersonal competences and subsequently minimise patient and provider stress.

A fairly recent systematic review evaluated the impact of emotion skills training programmes for medical students, in order to provide a starting point for the conceptualisation of emotion skills development across the continuum of doctors' professional development (Sattersfield and Hughes, 2007). Heterogeneity in study design, methodology and assessment made comparisons between the 22 included studies difficult; however the authors were able to conclude that emotion skills training modestly improved students' empathy and 'other-directed' emotion skills[18] for up to three years post-intervention. Year of study at medical school had no impact on emotion skills outcome, indicating that some other-directed emotion skills can be taught and retained by students irrespective of their stage of education (Sattersfield and Hughes, 2007). A more recent systematic review by the author (Cherry et al., 2012) evaluated the impact of structured educational interventions to improve EI in medical students. This review built on the work of Sattersfield and Hughes (2007) by evaluating the outcomes of studies at several levels using Kirkpatrick's model of hierarchal outcomes (Kirkpatrick, 1967). The review included 14 articles and again concluded the developmental aspect of EI, indicating that medical students' EI can be enhanced by learning and practicing the relevant skills and abilities, including the ability to perceive, appraise and express emotion,

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[18] Cognitive and behavioural skills intended to manage the emotions of others

the ability to access and generate emotions when required and the ability to regulate and understand emotions (Elam, 2000, Sattersfield and Hughes, 2007, Cherry et al., 2012).

Given EI's developmental pathway and likely links to PPC, the potential for development and modification of EI throughout undergraduate and postgraduate medical education is plentiful. Consideration of the influence of EI on PPC therefore may have a number of educational implications, given its developmental nature, and in this respect may be of more educational value than solely considering attachment theory.

5   Summary of Chapter

Chapter 1 highlighted the importance of investigating factors associated with individual differences in providers' PPC. The literature outlined in this chapter provided a theoretical rationale for hypothesising that medical students' and doctors' PPC may be influenced by their attachment styles and EI. Most research into the influence of providers' attachment styles on their PPC has been conducted in psychotherapy or mental health settings (Berry et al., 2008, Dozier et al., 1994). Such research concluded that securely attached care providers may be better able to respond appropriately to patients exhibiting emotional or psychosocial cues of distress than their insecurely attached counterparts (Dozier et al., 1994, Tan et al., 2005). Securely attached providers may be better able to respond to and explore patients' hints and cues to underlying health worries and be more likely to communicate in a flexible, problem-based, patient-centred way (Dozier et al., 1994). Attachment theory may therefore provide a theoretical framework for explaining differences in the likelihood of providers recognising and engaging appropriately with patients displaying emotion. Medical students' and doctors' attachment styles may therefore aid or impede their PPC depending on where they score on the two attachment dimensions (Salmon and Young, 2005).

Research into the role of EI in medicine is still in its infancy, but EI has particularly attracted interest as an attribute that fosters patient-doctor relationships (Lewis et al., 2005); it does so because high levels are positively associated with effective interpersonal skills and attributes such as empathy, compassion, sensitivity, impulse management and stress management, particularly when in stressful

environments (Fernandez, 2007). Whilst heterogeneity exists in researchers' conceptualisations of both EI and PPC, EI, specifically the ability to accurately identify the emotional responses of patients, may help doctors to identify cues of emotional distress and have a bearing on accuracy and quality of response to patients' cues. Medical students' and doctors' EI may therefore be positively related to their PPC.

Attachment style and EI are not independent of each other; rather, emotional management and regulation develop in childhood partly as a function of an individual's attachment style (Cassidy and Shaver, 2008). This relationship continues into adulthood, with secure attachment positively related to emotional regulation strategies that minimise stress and emphasise positive emotions (Mikulincer et al., 2001). When considering the role of attachment in medical education, it is therefore important to bear in mind the complex interplay between attachment and emotional management and regulation; literature suggests that securely attached individuals are better able to facilitate, manage and understand emotions than those insecurely attached (Kafetsios, 2004) irrespective of age or gender. Similar links between EI and both child and adult attachment have been found in other research papers (Gunning et al., 2011, Britton and Fuendeling, 2005, Campbell and Moore, 2003) and EI has been found to mediate the effects of attachment with regards to child bonding and dysfunctional rumination (Lanciano et al., 2012, Gunning et al., 2011). Attachment may therefore impact on PPC indirectly by influencing medical students' and doctors' EI, which in turn may influence their PPC.

This chapter therefore provided a theoretical basis for applying attachment theory and EI to the study of individual differences in PPC. The next chapter (Chapter 3) systematically examines the relevant published literature conducted in medical student and doctor samples to confirm the theoretical application of such theories to the study of medical students' and doctors' PPC. Gaps in the current literature base are identified and discussed as a prefix for the empirical research conducted within this thesis, and the chapter concludes Part 1 of the thesis by introducing the rationale for the empirical research conducted and reported in Part 2.

Chapter 3: Systematic Review of the Influence of Medical Students' and Doctors' Attachment Styles and Emotional Intelligence on their Patient-Provider Communication

1 Introduction

Chapter 1 highlighted the importance of investigating factors potentially influencing individual differences in providers' PPC. The literature outlined in Chapter 2 provided a theoretical rationale for hypothesising that medical students' and doctors' PPC may be influenced by their attachment styles and their EI. The purpose of this chapter is to systematically review and synthesise the published evidence regarding the relationships between medical students' and doctors' attachment styles and EI and their PPC in order to conclude an evidence-based rationale for the empirical research conducted and reported in Part 2 of this thesis. The methods by which literature relevant to this chapter's systematic review was identified and critically analysed are first presented, followed by synthesis and discussion of the relevant included studies. The limitations of the included research and the rationale for the thesis' empirical component are then presented as a prefix for Part 2.

2 Methods

The systematic review was guided by the general principles recommended by the Centre for Reviews and Dissemination (CRD) (2009) to ensure rigour and transparency. After several scoping searches, a comprehensive search strategy was employed to identify relevant literature. Medline, PsycINFO, CINAHL and Embase were searched for relevant published literature from their inception through to January 2013. As with the searches for Chapters 1 and 2, these databases were chosen to encompass several disciplines and to be as comprehensive as possible when considered together. Searches combined MeSH headings and free text words based on synonyms of a combination of relevant components: medical students or doctors, attachment styles, EI and PPC. Search strategies did not include methodological search filters[19] that would limit results to a specific study design nor

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[19] Terms that can be added to a search to increase its sensitivity or specificity, such as 'randomised controlled trial'

did they limit by year of publication. Details of the search strategies for each electronic database are provided in Sections 1.1 and 1.2 of Appendix 1.

A subsequent hand search of relevant journals was carried out, followed by a search of reference lists of all included full-text studies and a search of the author's own files. All identified references were exported to an EndNote® bibliographic database. Studies were assessed for inclusion in the review in two stages. All identified titles and abstracts were first scanned to identify citations with potential relevance, of which the full text of each was subsequently obtained. These were then assessed using the criteria shown in Table 4; any uncertainty was resolved by discussion with the author's supervisors. Non-English language papers, theoretical papers and papers with no relevance to the aim of the review were excluded.

Table 4

Systematic Review Inclusion Criteria

Inclusion criterion	Description
Population	Medical students/doctors and their patients (real/simulated)
Setting	Simulated or real healthcare setting
Predictor variable	Attachment styles and/or EI
Outcomes	Any one of the following outcomes: • PPC scores on standardised checklist/examination(s)/written exercise(s) • Patients' (real/simulated) ratings of PPC or associated outcomes, including but not limited to patient satisfaction, patient trust or perception of the patient-doctor relationship (PDR) • Frequency of patients' cues/concerns/clues to emotional distress • Identification of, or responses to, patients' cues/concerns/clues

2.1 Method of Critical Analysis and Appraisal

Relevant data from each included full-text paper were extracted; a random sample of 20% was checked by the author's supervisor (IF) to ensure that accurate and consistent data were recorded. Data obtained from each included study were critically analysed to determine whether they addressed the following review questions:

1. What are the relationships between medical students' and/or doctors' attachment styles and their PPC?

2. What are the relationships between medical students' and/or doctors' EI and their PPC?

3. What are the combined influences of medical students' and/or doctors' attachment styles and EI on their PPC?

Individual study data were summarised in structured tables and as a narrative description; data precluded a statistical synthesis due to heterogeneity in outcome measures of included studies. A discussion of study quality was included as a narrative within the discussion section due to diversity in study designs of included studies.

3 Results

3.1 Number of Studies Identified and Included

A total of 1597 non-duplicate records were identified by the search strategy and subsequently screened for inclusion in the review. Section 1.3 of Appendix 1 contains a flow diagram of study inclusion. Fourteen studies filled the inclusion criteria and were included (Salmon et al., 2008, Salmon et al., 2007, Atherton et al., 2009, Hick, 2009, Stratton et al., 2005, Austin et al., 2005, Austin et al., 2007, Wagner et al., 2002, Weng, 2008, Weng et al., 2008, Weng et al., 2011a, Weng et al., 2011b, Weng et al., 2011c, Fenton, 2008). Twelve were published in peer-reviewed journals (Salmon et al., 2008, Salmon et al., 2007, Atherton et al., 2009, Stratton et al., 2005, Austin et al., 2005, Austin et al., 2007, Wagner et al., 2002, Weng, 2008, Weng et al., 2008, Weng et al., 2011a, Weng et al., 2011b, Weng et al., 2011c); the remaining two were doctoral theses (Hick, 2009, Fenton, 2008). Data

were critically analysed to determine their contribution to the three review questions, which will now be discussed in turn.

3.2 Review Question 1: What are the Relationships between Medical Students' and/or Doctors' Attachment Styles and their Patient-Provider Communication?

Five studies (Salmon et al., 2008, Salmon et al., 2007, Atherton et al., 2009, Fenton, 2008, Hick, 2009) evaluated the influence of medical students' (Atherton et al., 2009, Hick, 2009) or doctors' (Salmon et al., 2008, Salmon et al., 2007, Fenton, 2008) attachment styles on their PPC. All studies involved participants of both genders, with four having slightly higher proportion of males (56.00-58.33%) (Salmon et al., 2008, Salmon et al., 2007, Atherton et al., 2009, Fenton, 2008) and one having proportionately fewer (35.50%) (Hick, 2009). Of the two papers which reported participants' ages (Atherton et al., 2009, Hick, 2009), ages ranged from 17 to 36. Only one study reported participants' ethnicities, with the majority of participants (68.64%) categorised as being 'White' (Hick, 2009).

All studies measured attachment using the Relationship Questionnaire (RQ)[20] (Bartholomew and Horowitz, 1991). All studies quantified communication using coding schemes, with three studies using the Verona Coding Definition of Emotional Sequences[21] (VR-CoDES, Del Piccolo et al., 2009) (Hick, 2009, Atherton et al., 2009, Fenton, 2008) and the remainder using the Liverpool Clinical Interaction Analysis Scheme[22] (LCIAS, Ring et al., 2005) (Salmon et al., 2007, Salmon et al., 2008). One study also considered students' PPC OSCE scores, rated using the Liverpool Communication Skills Assessment Scale[23] (LCSAS, Humphris and Kaney, 2001) (Hick, 2009). Table 5, on page 62, presents a summary of the individual studies' characteristics.

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[20] The Relationship Questionnaire is a measure in which participants rate their degree of agreement with four short paragraphs, each describing an attachment style, on a 7-point Likert scale. Participants can be categorised into an attachment category or their responses can be scored categorically.

[21] A method of analysing providers' responses to patients' cues; cf Section 3.7.2 of Chapter 5

[22] A coding scheme developed to analyse primary care consultations about medically unexplained symptoms

[23] A checklist to assess medical students' PPC in an OSCE, comprising a composite of examiners' and simulated patients' ratings

Table 5

Characteristics of Included Studies (Attachment Theory)

Study name	Location	Aim	Participant group	*n*	Gender (male), % (n)	Age (years)	'White' ethnicity, % (n)	Attachment measure	Attachment scores, % (n)*
Atherton et al (2009)	UK	To examine the relationship between attachment styles and medical students' responses to simulated patients' cues	First-year medical students	82	57.32 (47)	*M* 20.0 Range 17-34	NR	RQ	Securely attached: 48.8%
Fenton (2008)	UK	To examine the relationship between attachment styles and GPs' responses to patients' cues	GPs from 11 sites	24	58.33 (14)		NR	NR	RQ	Securely attached: 31.4%

Table 5 Continued

Study name	Location	Aim	Participant group	*n*	Gender (male), % (n)	Age (years)	'White' ethnicity, % (n)	Attachment measure	Attachment scores, % (n)*
Hick (2009)	UK	To examine the relationship between attachment styles and medical students' responses to simulated patients' cues	Fourth-year medical students	169	35.50 (60)	*M* 22.5 (*SD* 2.7)	68.64 (116)	RQ	Securely attached: 51.3%
Salmon et al (2007)	UK	To examine the relationship between attachment styles and GPs' responses to MUS patients	GPs from 11 sites	24	58.33 (14)	NR	NR	RQ	Anxiety: *M* 3.0 (*SD* 3.3) Avoidance: *M* 0.9 (*SD* 3.9)

Table 5 Continued

Study name	Location	Aim	Participant group	*n*	Gender (male), % (n)	Age (years)	'White' ethnicity, % (n)	Attachment measure	Attachment scores, % (n)*
Salmon et al (2008)	UK	To examine the relationship between attachment styles and GPs' proposals of somatic interventions to MUS patients	GPs from 11 sites	25	56.00 (14)	NR	NR	RQ	Anxiety: *M* 3.2 (median 3) Avoidance: *M* 0.9 (median 1)

Note: GP = General Practitioner, MUS = medically unexplained symptoms, RQ = Relationship Questionnaire; *M* = mean, *SD* = standard deviation, NR = not reported, * = unless otherwise stated

Table 6

Main Findings (Attachment Theory)

Study name	Outcome measure(s)	Main findings
Atherton et al (2009)	Response to simulated patients' cues (early version of the VR-CoDES)	No significant relationships found between students' attachment styles and responses to simulated patients' cues
Fenton (2008)	Frequency of and response to patients' cues of emotion (VR-CoDES)	No significant relationships found between GPs' attachment styles and responses to patients' cues
		No significant differences in the number of cues presented to securely attached or. insecurely attached GPs
Hick (2009)	Frequency of and response to simulated patients' cues of emotion (VR-CoDES)	No significant relationships found between students' attachment styles and proportion of responses to simulated patients' cues that provided space for further disclosure of emotion
	Examiner rating of PPC in an OSCE (LCSAS)	Students with low attachment avoidance and/or anxiety elicited fewer cues of emotion per interaction than those high on attachment avoidance and/or anxiety
		Students with low attachment avoidance and/or anxiety had significantly higher LCSAS scores than those with high attachment avoidance and/or anxiety

Table 6 Continued

Study name	Outcome measure(s)	Main findings
Salmon et al (2007)	Frequency of criticism to patients seeking emotional support (LCIAS)	Attachment anxiety significantly negatively related to frequency of GPs' criticisms towards patients
		No relationships between attachment avoidance and frequency of criticisms
Salmon et al (2008)	Proposition of somatic intervention (LCIAS)	Attachment anxiety significantly positively associated with frequency of GPs' proposition of somatic intervention to patient
		Attachment avoidance significantly negatively associated with frequency of GPs' proposition of somatic intervention to patients

Note: GP = General Practitioner, MUS = medically unexplained symptoms, LCIAS = Liverpool Clinical Interaction Analysis Scheme, VR-CoDES = Verona Coding Definition of Emotional Sequences, OSCE = Objective Structured Clinical Examination.

3.2.1 Main Findings (Review Question 1)

Table 6, on page 65, shows each study's main findings. Results will now be discussed by outcome measure.

3.2.1.1 Medical Students' Communication Skills' Performance in Examinations

One study (Hick, 2009) considered the relationship between attachment styles and medical students' performance in an OSCE, assessed using the LCSAS, applied to three 10-miunute OSCE stations. Attachment avoidance was significantly negatively related to LCSAS scores. Both attachment avoidance and attachment anxiety significantly predicted mean LCSAS scores, together accounting for 8% of the variance. These data indicate that attachment influences medical students' PPC in an examination setting.

3.2.1.2 Medical Students' and Doctors' Responses to Patients' Cues

Two studies directly examined the relationship between medical students' attachment styles and their PPC skills with simulated patients (Atherton et al., 2009, Hick, 2009). Both took place in simulated settings and both used the VR-CoDES (Del Piccolo et al., 2009) to micro-analyse consultations. Neither found a relationship between students' attachment styles and their responses to simulated patients' cues, specifically the proportion of students' responses 'providing space' for simulated patients to further discuss emotion. However, students with high attachment avoidance and/or high attachment anxiety were significantly more likely to elicit simulated patients' cues of emotional distress during consultations than their counterparts (Hick, 2009).

Two of the three studies that investigated the relationships between attachment styles and GPs' responses to patients presenting with MUS reported positive associations between attachment styles and PPC (Salmon et al., 2008, Salmon et al., 2007). Salmon and colleagues (2007) found that GPs' attachment anxiety was significantly positively related to the frequency of criticisms towards patients with MUS; no relationships were observed with attachment avoidance. A subsequent study designed to extend these findings confirmed significant positive associations between GPs' attachment anxiety and frequencies of proposition of somatic interventions following patients' expressions of psychosocial distress

(Salmon et al., 2008). However, Fenton (2008) found no relationship between GPs' attachment styles and either the number of patients' cues presented to the GP, or GPs' responses to cues, specifically the proportions of responses that 'provided space' for further discussion of emotion; differences in coding schemes used between the two Salmon studies (2007, 2008) and the Fenton study (2008) may account for the lack of consistency between the findings. These data indicate that medical students' and doctors' attachment styles may influence how they respond to patients showing emotional distress.

3.3 Review Question 2: What are the Relationships between Medical Students' and/or Doctors' Emotional Intelligence and their Patient-Provider Communication?

Nine studies (Stratton et al., 2005, Austin et al., 2005, Austin et al., 2007, Wagner et al., 2002, Weng, 2008, Weng et al., 2008, Weng et al., 2011a, Weng et al., 2011b, Weng et al., 2011c) evaluated the impact of medical students' (Stratton et al., 2005, Austin et al., 2005, Austin et al., 2007) or doctors' (Wagner et al., 2002, Weng, 2008, Weng et al., 2008, Weng et al., 2011a, Weng et al., 2011b, Weng et al., 2011c) EI on their PPC or related outcomes. Five studies reported disproportionately high numbers of male participants (85.45-96.00%) (Weng, 2008, Weng et al., 2008, Weng et al., 2011a, Weng et al., 2011b, Weng et al., 2011c) and two reported proportionately fewer (31.13-32.69%) (Austin et al., 2005, Austin et al., 2007). One paper reported an equal gender split (Stratton et al., 2005). Of the seven papers which discussed participants' ages (Austin et al., 2005, Wagner et al., 2002, Weng, 2008, Weng et al., 2008, Weng et al., 2011a, Weng et al., 2011b, Weng et al., 2011c), mean age ranged from 18.60 to 43.10. No study provided data regarding participants' ethnicities.

Two studies measured EI using Austin's Emotional Intelligence Scale[24] (Austin et al., 2005, Austin et al., 2007), one each using the Trait Meta-Mood Scale[25] (TMMS) (Stratton et al., 2005) and the Bar-On EQ-i (Wagner et al., 2002) and the remaining five using the Wong and Law Emotional Intelligence Scale[26] (WLEIS) (Weng, 2008, Weng et al., 2008, Weng et al., 2011a, Weng et al., 2011b, Weng et

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[24] A 41-item self-report measure of trait EI
[25] A 30-item self-report measure of *perceived* trait EI
[26] A 16-item self-report measure of trait EI

al., 2011c). Three studies used academic performance as an outcome measure (Austin et al., 2005, Austin et al., 2007, Stratton et al., 2005) and six considered patient satisfaction or patient trust (Weng, 2008, Weng et al., 2008, Weng et al., 2011a, Weng et al., 2011b, Weng et al., 2011c, Wagner et al., 2002). Table 7, on page 70, presents a summary of individual studies' characteristics.

3.3.1 Main Findings (Review Question 2)

Table 8, on page 74, shows each study's main findings. Results will now be discussed by outcome measure chosen.

Table 7

Characteristics of Included Studies (Emotional Intelligence)

Study name	Location	Aim	Participant group	*n*	Gender (male), % (n)	Age (years)	Means of assessing EI	EI scores, % (SD)*
Austin et al (2005)	UK	To assess relationships between EI, empathy and examination performance	First-year medical students	156	32.69 (51)	M 18.60 (SD 1.60) Range 17-28	Austin's Emotional Intelligence Scale	Beginning of Year 1: 154.5 (13.2) End of Year 1: 154.4 (14.3)
Austin et al (2007)	UK	To assess relationships between EI, empathy and examination performance	First-, second- and fifth-year medical students	273	31.13 (85)	NR	Austin's Emotional Intelligence Scale	Whole sample (males): 150.3 (13.8) Whole sample (females): 155.6 (11.9)

Table 7 Continued

Study name	Location	Aim	Participant group	*n*	Gender (male), % (n)	Age (years)	Means of assessing EI	EI scores, % (SD)*
Stratton et al (2005)	USA	To examine relationships between EI and clinical skills performance in an examination	Third-year medical students	166	55.42 (92)	NR	TMMS	Attention to feelings subscale (males): 49.4 (8.0); Attention to feelings subscale (females): 51.1 (8.0) Clarity of feelings subscale (males): 26.9 (6.1); Clarity of feelings subscale (females): 23.4 (6.1) Mood repair subscale (males): 40.3 (4.2); Mood repair subscale (females): 41.0 (4.2)

Table 7 Continued

Study name	Location	Aim	Participant group	*n*	Gender (male), % (n)	Age (years)	Means of assessing EI	EI scores, % (SD)*
Wagner et al (2002)	USA	To explore relationships between doctors' EI and patient satisfaction	Doctors (academic family medicine)	30	60.00 (18)	M 37.80 Range 26.90-52.50	Bar-On EQi	Total EI: 97.6 (NR)
Weng (2008)	Taiwan	To assess the contribution of doctors' EI to patient trust	Doctors (11 specialties)	39	89.74 (35)	M 42.00 (SD 7.40)	WLEIS (rated by nurses observing doctors)	Nurse-rated: 5.26 (1.21) Subscales: NR
Weng et al (2008)	Taiwan	To explore relationships between doctors' EI and the PDR	Doctors (11 specialties)	39	89.74 (35)	M 42.00 (SD 7.40)	WLEIS (self-rated and rated by nurses observing doctors)	Doctor-rated: 5.67 (.68) Nurse-rated: 5.26 (1.21) Subscales: NR

Table 7 Continued

Study name	Location	Aim	Participant group	*n*	Gender (male), % (n)	Age (years)	Means of assessing EI	EI scores, % (SD)*
Weng et al (2011a)	Taiwan	To assess relationships between nurse-rated doctors' EI, healthcare climate and patient trust	Doctors (surgeons and internists)	211	91.47 (193)	M 41.8 (SD 7.3)	WLEIS	NR
Weng et al (2011b)	Taiwan	To investigate relationships between doctors' EI, burnout, job satisfaction and patient satisfaction	Doctors (internists)	110	85.45 (94)	M 40.8 (SD 6.9)	WLEIS	Total: NR SEA: 5.94 (.81) OEA: 5.10 (.92) UOE: 5.44 (.80) ROE: 5.22 (.97)
Weng et al (2011c)	Taiwan	To assess the relationships between doctors' EI, empathy, patients' health perceptions and patient satisfaction pre- and post-surgery	Doctors (surgeons)	50	96.00 (48)	M 43.1 (*SD* 8.6)	WLEIS	NR

Note: WLEIS = Wong and Law Emotional Intelligence Scale, Bar-On EQi = Bar-On Emotional Quotient Inventory, TMMS = Trait Meta Mood Scale, PDRQ-9 = Patient Doctor Relationship Questionnaire, PDR = patient-doctor relationship, CTX = comprehensive performance examination; M = mean, SD = standard deviation, NR = not reported; SEA = Self-emotion appraisal, OEA = other-emotion appraisal, UOE = use of emotion, REA= regulation of emotion, * = unless otherwise stated.

Table 8

Main Findings (Emotional Intelligence)

Study name	Relevant outcome measure(s)	Main findings
Austin et al (2005)	Positive feelings about PPC skills' exercise (measured using 14-item attitudes scale)	EI positively correlated with self-reported feelings about a PPC skills' exercise
	Examination performance	EI significantly positively associated with examination performance at the start of Year 1 but not subsequent examination performance at the end of Year 1
Austin et al (2007)	14-item scale measuring positive feelings about PPC (first-year students only)	First-year students' EI positively correlated with self-reported feelings about PPC exercise
	Examination performance	Second-year students' EI significantly correlated with peer ratings' of PBL contributions
		No significant relationships between students' EI and examination performance
Stratton et al (2005)	Performance (including PPC) in CTX	'Attention to feelings' subscale of TMMS significantly positively correlated with PPC; association did not remain significant when regression analyses were conducted

Table 8 Continued

Study name	Relevant outcome measure(s)	Main findings
Wagner et al (2002)	11-item patient satisfaction questionnaire based on 1994 Commonwealth Fund's Minority Health Survey	No significant associations between doctors' EI and patients' ratings of satisfaction
		Higher EI scores on 10 of 15 subscales when patient satisfaction dichotomised into '100% satisfaction' doctors and those with less than 100% satisfaction and EI scores compared. Only the happiness subscale statistically significant
Weng (2008)	11-item trust in doctor questionnaire PDRQ-9	Significant positive relationships observed between three dimensions of nurse-rated doctors' EI and patients' ratings of trust (other emotional appraisal, understanding of emotion and regulation of emotion)
		No significant relationship between nurse-rated doctors' EI and the PDR
Weng et al (2008)	2-item doctor satisfaction questionnaire	No relationship between doctors' self-rated EI and the PDR
	2-item hospital satisfaction questionnaire PDRQ-9 (patient- and nurse-rated) Nurse ratings of patients' trust in doctor	Nurse ratings of the regulation of emotion subscale of doctors' EI significantly positively correlated with the PDR

Table 8 Continued

Study name	Relevant outcome measure(s)	Main findings
Weng et al (2011a)	11-item trust in doctor questionnaire	Significant positive association between doctors' EI and patient trust after controlling for doctors' age, sex and education
Weng et al (2011b)	2-item patient satisfaction questionnaire	No significant relationships observed between doctors' EI and patient satisfaction
Weng et al (2011c)	PDRQ-9	Significant positive association between doctor EI and patients' perceptions of the PDR
	2-item patient satisfaction questionnaire	Significant positive association between doctor EI and patient satisfaction

Note: PBL = problem-based learning, TMMS = Trait-Meta-Mood Scale, PDR = patient-doctor relationship, CTX = comprehensive performance examination, PDRQ-9 = patient-doctor relationship questionnaire.

3.3.1.1 Medical Students' Academic Performance

Three studies investigated the relationship between medical students' EI and their PPC (Austin et al., 2005, Austin et al., 2007, Stratton et al., 2005). In two studies, significant positive relationships were observed between first-year medical students' EI, measured using a scale devised by the authors, and their self-reported feelings about a PPC exercise; these significant relationships were not observed when students' performances in end-of-year PPC examinations were considered (Austin et al., 2005, Austin et al., 2007). The remaining study measured EI using the TMMS; positive associations were reported between medical students' PPC and a subscale of their EI (attention to feelings). However a regression model did not find this to significantly predict students' PPC (Stratton et al., 2005). This subscale was also negatively correlated with physical examination performance, indicating that students with higher EI may spend more time taking a history from patients and consequently neglecting the physical examination than those with lower EI (Stratton et al., 2005). These studies provide tentative support for a relationship between medical students' EI and their PPC; however heterogeneity in measures of assessing both EI and PPC makes it difficult to draw firm conclusions.

3.3.1.2 Patient Satisfaction with Doctors' Patient-Provider Communication

Three studies investigated the relationship between doctors' self-rated EI and patient satisfaction (Wagner et al., 2002, Weng et al., 2011c, Weng et al., 2011b). Positive relationships were reported in only one of the three studies (Weng et al., 2011c). However, analysis of doctors with 100% patient satisfaction scores found that the 'happiness' subscale of the EQi related significantly to patient satisfaction (Wagner et al., 2002), indicating possible links between doctors' general moods and their patients' satisfaction with their care. However, this analysis was a post-hoc attempt to maximise the available range of scores by collapsing data into two groups and therefore these findings should be interpreted with caution. The remaining studies found no relationship between doctors' EI and patient satisfaction, although it is worth noting that despite the number of patients surveyed, use of a two-item measure to assess patient satisfaction may have reduced the sensitivity of the analyses. These data suggest limited to no relationships between doctors' EI and their patients' satisfaction.

3.3.1.3 Patients' Perceptions of the Patient-Doctor Relationship

Three studies investigated the relationship between doctors' self-rated EI and patients' perceptions of the PDR (Weng, 2008, Weng et al., 2008, Weng et al., 2011a); positive relationships were observed in only one study (Weng et al., 2011c), with the remainder concluding no relationship between the variables. When nurse-ratings of doctors' EI were considered, one study reported significant positive associations between one subscale of nurse-rated doctors' EI and the PDR (Weng et al., 2008); the other found no relationships (Weng, 2008). These data provide tentative, albeit mixed, support for a relationship between doctors' EI and patients' perceptions of the care relationship.

3.3.1.4 Patient Trust in the Doctor

Two studies investigated the relationship between doctors' self-rated EI and patient trust; both found positive relationships between the variables (Weng, 2008, Weng et al., 2011a), with one further reporting significant positive associations after controlling for doctors' age, sex and education (Weng et al., 2011a). These data indicate that doctors' EI positively influences patients' trust in doctors, which may form an important component of PPC.

3.4 Review Question 3: What are the Combined Influences of Medical Students' and/or Doctors' Attachment Styles and Emotional Intelligence and their Patient-Provider Communication?

No studies reported empirical findings relating to review question 3.

4 Discussion

4.1 Review Question 1: What are the Relationships between Medical Students' or Doctors' Attachment Styles and their Patient-Provider Communication?

Five studies were included in this review that investigated the relationship between medical students' or doctors' attachment styles and their PPC or related outcomes (Salmon et al., 2008, Salmon et al., 2007, Atherton et al., 2009, Fenton, 2008, Hick, 2009). This is a surprisingly low number given recent research interest in the application of attachment theory to the study of PPC (Peters et al., 2011, Salmon and Young, 2009, Adshead, 2010). Narrative synthesis of the included studies indicated a limited degree of support for relationships between medical

students' and doctors' attachment styles and frequency of behaviours facilitating disclosure of and discussion of patients'/simulated patients' emotions. Furthermore, data indicated support for attachment styles influencing medical students' performances in PPC OSCEs.

Whilst more research is needed to assess the influence of medical students' attachment styles on their PPC, findings from clinical settings indicate that doctors' attachment styles may impact on their abilities to respond to and explore patient cues of emotional distress; for example, highly anxious doctors may be aware of their discomfort with providing psychological counselling and therefore respond by providing somatic interventions out of respect for the patient and value for the patient-provider relationship, rather than as an attempt to put distance between themselves and the patient (Salmon et al., 2007). Studies conducted in a non-medical sample (Bartholomew and Horowitz, 1991, Dozier et al., 1994, Berry et al., 2008) indicate that securely attached providers may demonstrate a more intensive and less evasive interaction style when engaging in PPC than those insecurely attached (see Chapter 2); no data were available to support or refute these findings in a medical student or doctor population.

It is important when making inferences from studies that their methodological quality is considered. Overall, inconsistencies were evident in methodological reporting and quality in the studies addressing review question 1. The main bias associated with studies addressing review question 1 is that they were all conducted by largely the same research group, within one region of the UK. It is therefore important for the reader to bear in mind the emergent similarities and overlap in the populations selected, outcome measures and attachment indexes; indeed, it raises the issue as to whether the findings of such studies can be treated as discrete. Whilst the consistency in findings suggest that providers' attachment styles do indeed influence their PPC, clearly more research using different populations, outcome measures and measures of attachment is required.

Furthermore, none of the included studies utilised a measure of attachment specifically designed to only be scored dimensionally; all used the RQ, a measure designed and validated for scoring attachment styles both categorically and dimensionally. Consideration of attachment as a categorical construct assumes that differences between individuals in one category are redundant (Daniel, 2006) and

that categories are mutually exclusive (Collins and Read, 1990). It may therefore be unsurprising that no associations were found between medical students' 'categorical' attachment styles and their responses to simulated patients' cues of emotion (Atherton et al., 2009); researchers advocate that dimensional scoring of adult attachment provides greater information for research purposes, is more psychometrically robust (Shaver and Mikulincer, 2002), and increases statistical power and measurememt precision when compared to categorical scoring (Fraley et al., 2000). Indeed, Atherton and colleagues (2009) themselves recommend that future research should be carried out to investigate the relationships between dimensional scores of attachment and PPC.

Variation in participant numbers in the included studies must also be highlighted. Participant numbers ranged from 25 to 169, thus introducing issues around representative sampling, statistical power and self-selection bias. Self-selection bias is inherent and expected in such research, yet it is important to stress that self-selecting participants may differ in their attachment styles than participants chosen randomly to participate. This may lead to a polarisation of responses, thus jeopardising the generalisability of findings, particularly in studies with fewer participant numbers (for example, Salmon et al., 2007, Salmon et al., 2008). Equally of note is that no research considered changing relationships between attachment and PPC over time. Whereas there may be minimal changes in providers' attachment styles longitudinally (Ainsworth, 1989, Maunder and Hunter, 2008), its influence on PPC in a sample may alter as a function of students' or doctors' training or experience. It is therefore pertinent that calls for longitudinal research also be emphasised when considering the application of attachment theory to PPC. Consideration of a large sample pool with multiple sampling points may increase the opportunities to participate and reduce the risk of polarisation of responses, as outlined above.

In conclusion, the data from the included studies relating to review question 1 provide some degree of support for there being relationships between medical students' and doctors' attachment styles and their PPC. However, the data suggest the need for further application and investigation of the relationships between attachment styles and PPC in both a medical student and doctor population, outside that of the current UK population, outcome measures and attachment indexes currently published. This need for further investigation is supported by the results of

a recent conceptual review by Salmon and Young (2009) which further highlighted that attachment theory may be an appropriate theoretical framework to explore individual differences in PPC.

4.2   Review Question 2: What are the Relationships between Medical Students' or Doctors' Emotional Intelligence and their Patient-Provider Communication?

Nine studies investigated the relationship between medical students' or doctors' EI and their PPC, or related outcomes. As with the attachment style literature, disparity in reporting styles and outcomes was evident. Encouragingly, all studies considered either directly observed PPC or patient-level factors such as patient satisfaction or patient trust as outcomes. Only two studies considered 'proxy' measures of PPC, such as attitudes towards PPC, and both subsequently related EI to academic PPC performance (Austin et al., 2005, Austin et al., 2007). The included studies provided mixed data relating to review question 2.

No study investigated the association between EI and medical students' or doctors' abilities to identify or respond to patients' cues of emotion, thus making it impossible to draw conclusions relating to the influence of EI on these abilities. However, data were available relating to the influence of EI on subjective measures of PPC, such as examination scores or patient-level outcomes such as patient satisfaction or patient trust in their doctor. Heterogeneity in methods chosen to measure both EI and PPC made it difficult to draw conclusions regarding relationships; rather than providing conclusive findings, the results suggest the need for further exploratory research into the influence of providers' EI on their PPC.

The remaining research focused on patient-level outcomes, such as patient satisfaction or patient trust in their doctor, and used doctors of varying specialties as participants. Theory provides a basis for applying EI to the study of PPC (cf Chapter 2), yet the results of the above research indicate little to no relationship between doctors' self-reported EI and patient level outcomes such as patient satisfaction (Weng et al., 2011c). This is a surprising finding given the growth in review pieces and editorials advocating the importance of EI for developing the patient-doctor relationship and in emotive responding to patient' cues of emotional distress (Grewal and Davidson, 2008). A conceptual review by Hinkel-Young and Watson (2010) highlights the need for more research using the doctor as the unit of analysis to

measure patient satisfaction and to reduce the risk of single-source biases in current research. It is therefore possible that the lack of conclusive findings may be in part attributed to study designs rather than there being no relationships between doctors' EI and patient-level outcomes.

As with the attachment literature, the findings of studies providing data addressing review question 2 must be interpreted with caution, particularly considering that PPC varied in its definition and measurement between studies. Of the studies investigating PPC as an observed outcome (rather than patient-level outcomes), no study evaluated the impact of students' EI on empathic PPC, specifically medical students' or doctors' abilities to recognise, acknowledge and respond to cues of emotional distress from patients or simulated patients. This is surprising given that during consultations, doctors have to be able to make judgments about *when* to be explicitly emotional and must also understand how patients or their relatives will perceive their emotional and instrumental actions in the context of the relationships that characterise clinical care. Conclusions from studies investigating patients' ratings of doctors' PPC must also be drawn with caution due to the limited range of response options and ceiling effect associated with the chosen measures of assessing the PDR, doctor trust and patient satisfaction. The potential lack of external generalisation of the findings to other settings and samples may be in part attributed to the contextual effects of setting on the patient-doctor relationship and the potential Hawthorne effect of doctors knowing that patients would be surveyed post-consultation.

In addition, the majority of studies based assessment of EI on heterogeneous self-report questionnaires, which may not be adequately measuring the emotional competencies underpinning some models of EI. Self-report trait measures of EI such as the WLEIS (a measure used in six of the eleven included studies) strongly overlap with empathy and well-established personality traits such as extroversion (Davies and Stankov, 1998). It is therefore important to bear in mind that the findings and generalisability of the studies included in this review may differ as a function of their choice of measurement tool and conceptualisation of EI. Mayer and colleagues' four-branch ability model of EI has been shown to be independent from transient health states and personality traits (Brannick et al., 2011, Lopes et al., 2003, Brackett and Salovey, 2006, Mayer et al., 2003). It fills the criteria to be conceptualised as an 'intelligence' rather than a collection of personality traits or a preferred way of

behaving (Mayer et al., 1999) and therefore may form a conceptually clearer basis for research into the role of EI in medicine. With this in mind, it is surprising that no studies used the MSCEIT to measure EI.

It must finally be noted that the majority of studies (Weng, 2008, Weng et al., 2008, Weng et al., 2011a, Weng et al., 2011b, Weng et al., 2011c) were conducted by the same research group at the I-Shou University, again, as with the attachment literature, raising issues of bias. When coupled with the diversity/inconsistency in the concepts used and applied in the included studies, the data clearly illustrate the need for more standardised and homogenous research to be conducted in the area.

4.3   Review Question 3: What are the Combined Influences of Medical Students' or Doctors' Attachment Styles and Emotional Intelligence and their Patient-Provider Communication?

No studies were identified which reported empirical findings relating to review question 3, thus it was not possible to draw conclusions regarding review question 3. Clearly more research is needed to address the interplay between providers' attachment styles and EI and their association with PPC, particularly given the empirical and theoretical literature outlined in Chapter 2, and the findings of the current review.

5   Conclusions and Summary of Rationale for the Thesis

Chapter 1 highlighted the importance of investigating factors associated with individual differences in providers' PPC. The literature outlined in Chapter 2 provided a theoretical rationale for hypothesising that medical students' or doctors' PPC with patients may be influenced by their attachment styles and EI. The systematic review reported in this chapter provided an overview of the current state of this research literature.

This review can conclude that data regarding the relationship between medical students' or doctors' attachment styles and EI and their PPC are limited. However, the review's findings support tentative and indirect links between the concepts. Methodological limitations of the included studies make conclusive recommendations for research or practice difficult. However, the findings of this review lend support for the value of applying attachment theory and EI to the study

of individual differences in medical students' and doctors' PPC, and suggest the need for more research to be conducted in the area.

Whilst considering the application of attachment theory and EI to PPC, it is important to bear in mind that an individual's EI develops partly as a function of their attachment (cf Chapter 2), and therefore the constructs are not independent of each other. The results of this systematic review confirm that, to date, no study has considered the interplay between medical students' and doctors' attachment styles, EI and PPC, specifically their abilities to identify and respond to patients showing emotional distress. Whilst the review provides some support for attachment and EI influencing PPC, there therefore is a clear need for consideration of the influence of both theories *together*, rather than treating each as separate influencers.

The research conducted within this thesis has been designed and conducted to address this gap in the literature and the limitations of current research outlined above. The next section of the thesis (Part 2) contains three chapters detailing the research strategy and empirical findings of the thesis, and will now be presented.

Part 2: Research Strategy and Empirical Findings

Introduction

Part 1 comprised three chapters and located the field of enquiry by discussing published empirical and theoretical literature. It is clear, having located the field of enquiry, that there is a need for research to address the following research question: What influences do medical students' and doctors' attachment styles and EI have on their PPC - and, more specifically, their PPC with patients showing signs of emotional distress?

Part 2 presents the thesis' empirical component, which addresses this research question. When designing this empirical component, consideration was paid to four main questions:

1. Which participant group(s) should be studied?
2. In which setting(s) should PPC be studied?
3. How should attachment styles and EI be measured?
4. How should PPC be quantified?

These questions will now be discussed in turn to provide the reader with the rationale behind the design and conduct of the empirical studies discussed in Part 2.

Which Participant Group(s) Should Be Studied?

To address the first question, a number of possible approaches were considered. Previous research (Hick, 2009, Atherton et al., 2009, Wagner et al., 2002, Weng, 2008, Weng et al., 2008, Weng et al., 2011a, Weng et al., 2011b, Weng et al., 2011c) designed to explore the relationships between attachment styles or EI and PPC has focused only on one participant group at a time, thus limiting the generalisability of the findings. The decision was therefore made, therefore, to conduct a number of smaller studies to explore the main research question. From consulting the literature, two participant groups were chosen. Early-year medical students (Years 1 and 2 of undergraduate medical education) participated in Studies 1 and 2 respectively, and practicing junior doctors (doctors in their second Foundation year) participated in Study 3. Both medical students and doctors were chosen as participants in order for the findings to potentially have both *educational* and *clinical* implications.

Early-year medical students were chosen for a number of reasons. First, whilst PPC skills are taught, developed and assessed in medical students throughout their undergraduate training (General Medical Council, 2009b), medical students' skill development in terms of dealing with the emotional aspects of PPC is not necessarily linear (Humphris and Kaney, 2001, Pfeiffer et al., 1998). Indeed, students, particularly those in their early years of medical education, report difficulties in responding to patients presenting in a manner that is incongruent with a medical framework (Peters et al., 2011). For example, Smith and colleagues (1984) found that whilst 87% of early-year medical students avoided discussion of patients' psychosocial issues and/or exhibited excessive control during consultations, most were unaware of these communication strategies; they were only brought to light during training. Whilst this study was conducted some years ago, the finding that early-year medical students feel less well-equipped with the skills required to recognise and respond to simulated patients' psychosocial and contextual cues than those required to explore patients' biomedical cues, even after training, is still well-reported to the present day (Thompson et al., 2010). It was therefore considered pertinent to first consider how PPC, specifically the communication of emotive or psychosocial issues, is learned and applied by medical students in the early years of undergraduate medical education in order to provide data and draw conclusions upon which to build subsequent research. Identification of influencing factors towards PPC in early-year students was thought to have *educational* implications.

Junior doctors were also chosen as participants for a number of reasons. First, as they were only two years post-graduation, the influence of their undergraduate medical education, and therefore their PPC skills' teaching, should still be strong. Indeed, the two-year period immediately post-graduation has been argued to be the point in doctors' careers during which the influence of their undergraduate medical education is strongest (Watmough, 2008). However, as junior doctors have joined the medical register, they have experience of the responsibilities associated with practising as a doctor and the challenges associated with balancing the different functions of a consultation (Silverman et al., 2005). Also, from experiencing differing rotations and types of patients, their PPC should have further been developed and may manifest differently in each doctor dependent on their attachment style or EI.

Second, junior doctors must complete the two-year postgraduate Foundation Programme prior to further continuation in a medical specialty. Identification of the influences of doctors' attachment styles and/or EI was therefore thought to have *educational* implications for postgraduate teaching and training, both within the Foundation Programme and afterwards. Targeted education aimed at improving junior doctors' PPC skills by educating them about the influence of their attachment styles (and EI) on their PPC may assist 'doctors in difficulty'[27] to improve their PPC skills and progress through the Foundation Programme into specialty training. Such education may also result in increasing numbers of junior doctors entering General Practice, given that attachment style is related to perceived and actual likelihoods of entering into careers in General Practice (Ciechanowski et al., 2004, Ciechanowski et al., 2006). Given these potential educational implications, this group was therefore chosen as participants for a final, pilot study to further the findings of the first two studies; time and resource constraints did not allow for a full study to be conducted.

In Which Setting(s) Should Patient-Provider Communication Be Studied?

The second decision to be made was the setting(s) in which to study PPC. Medical students are objectively examined on their PPC skills annually using OSCEs (see Chapter 1), and this assessment, in part, determines their progression to the next academic year. This OSCE assessment provides all students with the same opportunities to demonstrate PPC and therefore was considered to be the most appropriate setting in which to study medical student samples' PPC (Studies 1 and 2).

The junior doctor sample (Study 3) rotated through three, four-month, clinical placements in their second Foundation year, and therefore there was a greater choice of potential study settings than for Studies 1 and 2. After careful consideration, General Practice was chosen as the most appropriate setting for the study of PPC for Study 3. Consultations in General Practice were chosen for their similarity in setting and duration to that of the first- and second-year PPC OSCEs, as they take the form of patient-doctor interactions which must be completed in a finite time period and which require exploration of the patient's presenting complaint(s). In addition, with the exception of medical emergencies, General Practice is generally an

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[27] 'Doctors in difficulty' are junior doctors who require extra time and/or training to ensure that they meet the requirements of their chosen specialty curriculum. British Medical Association (2013).

individual's first point of contact with services upon experiencing emotional or psychosocial distress (Arborelius and Österberg, 1995), and forms the main referral pathway into adult psychological services (National Institute of Health and Clinical Excellence, 2013). It is estimated that between 25% and 46% of patients in General Practice present with psychological distress and/or psychological disorders (Kessler et al., 1987, Pini et al., 1997), yet evidence suggests that a large proportion of these symptoms go unnoticed by a proportion of GPs (Verhaak et al., 2006). This is particularly likely if psychosocial symptoms are presented during the patient's initial consultation with the doctor (Kessler et al., 2002) or if patients' initial presenting complaints are physical in nature (Coyne et al., 1995, Olfson et al., 1995). It is therefore particularly important that doctors working within General Practice are able to correctly identify and respond to patients' cues in order to aid successful diagnosis and/or referral, to increase treatment adherence, patient satisfaction and patient understanding post-consultation and to potentially limit unnecessary distress, illness or access to services by the patient (Ong et al., 1995, Levinson et al., 2000, Bensing et al., 2010). Assessing these relationships in a junior doctor sample consulting in General Practice was therefore thought to have the greatest *educational* and *clinical* implications, particularly given that only a pilot study was feasible for Study 3.

How Should Attachment Styles and Emotional Intelligence Be Assessed?

The third decision to be made was how to measure participants' attachment styles and their EI. As outlined in Section 3.4 of Chapter 2, adult attachment can either be measured using self-report tools or by more in-depth interviews, dependent on the research tradition followed. It is recommended that dimensional self-report measures be used to measure attachment if the focus of the research is on relationship-centred behaviour, communication and emotions (Crowell et al., 2008) and therefore a dimensional self-report measure of attachment was selected for use in this thesis (see Section 3.6.1.1 of Chapter 4).

EI can be measured using a number of self-report questionnaires (cf Chapter 2), each with different degrees of overlap with empathy and well-established personality traits (Davies and Stankov, 1998, Lewis et al., 2005). The MSCEIT, a questionnaire designed to measure Mayer and Salovey's four-branch ability-based model of EI (Mayer and Salovey, 2000), demonstrates limited overlap with

personality traits and transient health states, and has high levels of reliability and validity (see Section 3.6.1.2 of Chapter 4). This measure was therefore chosen to assess EI throughout this thesis.

How Should Patient-Provider Communication Be Quantified?

Finally, consideration was paid to the advantages and disadvantages, from a research perspective, of the various methods available to quantify PPC.

In undergraduate medical education, a number of standardised checklists reporting varying levels of reliability and validity have been developed to assess students' PPC performances in OSCEs (Huntley et al., 2012). However, the ability of these tools to assess PPC, specifically degree of active patient participation and disclosure of psychosocial issues, is as yet unclear. Outside of undergraduate medical education, approaches taken to assess PCC in the clinical milieu are varied. Early assessments were generally exploratory and descriptive (Sheldon et al., 2011), but more recently assessment has shifted towards the micro-analysis of audio-taped or video-taped communicative behaviour using coding schemes. Application of such coding schemes can allow for the sequential process of communication between doctor and patient to be assessed and for the contribution of both parties to be considered.

There are a number of coding schemes which have been developed to allow for quantification and analysis of PPC. These include the Medical Interview Process System (Ford et al., 2000), the Roter Interaction Analysis System (Roter, 1991), the Medical Interview Aural Rating Scale (Heaven and Green, 2001) and the VR-CoDES (Del Piccolo et al., 2009). Whilst differences in the exact definition of terms exist between coding schemes, most code specific behaviours, utterances and/or cues within the consultation. Coded data can then be summarised into categories for analysis, or can be analysed sequentially using sequence analysis to determine the probability of a behaviour occurring given the preceding behavioural sequence. Notwithstanding the length of time it takes to apply a coding scheme to data and issues of inter-rater reliability, coding specific patient and provider behaviours results in data suitable for more complex analyses and therefore may provide rich and complementary data to supplement those gained from standardised checklists, such as standardised patient satisfaction checklists (Epstein, 2006).

The findings of the empirical research planned and conducted within this thesis were thought to have potential implications for medical curricula, given that medical training is an opportune time to address any communicative difficulties prior to graduation. However, if educational interventions are to be proposed based on the findings of this research then it is was considered essential that they be based on the least biased assessments of PPC possible. It was therefore deemed necessary, given that perceptions of effective PPC differ depending on whether the perspective of a researcher, examiner, practitioner or patient is taken (Epstein, 2006), to triangulate both student and doctor PPC data using the approaches outlined above and therefore reduce bias.

After careful deliberation, both objective OSCE checklists and a coding scheme were chosen to quantify PPC in the undergraduate student sample (Studies 1 and 2). Application of coding schemes to OSCE settings is rare, given the time consuming nature of coding data. However, such an approach was considered to provide different and potentially richer information on the PPC skills and behaviours of medical students than OSCE checklists, including students' abilities to deal with simulated patients expressing cues of emotional distress, particularly given the limited overlap between validated coding schemes to measure patient-centred interviewing and examiner rated OSCE communication performance (Rouf et al., 2009). The same coding scheme was chosen for application to the junior doctor sample, to ensure comparability of findings and to maximise the richness of data. Given the importance of triangulating measurement of PPC, to reduce bias associated with use of only one tool, and to elicit patients' viewpoints (Epstein, 2006), an objective checklist of patient satisfaction with PPC was also chosen to supplement VR-CoDES data; it was not possible to apply OSCE checklists to consultations.

Summary of Part 2

Having designed the research as outlined above, fieldwork was conducted between 2010 and 2012. Part 2 is concerned with presenting the research strategy, methodology, results and conclusions of the thesis' three empirical studies.

Chapter 4 reports Study 1, an exploratory study investigating the influence of first-year medical students' attachment styles and EI on their PPC with simulated patients in an OSCE setting. Chapter 5 reports Study 2, which furthers the findings

of Study 1 by exploring the influence of second-year medical students' attachment styles and EI on their PPC with simulated patients in a more 'demanding' OSCE examination[28] than that considered in Study 1. Chapter 6 reports the findings of Study 3, an exploratory pilot study investigating the relationships between attachment style, EI and PPC in a postgraduate junior doctor sample consulting with a number of real patients in General Practice.

In Chapters 4, 5 and 6, the relevant methodological approaches and considerations are first described, including discussion of the measures and covariates employed in each study. Each of these three chapters then presents its respective data analysis plan and resulting empirical findings, and then discusses these in light of previous empirical and theoretical literature. Conclusions are drawn at the end of each study. Chapter 4, which reports on the first of the three empirical studies, will now be presented.

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[28] 'More demanding examination' is a term used to describe an examination consisting of consultations between student and simulated patient in which the student is required to elicit clinical information from the patient as well as demonstrate effective PPC. The examination is therefore more demanding than that completed in students' first year, in which they have only to demonstrate effective PPC. The more 'demanding' examination is more reflective of a consultation in the clinical milieu

Chapter 4: Study 1- Exploring the Influence of First Year Medical Students' Attachment Styles and Emotional Intelligence on their Patient-Provider Communication

1 Introduction

Part 1 located the field of enquiry and stated the thesis' overall aim: to explore the relationships between medical students' and doctors' attachment styles, EI and PPC, with specific emphasis on identifying and responding to patients' cues of emotional distress, and to propose recommendations for practice and research based on these findings. This chapter reports the rationale, methodology, results and implications relating to the first of the empirical studies, which collectively make up the thesis' empirical component.

2 Aim

To explore the influence of first-year medical students' attachment styles and EI on their PPC with simulated patients in an OSCE setting.

3 Methods

3.1 Ethical approval

Ethical approval for this study was granted by the University of Liverpool's School of Medical Education Research Ethics Committee prior to recruiting participants (see Section 1.1 of Appendix 2).

3.2 Variables

The independent variables were:

1. Medical students' attachment styles, measured using the ECR:SF (Wei et al., 2007)
2. Medical students' EI, measured using the MSCEIT (Mayer et al., 2002)

Two dependent variables were considered:

1. Examiners' judgements of medical students' PPC, measured using the Liverpool University Communication Assessment Scale (LUCAS) (Huntley et al., 2012)
2. Medical students' responses to simulated patients' cues of emotion, measured using the VR-CoDES (Del Piccolo et al., 2009)

3.3   **Research Questions and Hypotheses**

To address the thesis' overall research question - What influences do medical students' and doctors' attachment styles and EI have on their PPC - and, more specifically, their PPC with patients showing signs of emotional distress? - the following research questions and hypotheses were investigated[29]:

1. Hypothesis 1: Medical students' attachment avoidance and attachment anxiety will be negatively related to their OSCE scores

2. Hypothesis 2: Medical students' attachment avoidance and attachment anxiety will be negatively related to their proportions of 'provide space' responses (see Section 3.7.2 of this chapter for details) to simulated patients' cues of emotion

3. Hypothesis 3: Medical students' attachment avoidance and attachment anxiety will be negatively related to their proportions of 'affect focused' responses (see Section 3.7.2 of this chapter for details) to simulated patients' cues of emotion

4. Research question 1: What are the relationships between medical students' EI and their OSCE scores?

5. Research question 2: What are the relationships between medical students' EI and their proportions of 'provide space' responses' (see Section 3.7.2 of this chapter for details) to simulated patients' cues of emotion?

6. Research question 3: What are the relationships between medical students' EI and their proportions of 'affect focused' responses' (see Section 3.7.2 of this chapter for details) to simulated patients' cues of emotion?

7. Research question 4: What are the relationships between medical students' attachment styles, EI and PPC?

3.4   **Participants**

All first-year medical students at the University of Liverpool in the academic year 2009 - 2010 ($N = 358$) were invited to participate. The male to female ratio was 159 (44.41%) to 197 (55.59%). Ages ranged from 18 to 38 years old, with a mean age of 18.76 (SD = 3.05). The majority of participants (91.52%) were aged between 18 and 20 years old.

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[29] Note: specific directional experimental hypotheses (hypothesis 1, hypothesis 2 etc.) were generated where existing literature adequately predicted a certain direction. Exploratory research questions were employed (research question 1, research question 2 etc.) where such data were not available or mixed

3.4.1 **Extent of Students' Communication Skills' Teaching**

All students received a 22-week Communication for Clinical Practice module in their first year, with the explicit learning objective of developing basic PPC skills required to conduct a medical consultation. The module encompassed 22 hours of didactic teaching (11 two-hour sessions, bi-weekly) run by the Department of Clinical Psychology. The general objectives of the course were to allow students to:

1. Develop an understanding of the importance of PPC and ways in which effective PPC can be used to develop different relationships with patients.
2. Consider the kind of doctor they would like to become and the PPC style consistent with this aim.
3. Learn implicitly group communication.
4. Learn how to relate to peers, patients and other members of staff.
5. Acquire basic listening skills.
6. Rehearse and practice skills involved in:
   a. Opening an interview
   b. Listening
   c. Gathering information
   d. Building rapport and demonstrating empathy
   e. Reflecting patients' emotions
   f. Providing information in a clear comprehensible way
   g. Summarising and checking for understanding
   h. Ending sessions
7. Understand the concept of PPC "schema" and "scripts".
8. Acquire and develop an understanding (through practice) of the consequences of adopting specific PPC styles.

Students subsequently completed a multiple-station OSCE to assess their PPC competence, which consisted of four 5-minute simulated clinical encounters, with an actor playing the part of a patient. Each station was designed to assess a slightly different aspect of PPC. Two stations were history-taking stations, in which students were required to elicit information from simulated patients regarding their presenting complaints. Two were information-giving stations, in which students were required to provide simulated patients with tailored health information.

Students rotated through each station in turn and were examined on their PPC performance in each (see Section 3.5 of this chapter for details).

3.5   **Procedure for Data Collection**

Potential participants were sent an email one month before their summative communication skills OSCE (see Section 3.4.1 of this chapter) with information about the study. They were invited to ask questions by return email about participation (see Section 1.1 of Appendix 5). An announcement and the information sheet were also put up on the University of Liverpool online information portal for students one month prior to the OSCE.

The OSCE took place in May 2010. Twenty five students were examined each morning and afternoon session respectively over seven days. Students were required to attend a briefing immediately prior to their OSCE, at which they were given a study information sheet and consent form (see Sections 1.1 and 1.2 of Appendix 4) and were further reminded of the study. The reminder re-iterated that, to minimise disruption to the OSCE, all students were to be videoed in one of the four OSCE stations. Simulated patients were given the same information sheet as students and were asked to consent to their voice being recorded on the video. Students and simulated patients were assured that their data would be anonymised and treated in a confidential manner. Any student who did not complete a consent form immediately prior to the OSCE was viewed as 'non-consenting' and their video was destroyed; hence students did not need to opt-out of the study.

Students were required to wait until they were called into the examination and completed each station in turn. An examiner observed and marked each student's performance in each station using the LUCAS (see Section 3.7.1 of this chapter). For the purposes of the study, all students were videotaped during one station (the second of four stations, a history-taking station), in which they were required to conduct an initial consultation with a simulated patient presenting with symptoms of hepatitis (see Section 1.2 of Appendix 5). This station was chosen as it was optimised for the simulated patients to display hints or cues of negative emotion. Students were unaware of the simulated patient's presentation prior to the examination. The camera was positioned to only capture the student and was not manned. The remaining stations were not videoed (see Sections 1.3.1, 1.3.2 and 1.3.3 of Appendix 5 for station scenarios).

During the mandatory one hour post-examination quarantine period[30], the students were given paper copies of two questionnaires (measuring attachment style and EI; see Sections 3.6.1.1 and 3.6.1.2 of this chapter) to complete under supervision. Attendance at the OSCE was mandatory for all students wishing to progress to year two therefore no reminder emails were sent as the entire cohort was provided with an opportunity to participate.

3.6   Measures and Covariates

3.6.1   Independent Variables

3.6.1.1   Experiences in Close Relationships: Short Form

Attachment was measured with the ECR:SF (Wei et al., 2007), a 12-item self-report measure of adult attachment which takes 5-10 minutes to complete. Rationale for choosing the ECR:SF to assess attachment is outlined in the Introduction to Part 2, on page 86.

The ECR:SF is a shortened form of the Experiences in Close Relationships (ECR) questionnaire (Brennan et al., 1998), a 36-item measure developed through a factor analysis of 14 self-report measures of adult attachment completed by approximately 1100 undergraduate students. Attachment avoidance and attachment anxiety are each measured by six items, such as "I try to avoid getting too close to my partner" and "My desire to be very close sometimes scares people away" respectively.

Participants rate the degree to which the statements apply to their close relationships in general, thereby allowing extrapolation of adult attachment styles from current close relationships to a general overview of relationships (see Section 1 of Appendix 2 for a copy of the ECR:SF). Items are scored on a 7-point Likert scale with options that extend from 1 (strongly disagree) to 7 (strongly agree). Individuals receive two scores upon completion of the ECR:SF to correspond with the two attachment dimensions (see Figure 1 on page 36); each score ranges from 6 to 42. A high score represents high attachment anxiety and/or attachment avoidance and a low score represents the opposite. The two dimensions represent the underlying

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[30] The period in which students were required to remain in a 'quarantine' room for one hour to prevent communication between those who had taken the examination and those who were yet to take it

structure of adult attachment and conform to current consensus regarding its measurement (Mikulincer and Shaver, 2003).

Reliability coefficient alphas of .78 for attachment anxiety and .84 for attachment avoidance, and test–retest reliabilities of .80 and .83 for attachment avoidance and attachment anxiety respectively over a 6-month period have been reported (Wei et al., 2007). No published reliability or validity data were available for a medical student population, possibly due to the relatively recent publication of the tool, but the above studies were conducted with undergraduate students, increasing the likelihood of their results being generalisable to the populations studied within this thesis. The reliability of the ECR:SF in this study is reported in Section 3.10 of this chapter.

3.6.1.2   Mayer-Salovey-Caruso Emotional Intelligence Test

EI was measured with the MSCEIT version 2.0 (Mayer et al., 2002), a 141-item self-report performance scale designed to assess the four-branch ability model of EI (see Section 4.5 of Chapter 2). Rationale for choosing the MSCEIT to assess EI is outlined in the Introduction to Part 2, on page 86.

The MSCEIT takes approximately 30-45 minutes to complete and can be completed either online (on the test publisher's website) or on paper in one sitting. If completed online, the responses are automatically processed by the test publisher and are returned to the administrator. If completed on paper, responses must be inputted online to be processed by the test publisher and returned to the administrator. The author was certified to distribute and interpret the MSCEIT by the Multi-Health Systems' Organisational Effectiveness Group prior to collecting data.

The MSCEIT can be scored in one of two ways: according to either a general consensus method or an expert consensus method. In general consensus scoring, each one of the respondent's answers is scored against the proportion of a sample of 5000 respondents endorsing the same answer; for example, a person agreeing with 70% of the respondents receives a .70 score on that item. The respondent's total raw score is the sum of these proportions across the 141 items of the test. In expert scoring, the method is the same except that each of the respondent's scores are evaluated against the proportional responses of a group of 21 emotions experts (scientists and scholars from the International Society for Research in Emotions who have demonstrated a commitment to research in affective sciences). A high

correlation between general consensus and expert consensus scoring has been found; ranging from .93 to .99 (Mayer et al., 2002). The authors of the MSCEIT recommend that expert consensus scoring is used (Mayer et al., 1999); this is therefore used throughout this thesis. The test publisher computes MSCEIT scores as empirical percentages positioned on a normal distribution curve with an average score of 100 and standard deviation of 15. If a respondent receives a total EI score of 100, he or she is considered to fall within the normal range for the general population. Table 9 provides guidelines for interpreting MSCEIT scores.

Table 9

Guidelines for Interpreting Mayer-Salovey-Caruso Emotional Intelligence Test Scores[31]

MSCEIT score range	Qualitative range
69 or less	Consider development
70-89	Consider improvement
90-99	Low average score
100-109	High average score
110-119	Competent
120-129	Strength
130+	Significant strength

When scored, the MSCEIT produces a total EI score, two Area scores, four Branch scores and eight Task scores. Each Branch score is a composite of scores on two Tasks. The faces and pictures Tasks make up Branch 1 (perceiving emotions), the sensations and facilitation Tasks make up Branch 2 (using emotions to facilitate thought), the blends and changes Tasks make up Branch 3 (understanding emotions) and the emotion management and emotional relationships Tasks make up Branch 4 (managing emotions) (Mayer et al., 2002). The Branch scores in turn are grouped into two Area scores; Experiential EI is a composite of Branches 1 and 2 and Strategic EI is a composite of Branches 3 and 4. Overall EI is a composite of the two Area scores, and therefore reflects all four Branch scores and all eight Task scores. The structure of the MSCEIT is displayed in Figure 3.

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[31] Note: Reproduced from Mayer (2009)

Figure 3

The Structure of the Mayer-Salovey-Caruso Emotional Intelligence Test
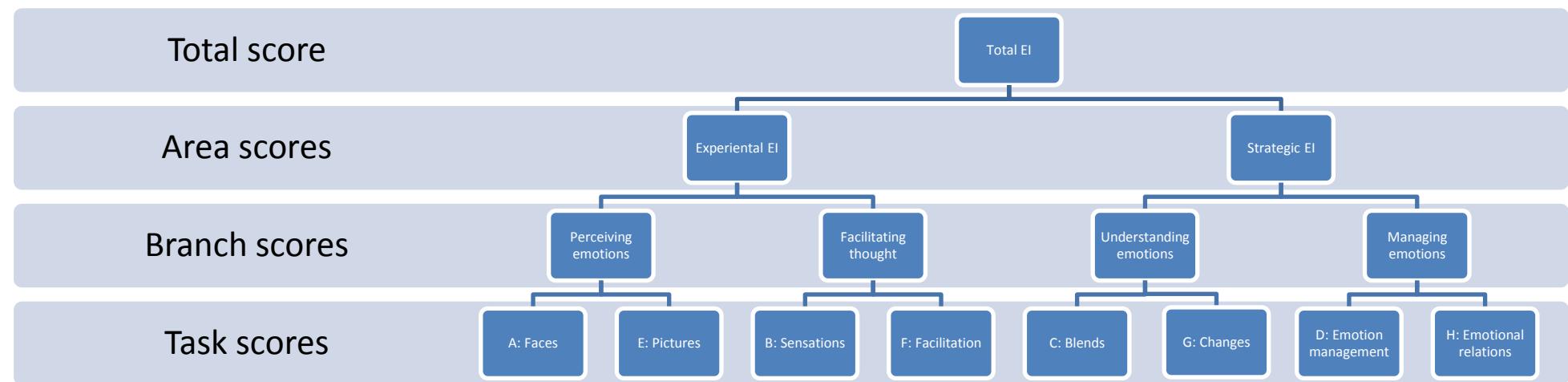
The components of the Area and Branch scores are summarised in Table 10; copyright precluded inclusion of the MSCEIT in the Appendix.

Table 10

Summary of Main Components of the Mayer-Salovey-Caruso Emotional Intelligence Test

Area Scores	Experiential Emotional Intelligence	Ability to perceive emotional information, relate it to other sensations and use it to facilitate thought
	Strategic Emotional Intelligence	Ability to understand emotional information and use it for planning and self-management
Branch Scores	Perceiving Emotions	Ability to identify emotions in self and/or others
	Facilitating Thought	Ability to use emotions to improve thinking
	Understanding Emotions	Ability to understand complexities of emotional meanings/situations/transitions
	Emotional Management	Ability to manage emotions in own life and/or others' lives

Whilst concerns have been raised about the psychometric properties of EI questionnaires (Davies and Stankov, 1998; cf Chapter 2), published data on undergraduate students suggests that the MSCEIT is reliable at both the full-scale level and the Area and Branch levels (Mayer et al., 2003, Brackett and Salovey, 2006). Mayer and colleagues (2002) reported a full-scale reliability of .92, with Area reliabilities of .90 and .85 for Experiential and Strategic EI scores respectively. However, research indicates less than optimally reliable individual Task scores, with full-test split-half reliabilities[32] of individual Tasks of between .48 and .88 (Mayer et al., 2003, Mayer et al., 2002, Livingstone and Day, 2005, Palmer et al., 2005). The

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[32] The correlation between the two Task scores making up a Branch score

four Branch scores measuring the specific skill areas, the two Area scores and the overall EI score were therefore used throughout this thesis. The Task scores were not considered due to low reliability and because cautious interpretation, if at all, is recommended by the test publishers (Mayer et al., 2002). The reliability of the MSCEIT for the participant sample in the current study is reported in Section 3.10 of this chapter.

3.7 Dependent Variables

3.7.1 The Liverpool University Communication Assessment Scale

Examiners[33] assessed students' PPC in each OSCE station using the LUCAS (Huntley et al., 2012), a 10-item standardised checklist designed to assess PPC competence and reduce examiner variation. Rationale for choosing the LUCAS to quantify students' PPC in the OSCE is also outlined in the Introduction to Part 2; Section 2 of Appendix 2 contains a copy of the LUCAS.

The LUCAS is the chosen method of PPC assessment for first-year students at the University of Liverpool and was informed by a systematic review of the psychometric and conceptual properties of existing PPC skills' assessment tools (Huntley et al., 2012). It contains items designed to measure students' global skills, specific skills, professional behaviours and specific behaviours such as introduction and identity check. Examiners rate students' performances during the consultation on 10 items:

1. Greeting and introduction
2. Identity check
3. Audibility and clarity of speech
4. Non-verbal behaviour
5. Questions, prompts and/or explanations
6. Empathy and responsiveness
7. Clarification and summarising
8. Consulting style and organisation
9. Professional behaviour
10. Professional spoken/verbal content

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[33] Practitioners, faculty members and post-graduate students within the Faculty of Health and Life Sciences, trained in the use of the LUCAS and examination of OSCEs

Items 1 and 2 are scored either competent (= 1) or unacceptable (= 0). Items 3-8 inclusive are scored either competent (= 2), borderline (= 1) or unacceptable (= 0). Items 9 and 10 are scored either competent (= 2) or unacceptable (= 0). The highest possible score on the LUCAS is 18 for each station and therefore 72 overall for the four-station OSCE. Examiners are also asked to rate students' performances on a six-point Likert scale ranging from 'excellent' to 'not yet competent'. This rating does not form part of the total score but provides a subjective assessment of examiners' perceptions of students' competence.

The LUCAS demonstrates acceptable reliability (intra-class correlation coefficient of .73) and validity with each item correlating significantly with simulated patients' ratings of first-year students' PPC in summative OSCEs (Huntley et al., 2012). The inclusion of a variety of scoring options increases the reliability of the LUCAS by combining global scores and categorical sums (Rushforth, 2007). The reliability of the OSCE used in the current study is reported in Section 3.10.2 of this chapter.

3.7.2 The Verona Coding Definition of Emotional Sequences

The VR-CoDES (Del Piccolo et al., 2009) was used to quantify PPC in the videoed OSCE station and thus provide data to supplement LUCAS scores. Rationale for choosing the VR-CoDES to quantify students' PPC is outlined in the Introduction to Part 2, on page 86.

The VR-CoDES is a coding scheme that allows for micro-analysis of PPC by quantifying patients' cues of emotional distress and providers' associated responses. It was developed by the Verona Network for Sequence Analysis to provide a consensus definition of cues and concerns and healthcare providers' responses. The aim of developing the VR-CoDES was to resolve some of the difficulties reported in synthesising the results of PPC studies employing different coding methods (Del Piccolo et al., 2009).

The VR-CoDES handbook defines a cue as "*a verbal or non-verbal hint which suggests an underlying unpleasant emotion and that lacks clarity",* and a concern as "*a clear and unambiguous expression of an unpleasant current or recent emotion where the emotion is explicitly verbalised*" (Del Piccolo et al., 2009). Cues can further be categorised into one of seven categories (see Section 4.1 of Appendix

6). Responses to a patient's cue or concern can be categorised into one of 17 categories. These are displayed in Table 11, along with the steps taken to code providers' responses.

Table 11

Steps in Coding Providers' Responses to Cues

1. Key elements of cue referred to?	2. Provider's response allows further discussion of emotion?	3. What specific behaviour does the provider use to respond to the cue?	4. Which VR-CoDES category is appropriate?
No	No	Ignores the cue	Ignore
		Actively shuts down or moves away from the cue	Shutting down
		Provides advice or reassurance	Non-explicit info advise
No	Yes	Clearly pauses for 3 seconds or more to allow the patient to say more	Silence
		Employs response which encourages further disclosure through minimal prompt	Back channel
		Acknowledges the cue without referring to it explicitly	Acknowledge
		Explicitly seeks further disclosure from the patient	Active invitation
		Provides space for further disclosure through responding in an empathic way	Implicit empathy
Yes	No	Changes the frame of reference of the cue and clearly refers to cue	Switching

Table 11 Continued

1. Key elements of cue referred to?	2. Provider's response allows further discussion of emotion?	3. What specific behaviour does the provider use to respond to the cue?	4. Which VR-CoDES category is appropriate?
Yes	No	Suggests explicitly that further exploration of the cue will be delayed	Postponing
		Provides advice or reassurance	Information advise
		Expresses an explicit refusal to talk about the cue	Active blocking
Yes	Yes	Explicitly acknowledges the factual content of the cue	Content acknowledgement
		Explicitly asks for more information regarding the factual content of the cue	Content exploration
		Explicitly refers to the affective content of the cue	Affective acknowledgement
		Explicitly asks for more information regarding the affective content of the cue	Affective exploration
		Empathises with the patient and refers to the affective content of the cue	Empathy

Providers' responses can be further sub-categorised (Del Piccolo et al., 2009) to calculate proportions of:

1. 'provide space' responses (in which the provider provides the patient with an opportunity to further discuss the cue/concern)[34]

2. 'affect focused' responses (in which the provider provides the patient with an opportunity to further discuss the cue/concern by explicitly referring to its affective element)[35]

Data indicate high inter-rater reliability[36] for the VR-CoDES, with Cohen's kappas[37] of .70 (Zimmermann et al., 2011, Eide et al., 2011) and .90 (Del Piccolo et al., 2011) for cues and concerns together and of 1.00 and .64 for concerns and cues respectively (Vatne et al., 2010). These coefficients indicate the comprehensibility of the VR-CoDES training manual and process. However, these data amount to merely internal validity; assessment of the external validity of the VR-CoDES is difficult as there is no gold-standard to adhere to when coding PPC (Scheffer et al., 2008). The most widely advocated method of establishing validity is to compare researchers' ratings with those of experts, or to consider the relationship between researchers' coding of cues and concerns and patients' subjective experiences of their cues and concerns. Eide (2011) used the latter approach to examine the validity of the VR-CoDES when applied to 12 nursing consultations with fibromyalgia patients. Patients watched their coded consultations back in a meta-interview and identified when they were expressing emotion. Results established a sensitivity of .95 and a specificity of .99 in identifying patients' cues and concerns when a directed approach was taken and a sensitivity of .99 and specificity of .70 when an open approach was taken, thus suggesting the applicability and validity of using the VR-CoDES to quantify patients' expressions of emotional distress and associated providers' responses. As no published reliability data existed at the time of writing for the

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[34]'Provide space' responses include silence, back channel, acknowledge, active invitation, implicit empathy, content acknowledgement, content exploration, affect acknowledgement, affect exploration and explicit empathy

[35] 'Affect focused' responses include affect acknowledgement, affect exploration and explicit empathy

[36] Inter-rater reliability is the degree of agreement among raters

[37] Cohen's kappa is a statistical measure of inter-rater reliability for quantitative (categorical) items

application of the VR-CoDES to a medical student sample, it was deemed essential to establish good inter-rater reliability prior to coding (see Section 3.7.3 of this chapter).

3.7.3 **Inter-Rater Reliability (Verona Coding Definition of Emotional Sequences)**

Prior to collecting data, the author was trained to use the VR-CoDES by IF[38], an experienced coder who helped to develop the VR-CoDES (hereby referred to as an 'expert coder'). This training began in September 2009 and ended in February 2010. The author firstly read the VR-CoDES manual and was given six transcripts of consultations on which to practice identification of cues and concerns. These transcripts were then jointly coded in a training meeting and the author was provided with subsequent transcripts to code independently. Once 100% face agreement was reached on identification of cues and concerns, a further random sample of 20 transcripts were coded to establish sufficient inter-rater reliability.

Given the lack of published reliability data, discussed in Section 3.7.2 of this chapter, an intra-class correlation coefficient of.80 was selected as a rigorous and acceptable minimum standard of inter-rater reliability. This was determined in line with the stringent inter-rater reliability values proposed by Shrout (1998), who considered the range .61 to .80 to indicate 'moderate', and .81 to 1.0 to indicate 'substantial' inter-rater reliability. An intra-class correlation of .93 was established, using the stringent 'absolute agreement' definition, indicating high levels of reliability between the expert coder and the author. A further random sample of 20 transcripts was coded for responses, following the procedure outlined above. Intra-class correlation coefficients[39] of .84 ('provide space' responses) and .87 ('reduce space' responses) were obtained, thus indicating that the author had exceeded the required level of inter-rater reliability to code data independently using the VR-CoDES. Nonetheless, regular supervision meetings with the expert coder continued to take place throughout the coding process.

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[38] IF, at the time of training, was a Research Tutor within the Department of Clinical Psychology at the University of Liverpool and is a co-supervisor of this thesis

[39] An intra-class correlation coefficient is a measure of agreement or consensus between raters

3.8 Additional Data Collection

Post-examination, consenting students' overall OSCE scores[40] and demographic data were obtained from the medical school. By consenting to participate, students were aware that they were allowing access to such information. Figure 4 shows the process from recruitment to analysis.

Figure 4

Flow Diagram to Show Study Recruitment and Procedure

September 2009	• Students began first year of medical school
March-May 2010	• VR-CoDES training and reliability check completed
May 2010	• Ethical approval for student sudy obtained from University of Liverpool School of Medicine Research Ethics Committee • OSCEs took place • One station videotaped, questionnaire data collected (ECR:SF and MSCEIT), OSCE scores collected
June 2010	• Questionnaire data entered into a database • OSCE videos transferred to electronic files • Additional data collected
June-November 2010	• OSCE videos coded • Analyses conducted

3.9 Data Management and Preparation

All data from returned questionnaires were entered into a Statistical Package for the Social Sciences (SPSS) version 20.0.1 database (IBM Corp, 2012b). Library

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[40] Mean score across all four stations, expressed as a percentage and hereafter referred to as 'overall OSCE score'

card numbers acted as unique identifiers for each participant, with the author having no access to students' identifying information to ensure that anonymity of participants was not compromised. MSCEIT data were entered online using the test publisher's website; the test publisher converted the raw MSCEIT scores into standard scores using UK normative values. The relevant ECR:SF items were reverse scored and attachment dimension scores were calculated for each participant. Hard copies of all questionnaires were stored in a locked filing cabinet in the author's office.

Non-consenting students' video data were destroyed immediately post-OSCE. Consenting students' video data were transferred into individual MPEG digital computer files, labelled with the same unique identifiers as the questionnaires. These files were stored on a password-protected hard drive in the author's office. Videos were coded using FOCUS III software (FOCUS III [computer software], 2011); each video took 15–20 minutes to code. The coding records were saved in Microsoft Excel and entered into SPSS for analysis purposes.

3.10   Data Analysis

3.10.1 Justification for Sample Size

A priori sample size calculations were performed to determine the minimum number of participants required to achieve adequate statistical power for the most complex statistical analysis conducted: structural equation modelling (SEM)[41]. The minimum sample size required for an adequately powered SEM varies according to the number of estimated parameters, the reliability of the variables, the strength of correlations between the variables and the amount of missing data (Muthén and Muthén, 2002). Iacobucci (2010) states that, for a model estimating parameters with maximum likelihood estimations[42] and assessing the fitness of the data using a chi-

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[41] Structural Equation Modelling is a statistical technique for testing and estimating causal relations using a combination of statistical data and qualitative causal assumptions
[42] Maximum likelihood estimation is a method of estimating the parameters of a statistical model, which selects the set of model parameters which maximises the likelihood function

squared test[43], a sample size of at least 50 participants is necessary provided that chi-squared divided by the degrees of freedom is < 3. Others state that at least 100 and preferably 200 cases are required (Garver and Mentzer, 1999, Hoelter, 1983), with sample sizes under 100 considered untenable by some authors (Kline, 1998). The general consensus is that a model should include at least 10 participants for every estimated free parameter (Westland, 2010, Schreiber, 2008). In the current study, the model tested had 10 parameters to be estimated (including regression weights, covariances and variances), indicating a minimum required sample size of 100 (Schreiber, 2008).

The whole first-year medical student cohort ($N = 358$) was invited to participate (see Section 3.5 of this chapter). The study recruited 200 participants, of which 167 were included in the SEM, thus providing theoretically adequate power for the analyses. However, given the theoretical uncertainty around adequate power for analysis, bootstrapping[44] was applied ($n = 500$) to obtain best estimates of model parameters and more accurately assess the significance of the direct and indirect effects of the independent variables. To maximise statistical power throughout the analyses, participants were analysed as a whole group unless otherwise stated; gender was not considered in the SEM as the sample size was not large enough to split and cross-validate the model with sufficient power to detect moderate effect sizes and demonstrate its stability.

3.10.2 Pre-Analyses

Prior to analysis, data were screened for imputation errors and summary scores were calculated from raw data as appropriate. Due to relatively small numbers of concerns (cf Section 4.4.2.1 of this chapter), all cue and concern data were collapsed together irrespective of type[45] and proportion of 'provide space' and 'affect focused' responses were calculated for each participant.

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[43] A Chi-squared test is a parametric test which compares the means between two unrelated groups on the same continuous, dependent variable to determine whether they differ from each other
[44] Bootstrapping is a form of re-sampling, in which the properties of an estimator are estimated by simulation, such as by measuring those properties when re-sampling from the original data
[45] Referred to from this point forward as 'cues' unless otherwise stated

A generalisability analysis[46] (G-study) was then conducted with anonymised OSCE data for the whole cohort ($N = 358$) to estimate the overall reliability (G-coefficient) of the examination. The G-study used a student by rater ($n = 30$) nested in OSCE stations ($n = 4$) design. The G-coefficient[47] was .72 indicating acceptable levels of reliability (Nunnally, 1978). The G-analysis supported the rationale to use students' mean score across the 4 OSCE stations as an acceptable measure of their PPC rather than consider individual station scores, as adopted throughout the analysis.

Cronbach's alphas[48] were then calculated for the ECR:SF and MSCEIT (shown in Table 12) to estimate their overall reliabilities. In line with the recommendations of Nunnally (1978), .70 was considered the minimum alpha reliability level for items to be acceptably used together as a scale or sub-scale. The resulting Cronbach's alphas mirrored previous research (Brackett and Salovey, 2006, Mayer et al., 2002, Mayer et al., 2003, Wei et al., 2007) and supported the reliability of the scales employed in this study.

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[46] A generalisability analysis is a statistical analysis used to evaluate the dependability ('reliability') of behavioural measurements

[47] A G coefficient, or generalisability coefficient, is a measure of reliability

[48] Cronbach's alpha is a coefficient of internal consistency, calculated to estimate the reliability of psychometric tests

Table 12

Reliability of Measures Used

Measure	Scale or sub-scale	Cronbach's alpha coefficient
ER: SF	Attachment avoidance	.75
ER: SF	Attachment anxiety	.74
MSCEIT	Branch 1 (Perceiving Emotions)	.91
MSCEIT	Branch 2 (Facilitating Thought)	.76
MSCEIT	Branch 3 (Understanding Emotions)	.85
MSCEIT	Branch 4 (Managing Emotions)	.84
MSCEIT	Area 1 (Strategic EI)	.95
MSCEIT	Area 2 (Experiential EI)	.93
MSCEIT	Total EI	.94

Variables were subsequently checked for normality of distribution and homogeneity of variance to investigate the fit of data within the assumptions of parametric tests[49]. Normality of distribution was investigated using Kolmogorov-Smirnov tests[50]; values of skewness and kurtosis and graphical representations of distributions were also considered to make informed decisions (Field, 2009). Homogeneity of variance was investigated using Levene's test[51].

3.10.3 Descriptive and Exploratory Analyses

Pearson's product-moment correlations[52], independent sample *t*-tests[53], chi-squared tests and graphical plots were used as appropriate for initial data exploration and subsequent research question and hypothesis testing. The predictive influences

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[49] Note: not reported in the results unless significant

[50] A Kolmogorov-Smirnov test is a non-parametric test which can be modified to serve as a test of normality of distribution

[51] Levine's test is an inferential statistic used to assess the equality of variances in different samples

[52] Pearson's product moment correlation is a parametric test of association which estimates the correlation (linear dependence) between two variables

[53] An independent sample *t*-test is a statistical test used to determine whether distributions of categorical variables differ from each other

of gender, age and the independent variables on overall OSCE scores were then investigated using hierarchical (blockwise entry) multiple regression[54].

Based on the theoretical literature reported in Chapter 2, a hypothetical model of the relationships between medical students' attachment styles, EI and PPC was then developed. An SEM analysis (specifically a path analysis[55] with observed variables) was then fitted to the data to capture overall model fit, including dependency between variables used in the regression analysis. This analysis method was chosen as it has several advantages over multiple regression modelling, including the ability to test models overall rather than coefficients individually, the ability to model mediating variables rather than be restricted to an additive model, the ability to model error terms and the robustness of its assumptions, particularly regarding multicollinearity and assessment of relative model fit (Garson, 2012). Following Kline's (1998) guidelines, model parameters were estimated with maximum likelihood estimations (chosen to yield optimal parameter estimates) and a chi-squared test assessed fitness of data to hypothesised model fit. A non-significant chi-squared result indicates a good model fit by indicating no significant difference between the model's covariance structure and the observed covariance matrix. However, as chi-squares may be misleading due in part to their sensitivity to violations of the assumption of multivariate normality, additional model fit indices were also taken into consideration. These included the comparative fit index (CFI)[56], the root mean square error of approximation (RMSEA)[57], and the chi-squared

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[54] Hierarchical (blockwise entry) multiple regression is a form of linear regression, a statistical method to model the relationships between a scalar dependent variable and more than one explanatory variables. In hierarchical (blockwise entry) multiple regression, the researcher specifies, a priori, a sequence for sets of predictor variables, determined to share some common theoretical background. The variables selected for a set are then entered into a specified, theoretically-based sequence, with known predictors entered first and hypothesised predictors entered last.

[55] Path analysis is a form of Structural Equation Modelling in which only single indicators are employed for each of the variables in the causal model.

[56] The CFI analyses the model fit by examining the discrepancy between the data and the hypothesized model, while adjusting for the issues of sample size inherent in the chi-squared test of model fit, and the normed fit index. CFI values range from 0 to 1, with larger values indicating better fit; a CFI value of .90 or larger is generally considered to indicate acceptable model fit.

[57] The RMSEA avoids issues of sample size by analysing the discrepancy between the hypothesized model, with optimally chosen parameter estimates, and the population covariance matrix. The RMSEA ranges from 0 to 1, with smaller values indicating better model fit. A value of .06 or less is indicative of acceptable model fit.

statistic divided by the degrees of freedom (CMIN/ d.f.)[58]. An acceptable model is indicated by a CFI of ≥ .95, an RMSEA of ≤ .06 (Hu and Bentler, 1999), and a CMIN/ d.f. of < 3 (Byrne, 2010).Given that the model included data from 167 participants, particular attention was paid to the RMSEA and CFI as they are less sensitive to overestimation of goodness of fit where sample size is less than 200 (Fan et al., 1999).

Bootstrapping was applied (n = 500) to obtain best estimates of model parameters and more precisely assess the significance (in conjunction with the bias-corrected confidence intervals) of the direct and indirect effects of attachment and EI on overall OSCE scores. Bootstrapping is advised when testing mediation and suppression effects due to its robust estimates of standard errors and confidence intervals (Cheung and Lau, 2008).

3.10.4 **Software Used for Analysis**

All analyses were performed in SPSS version 20.0.1 (IBM Corp, 2012b), with the exception of the generalisability analysis, conducted using EduG (Cardinet et al., 2009), and SEM, conducted using AMOS 20.0 (IBM Corp, 2012a).

3.10.5 **Additional Considerations**

Figures are reported to two significant figures throughout the results section. Two tailed analyses[59] were used throughout; findings were considered statistically significant at the $p < .05$, the $p < .01$ and the $p < .001$ levels. To minimise the chances of Type I errors[60], no analyses were conducted on individual-level data (such as individual LUCAS items). Exact p-values[61] are presented in the text; tables summarise whether findings were significant at the $p < .05$ level, the $p < .01$ level and the $p < .001$ level using *, ** and *** respectively. Correlation effect sizes are reported where appropriate and interpreted using standard conventions: small effect

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[58] CMIN/d.f. is a test to assess the fit of a model in confirmatory factor analysis and modelling in which the minimum discrepancy $\hat{C}$ is divided by its degrees of freedom

[59] A two-tailed hypothesis is one which does not specify the direction of a difference or correlation

[60] A Type I error is an incorrect rejection of a true null hypothesis

[61] A p-value is the attained level of significance. A significant p-value indicates the smallest level of significance for which the observed sample statistic indicates rejection of the null hypothesis

size, $r = .10 - .23$; medium effect size, $r = .24 - .36$; and large effect size, $r \geq .37$ (Cohen, 1992). When reporting the results of the SEM, the reporting conventions of the American Psychological Association (2009) are followed. In line with these recommendations, the chi-square and its significance are presented in the results to provide the reader with information relating to the data's degree of divergence from the model (Schumacker and Lomax, 2004) but where other fit tests indicated good approximate fit, the significance of the chi-square is discounted. The results will now be presented.

4 Results

4.1 Introduction

Descriptive data and summary statistics are provided for the sample, and these are examined for differences between participants and non-participants. Preliminary analyses are then presented, followed by Section 4.6, which reports the results of analyses addressing the hypotheses and research questions. The section concludes with a summary of overall findings.

4.2 Descriptive Analyses

4.2.1 Response and Attrition Rates

Out of the sample of 358 medical students approached, 200 students (55.87%) participated. Figure 5 shows the process from recruitment to analysis. One hundred and eighty four students (51.40%) completed the ECR:SF, 184 students (51.40%) completed the MSCEIT and 167 students (46.65%) completed both. An additional 33 participants (9.22%) partially completed the MSCEIT; these were excluded from analysis due to the large amount of missing data (Little and Rubin, 1987). There were no missing data in the questionnaires returned from the other participants. At the time of writing, no participant had asked for their data to be excluded from the study. Video data were available for 184 of the 200 consenting students (92.00%); the remaining 16 videos were unusable due to sound error.

4.2.2 Sample Demographics and Comparison with Non-Participants

Eighty eight male students (44.00%) and 112 female students (56.00%) participated, with a mean age of 18.89 years (SD = 3.05). The majority of participants (n = 133, 66.50%) were White British. There were no significant differences in participating and non-participating students in terms of age ($t(356)$= 1.36, p =.18) or gender ($\chi^2(1)$ = 1.52, p =.36) (see Section 3.4 of this chapter for wider discussion of sample demographics).

Figure 5

Flow Diagram from Recruitment to Analysis: Study 1

| Sample of first-year medical students invited to participate
 n = 358 | → | All students videoed in one OSCE station
 n = 358 (100%) | → | Students who consented and completed ≥1 questionnaire ('participants')
 n = 200 (55.87%) | → | OSCE video data available for analysis
 n = 184 (51.40%) | → | Video data for consenting students coded and analysed
 n = 184 (51.40%) |

Students who completed the ECR:SF
n = 184 (51.40%)

Students who completed the MSCEIT
n = 184 (51.40%)

Students who completed the ECR:SF only
n = 17 (4.75%)

Students who completed both the MSCEIT and the ECR:SF
n = 167 (46.65%)

Students who completed the MSCEIT only
n = 15 (4.19%)

4.3   Independent Variables

4.3.1   Attachment Styles

Of the 200 participants, 184 completed the ECR:SF. Eighty one participants (44.00%) were male and the remaining 103 (56.00%) were female. Participants' attachment anxiety scores were higher than their attachment avoidance scores ($M = 20.77$, $SD = 5.89$ and $M = 17.61$, $SD = 5.91$ respectively). Figure 6 plots the spread of participants' attachment avoidance and attachment anxiety scores.

Figure 6

Attachment Avoidance and Attachment Anxiety Dimension Scores: Study 1
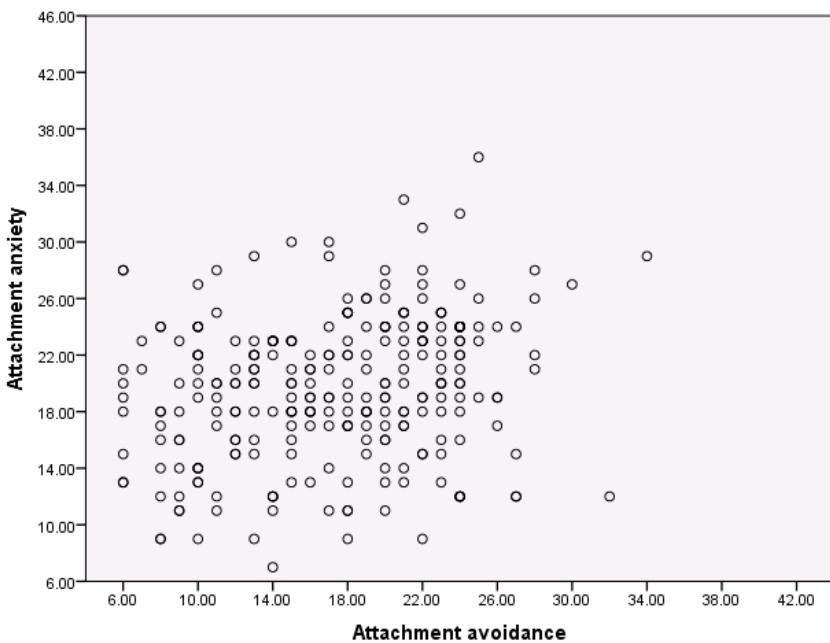
Female participants scored higher on attachment anxiety ($M = 19.25$, $SD = 5.18$) than male participants ($M = 21.95$, $SD = 6.14$), $t(182) = 3.18$, $p = .00$. There were no significant differences between males and females on attachment avoidance.

4.3.2   Emotional Intelligence

Of the 200 participants, 184 participants completed the MSCEIT. Eighty three participants (45.11%) were male and the remaining 101 (54.89%) were female. Participants' mean total EI score was 84.00 ($SD = 17.46$). Table 13, overleaf, shows the mean score, standard deviation and range for MSCEIT scores.

Table 13

Mayer-Salovey-Caruso Emotional Intelligence Test Scores: Study 1

MSCEIT score	*M*	*SD*	Minimum score	Maximum score
Branch 1 (Perceiving Emotions)	90.62	15.20	30.02	132.19
Branch 2 (Facilitating Thought)	91.09	18.29	44.06	133.98
Branch 3 (Understanding Emotions)	89.31	17.30	44.39	132.73
Branch 4 (Managing Emotions)	84.67	16.76	46.03	124.12
Area 1 (Experiential EI)	88.50	17.17	33.32	130.55
Area 2 (Strategic EI)	85.30	16.77	37.23	122.98
Total EI	84.00	17.46	33.17	129.20

The majority of participants' scores fell into the 'consider improvement' category (see Table 9 on page 99), with participants scoring lowest on Branch 4 (Managing Emotions), Area 1 (Experiential EI) and total EI. Table 14 shows the mean score, standard deviation and range for MSCEIT scores split by gender.

Table 14

Mayer-Salovey-Caruso Emotional Intelligence Test Scores Split by Gender: Study 1

MSCEIT score	Males (n=83) *M (SD)*	Females (n=101) *M (SD)*
Branch 1 (Perceiving Emotions)	89.24 (15.04)	81.75 (15.34)
Branch 2 (Facilitating Thought)	88.06 (18.80)	93.57 (17.57)
Branch 3 (Understanding Emotions)	86.34 (18.58)	91.74 (15.85)
Branch 4 (Managing Emotions)	79.29 (14.63)	89.11 (17.15)
Area 1 (Experiential EI)	85.82 (16.78)	90.71 (17.26)
Area 2 (Strategic EI)	80.79 (16.81)	89.01 (15.88)
Total EI	79.60 (16.62)	87.63 (17.38)

* = significant at $p <.05$,   ** = significant at $p <.01$,   *** = significant at $p <.001$

Female participants scored higher than male participants in all Branch, Area and Total scores, with the exception of Branch 1 (Perceiving Emotions); differences were statistically significant in Branch 2 (Facilitating Thought) ($t(182) = 2.05$, $p = .00$), Branch 3 (Understanding Emotions) ($t(182) = 2.13$, $p = .01$) and Branch 4

(Managing Emotions) (t(182) = 4.14, p = .00), Area 2 (Strategic EI) (t(182) = 3.40, p = .00) and total EI (t(182) = 3.18, p = .00).

4.4 Dependent Variables

4.4.1 Objective Structured Clinical Examination Scores

Overall OSCE scores were obtained for all 200 participants. Participants' scores ranged from 12.75 to 18. The mean total score was 16.52 (SD = .95), translating into a mean percentage of 91.78%. There were no relationships between overall OSCE score and age (r = .01, p = .86). Female students' OSCE scores were significantly higher than males' (M = 92.61, SD = .79 and M = 90.39, SD = 1.11 respectively, t(198)= .28, p = .00).

4.4.2 Verona Coding Definition of Emotional Sequences Data

Video data from the OSCE were available for 184 participants. Eighty one participants (44.02%) were male and the remaining 103 (55.98%) were female.

4.4.2.1 Number of Cues

In total, 1317 utterances of emotion were observed across the 184 coded interviews, of which 1033 (78.44%) were cues and 284 (21.56%) were concerns[62]. The mean total number of cues per consultation (i.e. per 5-minute interaction between student and simulated patient) was 7.14 (SD = 3.24) with number of cues ranging from 0 to 32. One interview (0.50%) contained no cues. Two-fifths (39.71%) of students had less than 7 cues per interview, and 26.67% had more than 7 cues per interview. No significant relationship between age and number of cues was observed (r = .09, p = .35) and no significant differences were found in the number of cues elicited per consultation relative to gender (M = 7.07, SD = 2.73 for female students and M = 7.23, SD = 3.61 for male students, t(182) = .32, p = .32).

4.4.2.2 Responses to Cues

Individual responses to simulated patients' cues are reported in Table 15.

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[62] Hereby referred to collectively as 'cues'

Table 15

Participants' Responses to Simulated Patients' Cues: Study 1

Response category	Response	Frequency ($N = 1317$)	% of total responses	% per category
Non-explicit/ Reduce space	Ignore	86	6.53	11.33
	Shutting down	22	1.67	
	Non-explicit info advise	41	3.13	
Explicit/ Reduce space	Switching	272	20.65	21.94
	Postponing	0	0.00	
	Information advise	15	1.14	
	Active blocking	2	0.15	
Non-explicit/ 'provide space'	Silence	0	0.00	12.78
	Back channel	19	1.44	
	Acknowledge	15	1.14	
	Active invitation	103	7.82	
	Implicit empathy	30	2.38	
Explicit/ 'provide space'	Content acknowledgement	69	5.24	53.94
	Content exploration	448	34.02	
	Affective acknowledgement	57	4.33	
	Affective exploration	105	7.97	
	Affective empathy	30	2.38	

Content exploration was the most frequent type of response by participants to patients' cues and the largest proportion of responses were in the 'explicit 'provide space' category.

Table 16 gives frequencies and percentages of 'provide space' and 'affect focused' responses to cues.

Table 16

Participants' 'Provide Space' and 'Affect Focused' Responses to Simulated Patients' Cues: Study 1

Response Category	Frequency (*N* = 1317)	% of total responses (SD)	Range (%)
'Provide space' responses	876	66.70 (7.91)	0.00-100.00
'Affect focused' responses	192	14.21 (14.41)	0.00-85.71

Mean percentage of 'provide space' responses for all participants was 66.70% (*SD* = 7.91), with a range of 0% to 100%. No significant relationships between age and proportions of 'provide space' responses were observed ($r = -.04$, $p = .63$) and no significant differences were found in mean proportions of 'provide space' responses based on participants' gender (*M* = 66.32, *SD* = 20.03 for female students and *M* = 65.88, *SD* = 21.11 for male students, $t(182) = .94$, $p = .57$).

Mean percentage of 'affect focused' responses for all participants was 14.21% (*SD* = 14.41), with a range of 0% to 85.71%. No significant relationship between age and proportion of 'provide space' responses was observed ($r = -.04$, $p = .57$) and no significant differences were found in mean proportion of 'affect focused' responses based on participants' gender (*M* = 15.78, *SD* = 14.53 for female students and *M* = 12.36, *SD* = 14.13 for male students, $t(182) = 1.67$, $p = .42$).

4.5 Exploratory Analyses

4.5.1 Relationships between Independent Variables

The relationships between attachment and EI were examined for the whole participant sample (Table 17).

Table 17

Correlations between Attachment and Emotional Intelligence: Study 1

MSCEIT score	Attachment avoidance	Attachment anxiety
Branch 1 (Perceiving Emotions)	-.21**	-.12
Branch 2 (Facilitating Thought)	-.23**	-.23**
Branch 3 (Understanding Emotions)	-.20**	-.02
Branch 4 (Managing Emotions)	-.28**	-.10
Area 1 (Experiential EI)	-.26**	-.19
Area 2 (Strategic EI)	-.27**	-.08
Total EI	-.28**	-.16

* = significant at $p < .05$,   ** = significant at $p < .01$,   *** = significant at $p < .001$

Significant negative correlations between attachment avoidance and all Branch, Area and total EI scores were found. Attachment anxiety was significantly negatively related to Branch 2 (Facilitating Thought), Area 1 (Experiential EI) and total EI. Attachment avoidance and EI were therefore found to be related in the student sample studied and were therefore as related variables throughout subsequent analyses.

4.5.2 Relationships between Dependent Variables

No significant relationships were observed between students' overall OSCE score and either their proportions of 'provide space' responses ($r = .14$) or their proportions of 'affect focused' responses ($r = .14$). These variables were therefore treated as independent outcome measures throughout subsequent analyses.

4.5.3 Investigation of the Potential Confounding Influence of Cues on 'Provide Space' Responses/'Affect Focused' Responses

The relationships between number of cues and proportions of 'provide space' and 'affect focused' responses were examined; no significant relationships were

observed between number of cues per minute and either proportion of 'provide space' responses ($r = .06$) or proportion of 'affect focused' responses ($r = 08$). However, the positive relationships observed between number of cues and proportion of 'provide space' and 'affect focused' responses indicated that cue presentation was not negatively impacting on responses and therefore did not need further consideration in analyses.

4.6   Main analyses

4.6.1   Hypothesis 1: Medical Students' Attachment Avoidance and Attachment Anxiety will be Negatively Related to their Objective Structured Clinical Examination Scores

To address hypothesis 1, the relationships between attachment and OSCE score for the whole participant sample were examined (Table 18).

Table 18

Correlations between Attachment and Objective Structured Clinical Examination Scores: Study 1

Attachment dimension	Overall OSCE score
Attachment avoidance	-.16**
Attachment anxiety	-.06

* = significant at $p < .05$,   ** = significant at $p < .01$,   *** = significant at $p < .001$

Overall OSCE score was significantly negatively correlated with attachment avoidance ($p = .00$) but not attachment anxiety. Hypothesis 1, that medical students' attachment avoidance and attachment anxiety will be negatively related to their OSCE scores, was therefore partially supported by data.

4.6.2   Hypothesis 2: Medical Students' Attachment Avoidance and Attachment Anxiety will be Negatively Related to their Proportions of 'Provide Space' Responses

To address hypothesis 2, the relationships between attachment and proportions of 'provide space' responses were examined (Table 19, overleaf).

Table 19

Correlations between Attachment and Proportion of 'Provide Space' Responses:
Study 1

Attachment dimension	Proportion of 'provide space' responses
Attachment avoidance	.02
Attachment anxiety	-.02

* = significant at *p* <.05,   ** = significant at *p* <.01,   *** = significant at *p* <.001

No relationships were found between attachment avoidance or attachment anxiety and proportions of 'provide space' responses. Hypothesis 2, that medical students' attachment avoidance and attachment anxiety will be negatively related to their proportions of 'provide space' responses, was therefore not supported by data.

4.6.3 Hypothesis 3: Medical Students' Attachment Avoidance and Attachment Anxiety will be Negatively Related to their Proportions of 'Affect Focused' Responses

To address hypothesis 3, the relationships between attachment and proportions of 'affect focused' responses were examined (Table 20).

Table 20

Correlations between Attachment and Proportion of 'Affect Focused' Responses:
Study 1

Attachment dimension	Proportion of 'affect focused' responses
Attachment avoidance	.01
Attachment anxiety	-.10

* = significant at *p* <.05,   ** = significant at *p* <.01,   *** = significant at *p* <.001

No relationships were found between medical students' attachment avoidance or attachment anxiety and their proportion of 'affect focused' responses. Hypothesis 3, that medical students' attachment avoidance and attachment anxiety will be negatively related to their proportions of 'affect focused' responses, was therefore not supported by data.

4.6.4 Research Question 1: What are the Relationship between Medical Students' Emotional Intelligence and their Objective Structured Clinical Examination Scores?

To address research question 1, Pearson's correlations were run to examine the relationships between EI and OSCE scores (reported in Table 21).

Table 21

Correlations between Emotional Intelligence and Objective Structured Clinical Examination Scores: Study 1

MSCEIT score	Overall OSCE score
Branch 1 (Perceiving Emotions)	.05
Branch 2 (Facilitating Thought)	.23**
Branch 3 (Understanding Emotions)	.19**
Branch 4 (Managing Emotions)	.21**
Area 1 (Experiential EI)	.14
Area 2 (Strategic EI)	.21**
Total EI	.23**

* = significant at $p < .05$,   ** = significant at $p < .01$,   *** = significant at $p < .001$

Emotional intelligence was significantly correlated with overall OSCE score at both a total EI level and at the level of Area 2 (Strategic EI) and Branches 2, 3 and 4 ($p = .00$). In conclusion to research question 1, medical students' EI was positively related to their OSCE scores.

4.6.5 Research Question 2: What are the Relationship between Medical Students' Emotional Intelligence and their Proportions of 'Provide Space' Responses?

To address research question 2, the relationships between EI and proportion of 'provide space' responses were examined for the whole participant sample (Table 22, overleaf).

Table 22

Correlations between Emotional Intelligence and Proportion of 'Provide Space' Responses: Study 1

MSCEIT score	Proportion of 'provide space' responses
Branch 1 (Perceiving Emotions)	.07
Branch 2 (Facilitating Thought)	.08
Branch 3 (Understanding Emotions)	.03
Branch 4 (Managing Emotions)	.07
Area 1 (Experiential EI)	.07
Area 2 (Strategic EI)	.05
Total EI	.08

* = significant at $p < .05$, ** = significant at $p < .01$, *** = significant at $p < .001$

No relationships were found between either total EI or any Area or Branch score and proportion of 'provide space' responses. In conclusion to research question 2, medical students' EI was not related to their proportion of 'provide space' responses.

4.6.6 Research Question 3: What are the Relationship between Medical Students' EI and their Proportions of 'Affect Focused' Responses?

To address research question 3, the relationships between EI and proportions of 'affect focused' responses were examined (Table 23).

Table 23

Correlations between Emotional Intelligence and Proportion of 'Affect Focused' Responses: Study 1

MSCEIT score	Proportion of 'affect focused' responses
Branch 1 (Perceiving Emotions)	-.07
Branch 2 (Facilitating Thought)	-.12
Branch 3 (Understanding Emotions)	-.04
Branch 4 (Managing Emotions)	-.04
Area 1 (Experiential EI)	-.11
Area 2 (Strategic EI)	-.03
Total EI	-.07

* = significant at $p < .05$, ** = significant at $p < .01$, *** = significant at $p < .001$

No relationships were found between either total EI or any Area or Branch score and proportions of 'affect focused' responses. In conclusion to research question 3, medical students' EI was not related to their proportions of 'affect focused' responses.

4.6.7 Research Question 4: What is the Relationship between Medical Students' Attachment Style, Emotional Intelligence and Patient-Provider Communication?

4.6.7.1 Hierarchical Regression

Given the lack of significant correlations observed between attachment, EI and responses to simulated patients' cues, no regression model of these data was attempted. However, significant relationships between attachment avoidance, EI and overall OSCE scores were observed (see Sections 0 and 4.6 of this chapter). A hierarchical (blockwise entry) multiple regression was therefore conducted to examine the extent to which the independent variables were predictive of overall OSCE scores. Given gender differences in attachment, EI and OSCE scores observed in Sections 4.3 and 4.4 of this chapter, and that EI is thought to increase with age (Mayer and Salovey, 1997), gender and age were included as control variables at the first step, followed by attachment avoidance and attachment anxiety at step two. Total EI was finally added at step three (displayed in Table 24, overleaf).

Table 24

Hierarchical (Blockwise Entry) Multiple Regression: Study 1

Model	Predictor Variable	Dependent Variable: Overall OSCE score					
		Unstandardised Coefficients		Standardised Coefficient		Model Summary	
		B	Std. Error B	β	T	R^2 (change in R^2)	F (d.f.)
Step 1	Constant	62.97	2.58		24.37***	.03	2.47 (2, 166)
	Gender	1.28	.59	.17	2.17**		
	Age	.05	.105	.04	.50		
Step 2	Constant	65.42	2.83		23.10***	.05 (.02)	2.33 (4, 164)
	Gender	1.27	.57	.17	2.21**		
	Age	.05	.10	.04	.50		
	Attachment avoidance	-.09	.05	-.13	-1.74*		

Table 24 Continued

Model	Predictor Variable	Unstandardised Coefficients		Standardised Coefficient		Model Summary	
		Dependent Variable: Overall OSCE score					
		B	**Std. Error B**	**β**	**T**	**R^2 (change in R^2)**	**F (d.f.)**
Step 2	Attachment anxiety	-.05	.05	-.07	-.92		
Step 3	Constant	62.85	3.15		19.98***	.07 (.02)	2.56 (5, 163)
	Gender	1.03	.60	.14	1.72		
	Age	.03	.10	.02	.27		
	Attachment avoidance	-.06	.05	-.11	-1.36		
	Attachment anxiety	-.07	.05	-.01	-.18		
	Total EI	.04	.02	.20	2.46**		

* = significant at $p <.05$,   ** = significant at $p <.01$,   *** = significant at $p <.001$

As can be seen in Table 24, in step one, only gender made a significant contribution to the model and was a significant predictor of overall OSCE score (β = .17, p = .00). The model explained a small and non-significant proportion of the variance in overall OSCE score (R^2 = .03, $F(2, 166)$ = 2.41, p = .08). In step two, addition of attachment avoidance and attachment anxiety resulted in both gender and attachment avoidance making significant contributions to the model and significantly predicting OSCE scores (β = .17, p = .00 and β = -.13, p = .04 respectively). The model explained a larger and significant proportion of the variance in overall OSCE score (R^2 = .05, $F(4, 164)$ = 2.33, p = .02). Inclusion of EI rendered both gender and attachment avoidance non-significant predictors of overall OSCE score; the only significant predictor was EI (β = .20, p = .00). The model explained a larger and significant proportion of the variance in overall OSCE score (R^2 = .07, $F(5, 163)$ = 2.56, p = .02).

4.6.7.2   Structural Equation Model

Chapters 2 and 3 discussed literature relating both attachment and EI on PPC. Chapter 2 also highlighted the developmental nature of EI, conditional on an individual's attachment (Kafetsios, 2004). As a result of this literature, a theoretical model of PPC was developed, which specified that medical students' and doctors' attachment influences their EI, which in turn influences their PPC. Attachment was hypothesised to indirectly influence PPC through EI, rather than be a direct influencer. Figure 7 gives a graphic depiction of the hypothesised model.

Figure 7

Hypothesised Model of the Relationships between Attachment, Emotional Intelligence and Objective Structured Clinical Examination Scores
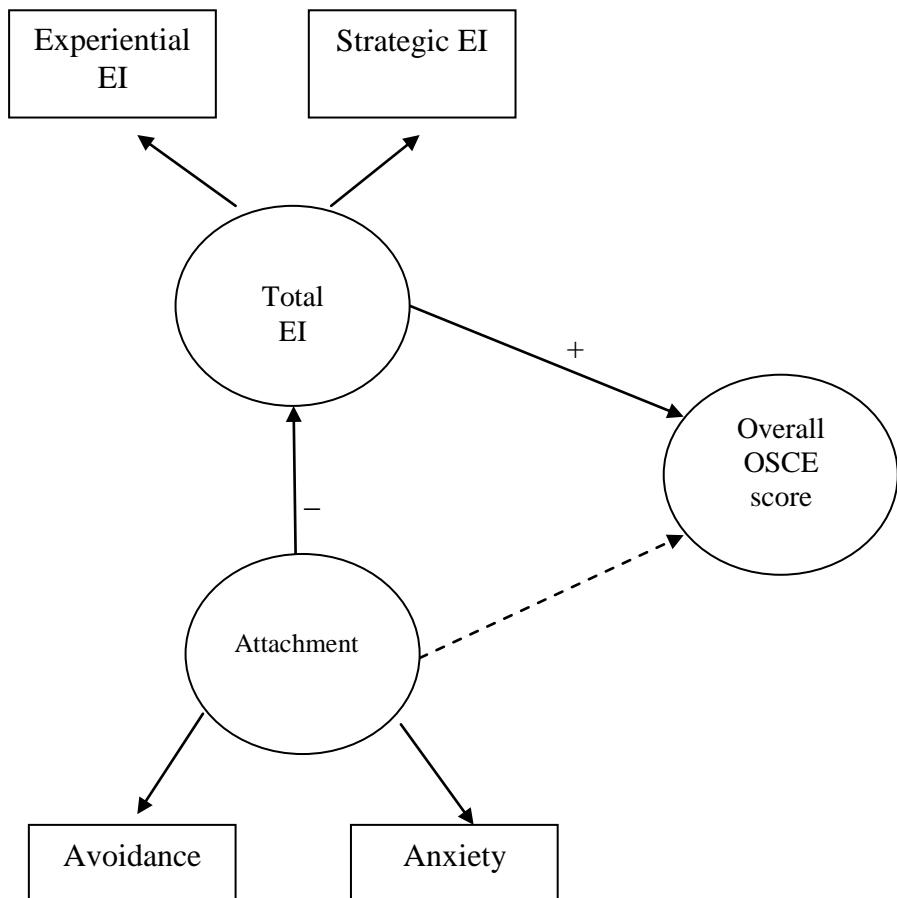
However, attachment anxiety was not related to either attachment avoidance or overall OSCE score ($r = .09$ and -.06 respectively), and did not significantly predict overall OSCE score (Table 24). This indicated that the hypothesised model above was unlikely to be representative of the processes occurring in the current study population. The literature was re-consulted with these data in mind. Adult attachment theory postulates that the avoidance dimension describes an individual's desire to form and maintain (close) relationships with others (Fraley, 2010) and is not necessarily related to attachment anxiety. The attachment avoidance dimension was therefore thought to be theoretically more applicable to the study of individual differences in PPC than the anxiety dimension, which is characterised by a fear of interpersonal rejection or abandonment (Fraley, 2010). To confirm the decision not to include attachment anxiety in the hypothesised model, the hypothetical model

displayed in Figure 7 was tested using SEM and failed to converge. Subsequently, a modification was implemented based on the theoretical considerations above (Figure 8).

Figure 8

Modified Model of the Relationships between Attachment Avoidance, Emotional Intelligence and Objective Structured Clinical Examination Scores: Study 1
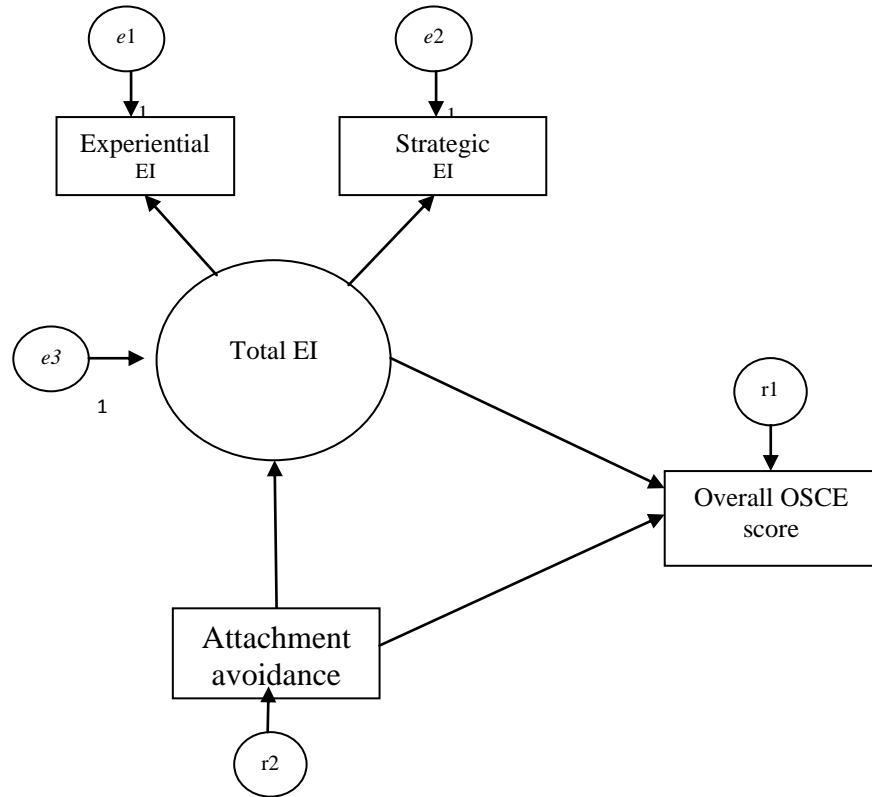
Note: e = measurement error in observed variables; r = residual error

Minimisation was successful; Figure 9 displays the final model, including standardised path coefficients for each path.

Figure 9

Final Model of the Relationships between Attachment Avoidance, Emotional Intelligence and Objective Structured Clinical Examination Scores: Study 1
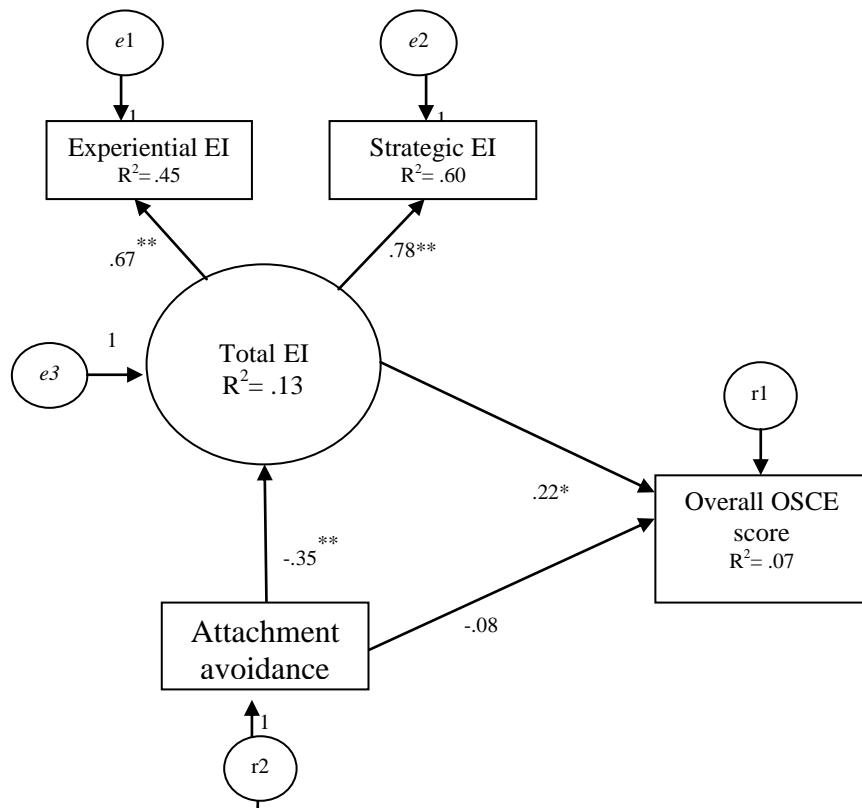
* = significant at $p < .05$, ** = significant at $p < .01$, *** = significant at $p < .001$

Note: e = measurement error in observed variables; r = residual error; R^2 = coefficient of determination

The data were an acceptable fit to the model (χ^2 (1, 166) = .56, p = .45; CMIN/ d.f. = .56, RMSEA = .00 (90% confidence boundary .00 to .18), CFI = 1.00). The relationships observed in Section 4.5.1 between attachment avoidance and EI remained significant, with attachment avoidance accounting for 13% of the variance in students' EI. EI had a direct and significant effect on OSCE scores, significantly predicting 7% of the variability in students' OSCE scores. No direct effects of attachment avoidance on OSCE scores were observed. Bootstrap estimates and percentiles for direct effects are presented in Table 25, overleaf.

Table 25

Direct Effects in the Final Structural Equation Model: Study 1

Regression path	Mean regression weight estimate	Mean bootstrapped regression weight estimate	SE of bootstrapped regression weight estimates	Bias	Bootstrap percentile (95) with bias correction	
					Lower bounds	Upper bounds
EI ← avoidance	-.71**	-.71**	.00	.00	-1.15	-.30
Overall OSCE score ← avoidance	-.07	-.07	.00	.00	-.20	.07
Overall OSCE score ← EI	.10*	.10*	.00	.00	.01	.19
Strategic EI ← EI	1.00	.1.00	.00	.01	1.00	1.00
Experiential EI ← EI	1.13***	1.13***	.01	.01	.69	2.29

 * = significant at *p* <.05,   ** = significant at *p* <.01,   *** = significant at *p* <.001

Note: SE = standard error

For the significant parameters in the final SEM (i.e. all of the parameters with the exception of the attachment avoidance to EI parameter), zero was not within any of the estimated regression weights' confidence intervals, indicating that the modelling of the parameters was justified given that the estimates were significantly different from zero. Both the standard error of the bootstrapped standard error estimates and the bias were low, indicating that the regression weights produced by the model can be interpreted without fear that departures of multivariate normality from the small sample biased the calculation of the parameters. No modification indices[63] were estimated to make a significant contribution to the model (i.e. a modification index value of > 4), therefore no subsequent modifications were made to the model and the model was treated as final. Section 1.1 of Appendix 6 contains further details of model fit and regression weights.

4.7   Summary of the Results

This study demonstrated that first-year medical students' attachment styles and EI were related to their PPC; when considered in isolation, students' OSCE scores were negatively correlated with their attachment avoidance and positively correlated with their EI. Furthermore, attachment was negatively correlated with EI. When these relationships were modelled using SEM, only EI significantly predicted overall OSCE scores, accounting for 7% of the variance; attachment avoidance indirectly influenced OSCE scores by predicting 13% of the variance in students' EI. No relationship was found between first-year medical students' attachment or EI and their responses to simulated patients cues of emotion, as quantified using the VR-CoDES.

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[63] The modification index is a lower bound estimate of the expected chi-square decrease that would result when a particular parameter is left unconstrained.

5 Discussion

5.1 Introduction

This section discusses the implications of the results of Study 1. The descriptive characteristics of the sample are first discussed with reference to published literature to provide a context for interpreting the results of the research questions and hypotheses. Each research question and hypothesis is then discussed in turn. The overall conclusions of Study 1 and its associated strengths and limitations are then briefly summarised in order to provide a rationale for Study 2.

5.2 Context of Descriptive Characteristics

This is the first known study to assess attachment styles in first-year medical students dimensionally using the ECR:SF; participants displayed similar patterns of attachment to other medical student samples (Ciechanowski et al., 2004, Hick, 2009, Atherton et al., 2009) and the general population (Mickelson et al., 1997), with the distribution of attachment avoidance and attachment anxiety scores indicating a range of underlying comfort with close relationships. The observed gender differences in attachment anxiety were congruent with the results of a large meta-analysis (Del Giudice, 2011), indicating that the spread of attachment styles in the current study compares favourably with other published research. However, students' mean total EI score ($M = 84.00$, $SD = 17.46$) fell below that of other empirical studies and that of the normative mean proposed by the test publishers of 100, falling into the 'consider improvement' category of interpretation. This indicates that participants had sufficiently low levels of EI as to recommend development of the emotional competencies underpinning the ability based model (Mayer and Salovey, 1997). Participants' EI was also lower than expected when compared with other medical students of a similar age, developmental level and level of cognitive ability (Todres et al., 2010, Brannick et al., 2009). The gender differences observed in the cohort support those observed by others (Mayer et al., 2002, Carrothers et al., 2000, Todres et al., 2010, Austin et al., 2005, Austin et al., 2007). They indicate a need for males to develop the emotional competencies underpinning the ability based model, particularly those involved in managing emotions (Branch 4) in order to reach the same standard of EI as their female counterparts.

Negative correlations were found between attachment avoidance and all scales of EI, irrespective of gender. These data support previous literature (Kafetsios, 2004) and indicate that an individual's attachment avoidance is negatively associated with their ability to perceive emotions, use emotions to facilitate thinking and understand and manage emotions. Whilst the strength of the correlations was weak (Field, 2009), the strongest negative relationships observed were between attachment avoidance and Branch 4. This indicates that attachment avoidance may particularly influence an individual's ability to develop higher level, molar skills more so than their ability to perceive and recognise emotions (described by Mayer and Salovey (1997) as "*more basic psychological processes*"). Negative correlations were also found between attachment anxiety and EI, indicating that high attachment anxiety, characterised by habitual preoccupation and over involvement in close relationships combined with a fear of abandonment, is associated with a decreased ability to use emotions to facilitate thinking and subsequent behaviour. The weaker correlations reported between attachment anxiety and EI suggest that attachment anxiety may relate more to the lower level molecular skills involved in understanding and applying emotional information rather than the to higher level skills involved in perceiving emotional information and integrating it into thought.

In this study, students' PPC was quantified in two ways: the LUCAS was used to assess global PPC competence across the four OSCE stations, whereas the VR-CoDES was used to micro-analyse students' responses to simulated patients' cues in one station. Students' proportions of 'provide space'/'affect focused' responses were not related to their overall OSCE scores, indicating that, as hypothesised in the Introduction to Part 2, each dependent variable quantified different aspects of medical students' PPC. Proportions of 'provide space'/'affect focused' responses relate to the degree to which students identified simulated patients' cues and facilitated their further discussion. Raters using the VR-CoDES are trained to consider the *appropriateness* of behaviours, as a behaviour can only be considered a skill when it is appropriately displayed. In this way, medical students' responses were interpreted in light of their accompanying non-verbal behaviours and factors such as tone of voice. The LUCAS considered students' abilities to interact with simulated patients, by considering 10 discrete behaviours. Whilst some behaviours (particularly empathy and responsiveness and appropriateness of

students' questions or prompts) may be synonymous with 'providing space' for further discussion of simulated patients' cues, most are not and therefore the LUCAS may provide a more comprehensive overview of students' PPC. It is therefore perhaps unsurprising that weak relationships were found between the LUCAS and the VR-CoDES in this study, given that the LUCAS may provides a comprehensive overview of communication *behaviours* than the VR-CoDES, which provides an in-depth analysis of a specific communicative *skill*: the ability to identify and respond to emotion. The lack of overlap between the measures suggests their independence and indicates that together they may measure a range of both PPC *skills* and *behaviours*.

Participants scored highly on the OSCE overall (mean score of 91.78%), and their marks displayed little variance. The high mean scores may represent the use of the LUCAS to assess PPC; the LUCAS was designed to assist examiners in identification of problematic rather than excellent communicators and therefore the authors of the LUCAS acknowledge that there may be a ceiling effect to students' scores (Huntley et al., 2012). As the students were in their first year, allowances were made for their relative lack of PPC skills' training and clinical experience. For example, a student could score one point ('borderline') by merely displaying behaviours such as clarification and summarising, so long as the patient's engagement with the consultation was not more than moderately disrupted. Clearly, this mechanism of assessment reflects students' stage of training; behaviours that disrupted patients' engagement with the consultation, even marginally, would be penalised in later year assessments. Use of the LUCAS to assess students' PPC reflects current practice at the University of Liverpool, but the resulting data should be interpreted in light of these wider considerations.

In the videoed station, participants 'provided space' for further discussion of simulated patients' cues of emotion in 66.70% of occasions, with 'content exploration' and 'affect exploration' responses being the most frequently adopted (34.02% and 7.97% of all responses respectively). These findings compare favourably with other published research applying the VR-CoDES to undergraduate medical students (Atherton et al., 2009, Hick, 2009). Encouragingly, only 6.53% of medical students' responses in the current study ignored cues. However, changes in

responses to cues may occur with progression through medical school as a function of training and increased medical knowledge and patient contact. No differences were found in proportions of 'provide space' or 'affect focused' responses by gender, supporting Hick (2009) but contrary to findings of Roter and Hall (2004) that females doctors engage in more psychosocial talk with their patients than males. It is possible that gender differences in communication styles were evident (as supported by females' higher mean overall OSCE scores) but that increased psychosocial talk by females may be antecedent to patients' cues rather than be evident in their responses. This may account for the lack of gender differences in proportions of 'provide space' and 'affect focused' responses. Medical students provided simulated patients with information in response to cues on 4.27% of occasions; the most frequent 'reduce space' responses to cues (evident in 20.65% of all cue responses) were those that demonstrated awareness of cues but then which 'switched' their frame of reference to another individual, setting or location. The majority of these switching behaviours referred the patient's cue back to the doctor, for example by saying "*I'm only a first-year medical students so I'm unable to tell you what it might be, but I'll be sure to tell the doctor that you are concerned about your tiredness. Is there anything else you'd like me to tell the doctor?*" (Participant 109). However, it is important to bear in mind that the frequency of students' 'switching' responses may be a function of their early level of training, and thus such data should be interpreted accordingly.

5.3   **Overall Summary of Variables**

The data discussed so far provide a context for interpreting the results of the analyses conducted to address the hypotheses and research questions of this study. The next section discusses the findings of these analyses with relation to the aim of the study: to explore the influence of first-year medical students' attachment styles and EI on their PPC with simulated patients in an OSCE setting.

5.4   **Discussion of Hypotheses and Research Questions**

5.4.1   **Hypothesis 1: Medical Students' Attachment Avoidance and Attachment Anxiety will be Negatively Related to their Objective Structured Clinical Examination Scores**

Data partially supported the hypothesis that medical students' attachment styles would be negatively related to their overall OSCE score; significant negative correlations were found between students' overall OSCE scores and their attachment avoidance, suggesting that students' abilities to consistently display PPC behaviours appropriate to their level of training were negatively influenced by their attachment avoidance, albeit weakly (correlation of -.16) (Field, 2009).

Individuals scoring high on attachment avoidance demonstrate difficulty in trusting others, devalue close relationships and tend to avoid intimacy in close relationships (Collins and Feeney, 2000). They also display a tendency to exhibit superficial intervention behaviours to avoid patient conflict and to intervene less intensively with clients, regardless of the clients' needs (Dozier et al., 1994). They are also less able to make psychological inferences about others' behaviours than their counterparts (Berry et al., 2008). Students scoring low on attachment avoidance may therefore have been able to address sensitive topics with simulated patients thoughtfully and appropriately during the OSCE in a manner congruent with examiners' expectations and the patient-centred curriculum advocated to them. Whilst attachment styles were not observed to influence proportions of 'provide space' or 'affect focused' responses (see Section 5.4.2 of this chapter), these finding that attachment avoidance is associated with OSCE scores replicates that of Hick (2009). Hick studied fourth-year medical students in their final PPC OSCE, indicating that the findings are not limited to the population and setting studied in the current study but also apply to students later in their training.

However, contrary to hypothesis 1 and data from Hick (2009), no significant relationships were found between medical students' attachment anxiety and their overall OSCE scores. Consideration of overall OSCE score may have masked the influence of attachment anxiety on PPC; high attachment anxiety is characterised by a habitual preoccupation with, and over-involvement in, close relationships (Collins and Feeney, 2000) and therefore it may be expected to positively correlate with some

items on the LUCAS (such as empathy and responsiveness to simulated patients' emotions), but not others (such as demonstrating an adequate balance of open and closed questions). Examining items at the individual level rather than considering overall OSCE scores may therefore have provided richer data, better suited for analyses addressing the influence of attachment anxiety on PPC. However, minimal variation in students' scores on individual LUCAS items and attempts to minimise Type I errors rendered this analysis approach unfeasible.

The findings of hypothesis 1 regarding attachment avoidance and the consistency of these findings with those from with other published research (Hick, 2009, Berry et al., 2008, Dozier et al., 1994) therefore raise educational implications related to the role of attachment theory in PPC skills teaching (discussed in Chapter 8). However, the lack of significant associations between medical students' attachment anxiety and their overall OSCE scores clearly requires further validation, particularly given the contradictory findings of Hick (2009).

5.4.2 Hypotheses 2 and 3: Medical Students' Attachment Avoidance and Attachment Anxiety will be Negatively Related to their Proportion of 'Provide Space' and Proportion of 'Affect Focused' Responses to Simulated Patients' Cues of Emotion

It was hypothesised that medical students' attachment styles would be negatively related to their proportions of 'provide space' responses, given that individuals low on attachment avoidance and attachment anxiety are able to retrieve a positive IWM of interpersonal interactions and experiences (Jones, 2005). Through this mechanism, it was hypothesised that these individuals may display more 'responsive' communicative behaviours than their counterparts, particularly when expressing or dealing with difficult emotions (Jones, 2005, Trusty et al., 2005, Anders and Tucker, 2000). No relationships were observed between medical students' attachment styles and their proportions of 'provide space' responses, replicating the findings of previous research applying the VR-CoDES to a medical student population (Hick, 2009, Atherton et al., 2009). The triangulation of these data indicates the robustness of the findings. However, 'providing space' for further discussion of cues in 100% of instances may reflect a provider who superficially deals with each presenting cue but does not explore it in depth and such behaviour,

therefore, may not be reflective of a tailored and individual approach to care (Arborelius and Österberg, 1995, Zimmermann et al., 2003, Del Piccolo et al., 2000, Goldberg et al., 1993, Rimondini et al., 2006). It was also possible for students to have a high proportion of 'provide space' responses but not address the emotional content of patients' cues. Participants 'provided space' in 66.70% of occasions, but the vast majority (34.02%) of responses fell into the 'content exploration' category, indicating that students requested more information about the cue's factual content than its affective content. For example, compare the following responses to the cue of "*I have been really worried about the medication that I am taking*": "*What is it that is worrying you about the medication?*" ('affect exploration') and "*What medication are you taking?*" ('content exploration'). It is clear that the 'affect exploration' response allows the simulated patient to talk in more detail about the nature of their worry, whereas the 'content exploration' response effectively shuts down affective discourse but allows the simulated patient to disclose details regarding the cue's factual element. Hence, using proportion of 'provide space' responses as an outcome measure may have masked the influence of differences in attachment style; attachment avoidance or anxiety may have influenced the likelihood of utilising 'content-' or 'affect-focused' responses.

To this end, proportions of 'affect focused' responses were also considered with relation to medical students' attachment avoidance and attachment anxiety. However, despite this, no relationships were observed between medical students' attachment styles and their proportion of 'affect focused' responses either. This allowed for rejection of the null hypothesises and the conclusion was drawn that attachment styles do not influence participants' responding to patients' cues in an OSCE setting when measured using the VR-CoDES.

5.4.3 Research Question 1: What is the Relationship between Medical Students' EI and their Patient-Provider Communication?

It was theoretically hypothesised that medical students' EI would be positively related to their overall OSCE scores, given the literature outlined in Chapter 2. The current study found support for this theoretical hypothesis: positive relationships were observed between medical students' overall OSCE scores and their EI, specifically their abilities to use emotional information to facilitate their

thought processes (Branch 2), understand emotional information (Branch 3) and manage their own and others' emotions (Branch 4).

Salovey and Mayer (1990) view EI as consisting of discrete emotional abilities (Branches) arranged from lower, more molecular skills to higher, molar activities. The lower Branches are thought to impact on social interactions indirectly, by providing a mechanism for interpretation of social cues (Lopes et al., 2005). The lower Branches are also thought to guide emotional self-regulation and behaviour (Lopes et al., 2005). Data from the current study indicate that participants who were better able to understand emotions and use emotions to facilitate thought were viewed by trained examiners as more competent communicators than their counterparts on a range of dimensions. These include the ability to display appropriate empathy when communicating with simulated patients, to behave in a manner congruent with level of training and to use an appropriate balance of questioning styles. In addition, these individuals were better able to perform these behaviours consistently in a high-pressure, time-limited and assessed OSCE environment. Understanding emotional dynamics (i.e. high scores on the lower Branches) may therefore help students to anticipate simulated patients' emotional reactions within the OSCE stations and subsequently apply strategies to ensure effective PPC (Lopes et al., 2005), hence indirectly resulting in increased overall OSCE scores.

However, Branch 4 has been highlighted as the most important component of EI in interpersonal communication due to its role in "*modulating emotional experience to attain desired affective states and adaptive outcomes*" (Lopes et al., 2005). During the OSCE, medical students were required to translate and apply learned PPC knowledge to each individual patient encounter in order to fulfil the requirements of the OSCE checklist and to behave in a manner congruent with simulated patients' and examiners' expectations. Emotional management and regulation strategies may assist in this process, as they aid individuals to flexibly focus their attention (Lopes et al., 2005), apply effective social interaction strategies (Furr and Funder, 1998, Langston and Cantor, 1989), make effective decisions when under stress (Lopes et al., 2005) and manage their stress levels appropriately and effectively (Lopes et al., 2005). Students better able to manage their own emotions

were rated as more effective communicators across all four OSCE stations than those scoring lower on Branch 4, indicating a relationship between students' emotional regulation abilities and examiners' subsequent positive perceptions of their PPC.

Of note is that participants in the current study had sufficiently low levels of EI in comparison to the general population as to recommend development of the emotional competencies underpinning the ability based model (Mayer and Salovey, 1997) (see Section 5.2 of this chapter). This is a surprising finding given the reported association between EI and both general intelligence and academic performance (Victoroff et al., 2013, Chew et al., 2013, Côté and Miners, 2006, Austin et al., 2005). This is surprising given the relatively narrow and high range of intellectual abilities expected of a medical student cohort and the advocated importance of high EI within medicine (Grewal & Davidson, 2008). It is possible that there may be a minimum level of emotional competence required for effective self-management, after which the impact on PPC is lessened. The relationships observed in this study may therefore not be generalisable to a different cohort with higher levels of EI; further research would be useful to identify whether the notion of a minimum level of EI is applicable to the study of PPC.

5.4.4 Research Questions 2 and 3: What is the Relationship Between Medical Students' EI and their Proportions of both 'Provide Space' and 'Affect Focused' Responses to Simulated Patients' Cues of Emotion?

No relationships were found between medical students' EI and their proportions of 'provide space' or 'affect focused' responses to simulated patients' cues. There may be optimum levels of 'provide space' or 'affect focused' responses to cues, dependent on patients' underlying needs and their feelings towards active participation in the consultation and towards their own care. It is therefore possible that EI is linked to identification and adoption of the most *appropriate* levels of 'provide space' or 'affect focused' responses for the individual patient and their presenting complaint, hence postulating an explanation for the lack of linear associations between EI and proportions of 'provide space' and 'affect focused' responses. Those with high EI may recognise that it is not appropriate solely to 'provide space' for further discussion of emotive cues within a medical consultation and rather provide an appropriate balance between acknowledging and exploring

cues in a way congruent with the patients' needs. Those with lower EI may fall to either extreme of the spectrum.

Whilst this forms one plausible explanation for the lack of observed significant relationships, it also is possible that time period considered was too short or that the students were too inexperienced for their EI to impact on their responses to simulated patients' cues (although see Sections 5.4.1 and 5.4.3 for a discussion of attachment styles and EI relative to OSCE score). The added assessment element of the consultation may also have influenced students' PPC: students were required to display the appropriate range of communicative behaviours in order to be positively viewed by examiners, to fulfil the requirements of the LUCAS and to behave in a professional manner compatible with their position as first-year medical students. Balancing these tasks may have had an influence on students' PPC. For example, the majority of participating students began to *prepare to*, or to *actually* summarise the consultation once they heard a warning bell signalling that they had one minute left of the OSCE station, regardless of the simulated patient's presentation. Furthermore, whilst the OSCE reflects to some extent the time constraints of 'real life' clinical practice, the short duration of each station and the inexperience of the students may have influenced their ability to explore psychosocial cues or elicit the patient's perspective, both of which can be time-consuming. Students may therefore choose to explore these dimensions of PPC in a less time-pressured situation, such as when on clinical placement rather than in an assessed situation (Rouf et al., 2009). The lack of relationships between medical students' EI and their proportions of 'provide space' and 'affect focused' responses may therefore be due to a combination of the artificiality of the OSCE setting, the relative inexperience of the students and the possible reliance on learned behaviours in order to satisfy the OSCE assessment criteria rather than medical students' EI not influencing their abilities to discuss emotive issues with simulated patients.

As this study is the first to apply the four-branch ability-based model of EI (Mayer et al., 2000) to the study of first-year medical students' PPC, it is not possible to compare these findings to those of previously published research. Papers that have directly examined the relationships between medical students' or doctors' EI and outcomes relevant to patient-centred care have focused mainly on patient

satisfaction, with tentative positive relationships reported between doctors' EI and patients' satisfaction with their care (see Chapter 3) (Weng et al., 2008, Weng et al., 2011b, Weng et al., 2011c, Wagner et al., 2002). Future research is clearly needed to replicate and expand these findings, as the mechanism by which EI impacts on PPC is, as yet, unclear. A systematic review of EI and patient-centred care concluded that more research examining the role of EI in healthcare, particularly in patient-centred care provision, is needed (Birks and Watt, 2007). The review highlights the lack of coordination in current research and recommends a more cautious and systematic evaluation of the concepts to be considered (Birks and Watt, 2007). Whilst this research therefore provides baseline data relating medical students' EI to their responses to simulated patients' cues, clearly further research is required, conducted in the manner outlined above.

5.4.5 Research Question 4: What are the Combined Influences of Medical Students' Attachment Styles and EI on their PPC?

Whilst the above findings indicate that medical students' attachment avoidance and total EI scores may separately influence how they perform on their first-year OSCE overall, no interaction could be determined from the analyses conducted. Similarly, the findings do not tell us *how* important attachment avoidance and EI may be in explaining individual student variation in OSCE scores. It was theoretically hypothesised that medical students' attachment styles would directly impact on PPC by influencing their EI, which in turn would influence their PPC directly. This notion was explored using regression models and SEM. After controlling for gender and age, attachment avoidance significantly predicted overall OSCE scores when entered into a stepwise regression model. However, when EI was added as a final step, it rendered the influence of attachment avoidance insignificant, and total EI became the only significant predictor of overall OSCE scores.

When a hypothetical model of attachment avoidance, EI and overall OSCE scores was investigated with SEM, the relationships observed between attachment avoidance and EI remained significant, with attachment avoidance accounting for 13% of the variance in students' EI. However, the route between attachment avoidance and overall OSCE scores became insignificant. This indicates that medical students' attachment avoidance had no direct effect on their overall OSCE scores

when their EI was also considered. On its own, EI significantly predicted 7% of the variability in OSCE scores, indicating that students with higher levels of EI were viewed in a more positive light by examiners. Attachment avoidance influenced this process through its relationship with EI, but did not significantly impact on students' OSCE scores when considered in conjunction with their EI. In simple terms, the negative influence of medical students' attachment avoidance on their PPC was 'overridden' or mediated by the positive influence of their EI.

No published research was available at the time of writing which reported on the interplay between attachment avoidance, EI and medical students' PPC, making the current study unique in its approach. However, the paucity of published data made comparison with other studies difficult. Data indicate the mediating effect of EI on the relationship between individuals 'attachment styles and their interpersonal behaviours, such as brooding/maladaptive rumination (Lanciano et al., 2012) and capacities to manage and control emotions in challenging situations (Gunning et al., 2011). These data suggest that developmental levels of emotional self-regulation and management (EI), whilst influenced by attachment style, may mediate the (negative) effect of attachment avoidance on cognitive and behavioural processes. Whilst both attachment avoidance and EI comprise cognitive and affective components and are both influenced by previous experiences of interpersonal situations, attachment acts unconsciously to guide social behaviour whereas EI is a more conscious, cognitive process and can be more easily shaped and developed (Mayer et al., 2002). As the current research is the first investigation into the combined influence of attachment avoidance and EI on PPC, it is not possible to generalise these findings to other PPC settings. However, the theoretical underpinnings of this research and the mediating effect of EI on the relationships between attachment styles and interpersonal behaviours (Lanciano et al., 2012, Gunning et al., 2011) suggest that the mediating effect of EI is not limited to examined and primed simulated settings such as the OSCE, in which individuals are aware of the nature and function of the behaviours expected of them. However, clearly further research is required to assess the generalisability and transferability of these findings.

6   Methodological Considerations, Strengths and Possible Limitations

This section discusses the strengths and possible limitations unique to the current study. A discussion of the limitations and strengths common to all three empirical studies is presented in Chapter 7, along with overall methodological considerations. These are therefore not discussed in detail in this section to avoid repetition.

This study is the first to consider the influence of first-year medical students' attachment styles and EI on their PPC and therefore its first strength is in its provision of baseline data. Of particular commendation is the SEM showing the indirect and direct relationships between medical students' attachment avoidance, EI and PPC. Whilst this model clearly needs further application to different populations and settings, the findings provide a useful vantage point on which to base subsequent research.

However, as with every study using a specific population, a response rate of less than 100% limits the generalisability of the findings and increases the risk that results may be specific to the participant cohort studied rather than the whole sample population. The response rate in the current study can be viewed with satisfaction, particularly given the length of the MSCEIT; however the sample may not be representative of the entire cohort in terms of attachment styles, EI and PPC, despite participants' and non-participants' similarities in demographic characteristics.

The timing of questionnaire distribution may also have influenced the findings; residual levels of stress post-OSCE may have influenced medical students' responses. Whilst the MSCEIT is an ability-based measure and is therefore thought to overlap with transient emotional states less than mixed or trait models (cf Chapter 2), weak negative correlations between MSCEIT total score and depression and anxiety have been reported (Brackett and Salovey, 2006). Participants' low MSCEIT total scores may be reflective of their stress levels at the time of administration. However, the author was approved by the test publisher to administer the MSCEIT to participants post-examination as students' stress levels were not thought to be sufficient to bias the results.

The limitations of the OSCE used in the current study must also be considered. Whilst there are a number of strengths associated with assessing PPC in a standardised examination context, its external validity, and the generalisability of the findings to non-assessed contexts or real clinical settings are limited. Participants were not assessed on their clinical knowledge; clinical and PPC skills are integrated only in later year examinations. It is possible that students may behave differently when required to elicit and recall clinical information from patients (Epstein et al., 2005), therefore supplementary research is needed to consider whether the findings of this exploratory study are replicated when students are examined on their abilities to elicit clinical information from simulated patients as well on as the effectiveness of their PPC (Silverman et al., 2005).

7   Conclusions and Rationale for Study 2

Neither medical students' attachment styles nor their EI were related to their responses to simulated patients' cues of emotion. Whilst significant relationships were observed between medical students' overall OSCE scores and both their attachment avoidance and EI, when these relationships were modelled using SEM, attachment avoidance was found to act indirectly by negatively influencing EI. EI was the only direct correlate of PPC, accounting for a small proportion in the variance in students' OSCE scores. This study can therefore conclude that medical students' attachment and EI are related to their PPC with simulated patients in an OSCE setting, with EI mediating the negative influence of attachment avoidance on OSCE scores.

These findings are important in isolation, given that progression through to the next year of medical school is dependent on students passing the first-year PPC OSCE. If medical students' attachment styles and EI influence their PPC OSCE performance, then this has potential educational implications for medical curricula (discussed further in Chapter 8). However, more research is needed to examine the generalisability of the findings to other populations and settings before clinical and educational implications can be proposed. To this end, Chapter 5 reports the second of the three empirical studies, which addresses some of the limitations of Study 1.

Chapter 5: Study 2 - Exploring the Influence of Second Year Medical Students' Attachment Styles and Emotional Intelligence on their Patient-Provider Communication

1 Introduction

Chapter 4 presented the findings of the first of the three empirical studies reported within this thesis. Whilst its results provided baseline data regarding the influence of first-year medical students' attachment styles and EI on their PPC, an important limitation of the study related to how PPC was assessed; students were not expected to elicit clinical information from the simulated patient, thus the interactions studied were not representative of 'real-life' clinical practice (Silverman et al., 2005).

This chapter discusses the methodology, results and implications relating to Study 2. Study 2 addresses this limitation by studying the same population 12 months later, again consulting in an assessed OSCE situation. Following up the student cohort into their second year has two important implications. First, and perhaps most importantly, students in their second year at the University of Liverpool are marked on their ability to elicit clinical information from simulated patients in addition to demonstrating effective PPC, and thus students' second-year OSCE interactions are more in line with those of an 'effective' medical consultation in the real-life clinical milieu (Silverman et al., 2005). The findings of Studies 1 and 2, when considered *together*, may therefore have greater clinical and educational implications than the results of Study 1 in isolation.

Second, Study 2 provides longitudinal data related to how medical students' attachment styles and EI change over the course of their first two years of undergraduate medical education. This is pertinent given that literature indicates the stability of attachment over time (Del Giudice, 2011), but suggests a decrease in students' EI over the course of their medical education (Stratton et al., 2008). Given the findings of Study 1, it can be hypothesised that changes in students' EI may subsequently influence their PPC. This may subsequently influence the educational implications that can be proposed based on the findings of Study 1. For example, if students' EI decreases from Study 1 to Study 2, should educators consider

implementing educational interventions to improve students' EI during this period? Investigating this notion in Study 2 therefore has *educational* relevance[64].

2 Aim

To further the findings of Study 1 by exploring the influence of second-year medical students' attachment styles and EI on their PPC with simulated patients in a more 'demanding'[65] OSCE setting.

3 Methods

3.1 Ethical Approval

Ethical approval for this study was granted by the University of Liverpool's School of Medical Education Research Ethics Committee prior to recruiting participants (see Section 2.1 of Appendix 1).

3.2 Variables

The same independent[66] and dependent variables[67] were considered as in Study 1 (Chapter 4) to maximise comparability of the two studies.

3.3 Hypotheses

The following research questions and directional hypotheses were explored, based on the findings of Study 1 and the empirical literature outlined in Chapters 2 and 3.

1. Research question 1: Are there still no relationships between medical students' attachment avoidance/anxiety and either their proportions of 'provide space' responses or their proportions of 'affect focused' responses when data from a more 'demanding' OSCE are considered?

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[64] Note: the purpose of Study 2 was *not* to examine whether attachment styles and EI were associated with changes in students' PPC from Study 1 to Study 2

[65] More 'demanding' OSCE setting is a term used to describe a consultation between student and simulated patient in which the student is required to elicit clinical information from the patient as well as demonstrate effective PPC; thus the consultation is reflective of a consultation in the clinical milieu

[66] Medical students' attachment anxiety and attachment avoidance, measured using the ECR:SF, and their EI, measured using the MSCEIT

[67] Medical students' OSCE scores, measured using the modified LUCAS and proportion of 'provide space' responses and proportion of 'affect focused' responses, quantified using the VR-CoDES

2. Research question 2: Are there still no relationships between medical students' EI and either their proportions of 'provide space' responses or their proportions of 'affect focused' responses when data from a more 'demanding' OSCE are considered?

3. Hypothesis 3: Medical students' attachment avoidance/anxiety will be negatively related to their OSCE scores.

4. Hypothesis 4: Medical students' EI will be positively related to their OSCE scores.

5. Hypothesis 5: The model of PPC developed in Study 1 will be a 'good fit' to data collected from the current study.

3.4   Participants

Of the sample of 358 medical students invited to participate in Study 1, 17 terminated their studies or did not progress to second year, whilst 41 new students joined the course (25 graduate entry students and 16 re-sit students). This resulted in a sample of 382 medical students entering their second year of medical school at the University of Liverpool in the academic year 2010 – 2011. All of these students were invited to participate. The male to female ratio was 46.47% to 53.53%. Student ages ranged from 18 to 36 years old, with a mean age of 19.62 years ($SD = 2.32$). The majority of participants (90.61%) were aged 18, 19 or 20 years old. There were no exclusion criteria for the study.

3.4.1   Extent of Students' Communication Skills' Teaching

During the second year of their training, students received a six-week formal module, whose explicit learning objectives were to enable students to develop skills in recognising and responding to patients showing emotional distress in emotionally sensitive clinical settings. The module encompassed six hours of didactic teaching, facilitated by clinicians and staff from different disciplines. To reinforce prior clinical and PPC skills' knowledge, students also completed a six-week General Practice rotation and spent two days per week undertaking medicine and surgery rotations throughout their second year.

Students subsequently completed a 32-station OSCE. Students' PPC skills were specifically assessed in three 10-minute stations during this OSCE. Each PPC station was designed to assess a slightly different aspect of PPC. Two stations were history-taking stations, in which students were required to elicit information from simulated patients regarding their presenting complaint(s). One was a composite station of both history-taking and information-giving, in which students were required to take a history from simulated patients and then provide simulated patients with tailored health information. As in Study 1, students rotated through each station in turn and were examined in each using a structured checklist (see Section 3.5 of this chapter for details). In addition, students were formally assessed on their PPC competence in the form of documented and assessed logbook entries detailing experiences of history-taking and PPC skills with real patients whilst on placement; these assessments were not considered as outcome measures in the current study.

3.5 Procedure for Data Collection

Potential participants were sent an email one month before their summative OSCE with information about the study and were invited to ask questions by return email about participation (see Section 2.1 of Appendix 5). An announcement and the information sheet were also put up on the University of Liverpool's online information portal one month prior to the summative OSCE.

As in Study 1, the summative OSCE took place over 7 days, with 50 students examined on each day. The same examination and recruitment procedure was carried out as in Study 1 (see Section 3.5 of Chapter 4), including pre-OSCE briefings, collection of informed written consent (see Section 2 of Appendix 4) and completion of the questionnaires in the quarantine period.

Students completed each station in turn. An examiner observed and marked each student's performance in each of the three PPC stations using modified versions of the LUCAS (Huntley et al., 2012) (see Section 3.6.1 of this chapter). In each PPC station, students were required to integrate both clinical and PPC skills and were marked on their abilities to demonstrate both. For the purposes of the study, all students were videoed completing one 10-minute PPC OSCE station, in which they were required to conduct an initial consultation with a simulated patient presenting with symptoms of a gastro-intestinal bleed (see Section 1.2 of Appendix 5). This

station was chosen as it was optimised for the simulated patients to display hints or cues to negative emotion. The camera was positioned to only capture the student. The remaining stations were not videoed (although see Section 1.3 of Appendix 5 for station scenarios). The same ethical procedures were followed as in Study 1 (see Section 3.5 of Chapter 4); non-completion of the consent form or questionnaires was taken as non-consent, therefore students did not need to opt out of the study.

3.6 Measures

The same measures were employed in this study as in Study 1. The measures are outlined in detail in Section 3.6 of Chapter 4 and therefore will not be discussed further in this chapter. The OSCE differed slightly from that of Study 1 in terms of focus, length and scoring, and will therefore be briefly summarised below.

3.6.1 Scoring of the Objective Structured Clinical Examination

Modified versions of the LUCAS used in Study 1 (Huntley et al., 2012) were used to assess students' PPC in each of the three PPC stations. In addition to the reasons outlined in Section 3.7.1 of Chapter 4, the OSCE was chosen as a measure of PPC in this study to allow comparability to the findings of Study 1.

The modified LUCAS is the chosen method of PPC skills' assessment for second-year students at the University of Liverpool. Each PPC station's score sheet is tailored to the requirements of that station thus reflecting the increased emphasis on flexibility and tailoring in PPC in students' second year of undergraduate medical education (Silverman et al., 2005). All are based on the 10 items of the LUCAS (see Section 3.7.1 of Chapter 4) but also contain varying numbers of additional items relating to clinical information elicitation and appropriateness of provision of information, where relevant. Examiners rate students' performances during consultations on each item using a Likert scale; numerical scores are computed, summed and transformed into a percentage score for each station. Sections 3, 4 and 5 of Appendix 2 contain copies of the modified LUCAS used in each PPC OSCE station.

No published reliability data exist for the PPC OSCE assessed using the modified LUCAS; Section 3.9.2 of this chapter therefore reports the reliability of the three OSCE stations considered in the current study.

3.7   **Additional Considerations**

As in Study 1, post-examination, consenting students' PPC OSCE scores and demographic data were obtained from the medical school. By consenting, students were aware that they were allowing access to such information. Figure 10 shows the process from recruitment to analysis.

Figure 10

Flow Diagram to Show Study Recruitment and Procedure

| September 2010 | •Students began second year of medical school |

| May 2011 | •Ethical approval for student study obtained from University of Liverpool School of Medicine Research Ethics Committee
•OSCE took place
•One station videotaped, questionnaire data collected (ECR:SF and MSCEIT), OSCE scores collected |

| June 2011 | •Questionnaire data entered into a database
•OSCE videos transferred to electronic files
•Additional data collected |

| June-November2011 | •OSCE videos coded with the VR-CoDES
•Analyses of data completed |

3.8 Data Management and Preparation

The same data management and preparation techniques were employed as in Study 1 (cf Section 3.9 of Chapter 4).

3.9 Data Analysis

3.9.1 Justification for Sample Size

The same statistical methods and therefore same sample size calculations as in Study 1 were used (see Section 3.10.1 of Chapter 4). As in Study 1, a SEM with ten parameters to be estimated was fitted to the data, indicating a minimum of one hundred participants for sufficient power. Whilst the study recruited 296 participants, only data from the 135 participants with a full dataset were fitted to the model; the model was therefore theoretically adequately powered. As with Study 1, given the theoretical uncertainty around adequate power for analysis and the number of participants included in the model, bootstrapping was applied ($n = 500$) to obtain best estimates of model parameters.

3.9.2 Pre-Analyses

The same pre-analysis screening techniques were used as in Study 1, including collapsing cues and concerns together, calculating proportions of 'provide space' and 'affect focused' responses and checking of variables for normality of distribution and homogeneity of variance (see Section 3.9 of Chapter 4). A G-study indicated that the three PPC stations had acceptable reliability (G-coefficient of .69 for the three PPC stations) and supported the rationale to use students' mean PPC OSCE scores as an acceptable measure of their PPC throughout the analyses rather than consider individual station scores.

3.9.3 Descriptive and Exploratory Analyses

Pearson's product-moment correlations, independent sample t-tests, paired sample t-tests, chi-squared tests and graphical plots were used as appropriate for initial data exploration, including examining changes in independent variables between Study 1 and Study 2.

Research questions and hypotheses were examined using Pearson's product-moment correlations. The same SEM as in Study 1 was then fitted to the data to capture the overall model fit. The same procedure to assess the fit of the model was adopted as in Study 1, including bootstrapping ($n = 500$) to obtain best estimates of model parameters (see Section 3.10 of Chapter 4). The model was applied to data from all participants with a full data set; it was not possible to run the model using data from the longitudinal and non-longitudinal participant samples separately and compare their fit due to the small sample sizes in each participant group.

3.9.4 Software Used for Analysis

As with Study 1, all analyses were performed in SPSS 20.0.1 (IBM Corp, 2012b), with the exception of the generalisability analysis, conducted using EduG (Cardinet et al., 2009), and SEM, conducted using AMOS 20.0.1 (IBM Corp, 2012a).

3.9.5 Additional Considerations

The same additional considerations were applied as in Study 1[68]. The results will now be presented.

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[68] Figures reported to two significant figures. Two tailed analyses used throughout. Findings considered statistically significant at the $p < .05$, the $p < .01$ and the $p < .001$ levels. No analyses conducted in individual-level data to minimise chances of Type I errors. Exact p-values presented in text but not tables. Correlation effect sizes reported where appropriate and interpreted using standard conventions: small effect size, $r = .10 - .23$; medium effect size, $r = .24 - .36$; and large effect size, $r \geq .37$

4   Results

4.1   Introduction

First, descriptive data and summary statistics are provided for the sample. Descriptive data are then examined for differences between participating and non-participating students, and between the longitudinal and non-longitudinal participant samples. Section 4.6 then reports analyses addressing the research questions and hypotheses. The section concludes with a summary of overall findings.

4.2   Descriptive Analyses

4.2.1   Response and Attrition Rates

Out of the sample of 382 second-year medical students approached, 296 students (77.49%) participated ('whole participant sample'), of which 123 (41.55%) had also participated in Study 1 by completing either the ECR:SF and/or the MSCEIT, and consenting to analysis of their OSCE data (longitudinal participant sample).

Of the 296 participants in the whole participant sample, 265 (89.53%) completed the ECR:SF and 163 (55.07%) completed the MSCEIT; 132 students (44.59%) completed both the ECR:SF and the MSCEIT. Partially completed ECR:SF questionnaires and MSCEIT questionnaires were returned from 14 (4.73%) and 42 (14.19%) participants respectively; these were excluded from analysis due to the large amount of missing data. There were no missing data in the questionnaires returned from the other participants. Video data were available for 214 of the 296 consenting students (72.30%). The remaining 82 videos were unusable due to either sound error or technical error. Figure 11 shows the process from recruitment to analysis. At the time of writing, no participant had asked for their data to be excluded from the study.

Figure 11

Flow Diagram from Recruitment to Analysis: Study 2

| Sample of second-year medical students invited to participate *n* = 382 | → | All students videoed in one OSCE station *n* = 382 (100%) | → | Students who consented and completed ≥1 questionnaire ('participants') *n* = 296 (77.49%) | → | OSCE video data available for analysis *n* = 214 (72.30%) | → | Video data for consenting students coded and analysed *n* = 214 (72.30%) |

Students who completed the ECR:SF
n = 265 (89.53%)

Students who completed the MSCEIT
n = 163 (55.07%)

Students who completed the ECR:SF only
n = 132 (44.59%)

Students who completed both the MSCEIT and the ECR:SF
n = 132 (44.59%)

Students who completed the MSCEIT only
n = 31 (10.47%)

Students with ECR:SF/MSCEIT and OSCE data from both Study 1 and Study 2
n = 123 (41.55%)

4.2.2 Sample Demographics and Comparison with Non-Participants

The whole participant sample consisted of 133 male students (44.93%) and 163 female students (55.07%), with a mean age of 19.62 years (SD = 2.19). The majority of participants (n = 197, 66.79%) were White British. There were no significant differences between non-participating and participating students in terms of age ($t(294)$= -.42, p = .68) or gender ($\chi^2(1)$ = 1.11, p = .30), indicating that the participant sample in the current study did not significantly differ from the non-participating student sample in terms of the demographic characteristics considered (see Section 3.4 of this chapter for wider discussion of sample demographics).

4.3 Independent Variables

4.3.1 Attachment Styles

Two hundred and sixty five (89.53%) of the 296 participants in the whole participant sample completed the ECR:SF. One hundred and nineteen participants (44.91%) were male and the remaining 146 (55.01%) were female. Participants' attachment anxiety scores were higher than their attachment avoidance scores (M = 19.68, SD = 5.07 and M = 16.71, SD = 5.96 respectively). Figure 12, overleaf, plots the spread of participants' attachment avoidance and attachment anxiety scores.

Figure 12

Attachment Avoidance and Attachment Anxiety Dimension Scores: Study 2
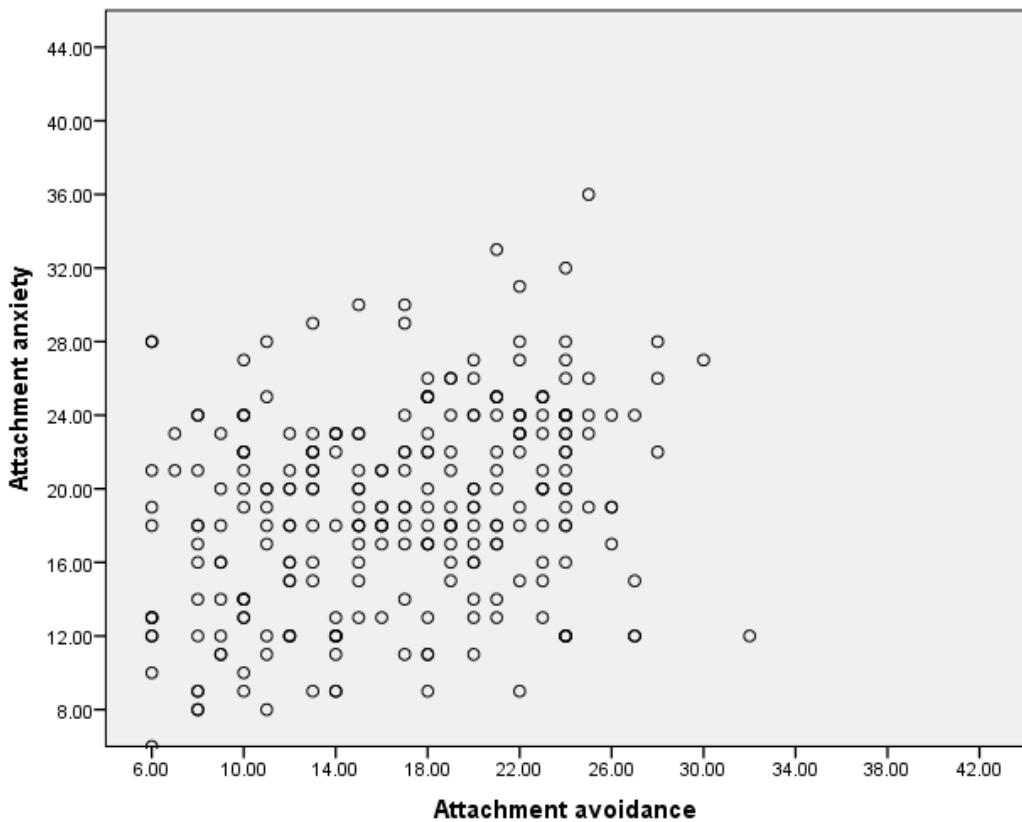
There were no significant differences between males and females on attachment anxiety ($t(263)= 1.84$, $p = .24$) or attachment avoidance ($t(263)= 1.91$, $p = .22$). Similarly, there were no significant differences between longitudinal participants and non-longitudinal participants on attachment anxiety ($t(263) = 1.71$, $p = .27$), or attachment avoidance ($t(263) = 1.02$, $p = .33$).

Paired samples *t*-tests confirmed the stability of longitudinal participants' attachment avoidance between Study 1 and Study 2 (attachment avoidance $M = 16.98$ $SD = 6.03$ in Study 1 and $M = 16.17$, $SD = 5.83$ in Study 2, $t(121)= 1.58$, $p = .12$). Longitudinal participants' attachment anxiety scores were significantly higher in Study 1 than in Study 2 ($M = 20.81$, $SD = 6.51$ in Study 1 and $M = 19.02$, $SD = 5.09$ in Study 2, $t(121)= 2.86$, $p = .01$). Examination of changes by gender revealed that females' scores were driving the significant change in anxiety ($M = 22.08$, $SD = 7.11$ in Study 1 and $M = 19.63$, $SD = 5.29$ in Study 2, $t(72)= 3.328$, $p = .01$).

4.3.2 **Emotional Intelligence**

Of the 296 participants in the whole participant sample, 163 (55.07%) completed the MSCEIT. Seventy two participants (44.17%) were male and the remaining 91 (55.83%) were female. Participants' mean total EI score was 83.73 (*SD* = 16.60). Table 26 shows the mean score, standard deviation and range for MSCEIT scores.

Table 26

Mayer-Salovey-Caruso Emotional Intelligence Scores: Study 2

MSCEIT score	*M*	*SD*	Minimum score	Maximum score
Branch 1 (Perceiving Emotions)	86.48	15.94	31.72	121.01
Branch 2 (Facilitating Thought)	88.53	17.19	35.86	127.72
Branch 3 (Understanding Emotions)	88.20	16.84	53.75	127.03
Branch 4 (Managing Emotions)	84.95	13.17	54.58	115.15
Area 1 (Experiential EI)	84.90	17.70	34.76	120.89
Area 2 (Strategic EI)	86.05	15.52	47.06	125.10
Total EI	83.73	16.60	53.17	127.51

The majority of scores fell into the 'consider improvement' category (see Table 9 on page 99), with participants scoring lowest on Branch 4 (Managing Emotions), Area 1 (Experiential EI) and total EI. Table 27, overleaf, shows the mean score, standard deviation and range for MSCEIT scores split by gender.

Table 27

Mayer-Salovey-Caruso Emotional Intelligence Scores Split by Gender: Study 2

MSCEIT score	Males (*n* = 72) M (SD)	Females (*n* = 91) M (SD)	*T*
Branch 1 (Perceiving Emotions)	83.27 (14.82)	89.04 (16.42)	2.32*
Branch 2 (Facilitating Thought)	82.87 (16.90)	93.01 (16.14)	3.90**
Branch 3 (Understanding Emotions)	85.88 (18.28)	90.03 (15.46)	1.57
Branch 4 (Managing Emotions)	82.14 (13.00)	87.17 (12.96)	2.46*
Area 1 (Experiential EI)	78.80 (17.27)	89.72 (16.60)	4.09**
Area 2 (Strategic EI)	82.93 (15.84)	88.52 (14.89)	2.31*
Total EI	78.98 (16.05)	87.49 (16.15)	3.35**

* = significant at *p* <.05,   ** = significant at *p* <.01,   *** = significant at *p* <.001

As can be seen in Table 27, female participants scored higher than male participants in all Branch, Area and Total scores; these differences were statistically significant for Branch 1, Branch 2, Branch 4, Area 1, Area 2 and total EI.

There were no significant differences in longitudinal participants' and non-longitudinal participants' EI scores. Table 28 displays longitudinal participants' mean Branch, Area and Total EI scores from Study 1 and Study 2.

Table 28

Longitudinal Participants' Emotional Intelligence Scores from Study 1 and Study 2

MSCEIT score	Study 1 M (SD)	Study 2 M (SD)	*T*
Branch 1 (Perceiving Emotions)	91.12 (15.51)	88.50 (15.19)	1.40
Branch 2 (Facilitating Thought)	93.09 (17.54)	90.67 (15.54)	1.27
Branch 3 (Understanding Emotions)	90.78 (17.19)	90.48 (16.41)	.20
Branch 4 (Managing Emotions)	87.28 (17.18)	87.76 (13.67)	.30
Area 1 (Experiential EI)	90.05 (16.42)	87.87 (15.94)	1.32
Area 2 (Strategic EI)	87.34 (16.71)	89.26 (16.05)	1.41
Total EI	86.16 (17.37)	86.60 (16.77)	.39

* = significant at *p* <.05,   ** = significant at *p* <.01,   *** = significant at *p* <.001

Paired samples *t*-tests confirmed the stability of EI between the two studies; no significant differences were found in any Branch, Area or Total EI score.

4.3.2.1   Relationships between Independent Variables

The relationships between attachment and EI (reported in Table 29) were examined for the whole participant sample.

Table 29

Correlations between Attachment and Emotional Intelligence: Study 2

MSCEIT score	Attachment avoidance	Attachment anxiety
Branch 1 (Perceiving Emotions)	-.17	-.01
Branch 2 (Facilitating Thought)	-.23**	-.10
Branch 3 (Understanding Emotions)	-.14	-.02
Branch 4 (Managing Emotions)	-.20*	-.13
Area 1 (Experiential EI)	-.24**	-.06
Area 2 (Strategic EI)	-.20*	-.06
Total EI	-.23**	-.04

* = significant at *p* <.05,   ** = significant at *p* <.01,   *** = significant at *p* <.001

Significant negative correlations between attachment avoidance and Branch 2, Branch 4, Area 1, Area 2 and total EI scores were found. Attachment anxiety was not related to any Branch, Area or total EI score. As in Study 1, attachment avoidance and EI were therefore treated as related variables throughout subsequent analyses.

4.4   Dependent Variables

4.4.1   Objective Structured Clinical Examination Scores

Overall OSCE scores were available for all 296 participants. Participants' scores ranged from 48.94% to 84.53%, with a mean total percentage of 67.10% (*SD* = 6.90). There were no relationship between overall OSCE scores and age (*r* = .08, *p* = .22), nor were there gender differences in participants' scores (*t*(294)= .26, *p* = .71). There were no differences between longitudinal participants' and non-longitudinal participants' overall OSCE scores (*t*(294)= -.28, *p* = .21).

4.4.2   **Verona Coding Definition of Emotional Sequences Data**

Video data from the OSCE were available for 214 participants. One hundred participants (46.73%) were male and the remaining 124 (53.27%) were female.

4.4.2.1   Frequency of Cues

There were 844 utterances of emotion across the 214 coded videos, of which 624 (73.93%) were cues and 220 (26.07%) were concerns[69]. The mean total number of cues per consultation was 3.89 (SD = 2.13) with number of cues ranging from 1 to 16. The median number of cues per interview was 3 (n = 57, 26.27%); 24.78% of students had less than 3 cues per interview, and 48.85% had more than 3 cues per interview. No significant relationship between age and number of cues per minute was observed (r = -.03, p = .66) and no significant differences were found in the number of cues elicited per consultation relative to gender (M = 3.98, SD = 2.20 for female students and M = 3.77, SD = 2.04 for male students, t(212) = .72, p = .47). However, longitudinal participants were presented with significantly more cues per consultation than non-longitudinal participants (M = 3.49, SD = 1.71 for longitudinal participants and M = 4.51, SD = 2.61 for non-longitudinal participants, t(212) = -3.45, p = .00).

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[69] Hereby referred to collectively as 'cues'

4.4.2.2 Responses to Cues

Individual responses to simulated patients' cues are reported in Table 30.

Table 30

Participants' Responses to Simulated Patients' Cues: Study 2

Response category	Response	Frequency (total = 844)	% of total responses	% per category
Non-explicit/ 'Reduce space'	Ignore	88	10.43	27.49
	Shutting down	57	6.75	
	Non-explicit info advise	87	10.31	
Explicit/ 'Reduce space'	Switching	84	9.95	27.48
	Postponing	2	.24	
	Information advise	129	15.28	
	Active blocking	17	2.01	
Non-explicit/ 'Provide space'	Silence	2	.24	10.77
	Back channel	25	2.96	
	Acknowledge	30	3.55	
	Active invitation	17	2.01	
	Implicit empathy	17	2.01	
Explicit/ 'Provide space'	Content acknowledgement	14	1.66	34.24
	Content exploration	120	14.22	
	Affective acknowledgement	65	7.70	
	Affective exploration	63	7.46	
	Affective empathy	27	3.20	

Table 31, overleaf, gives frequencies and percentages of 'provide space' and 'affect focused' responses to cues.

Table 31

Participants' 'Provide Space' and 'Affect Focused' Responses to Simulated Patients' Cues: Study 2

Response Category	Frequency ($N = 844$)	% of total responses (SD)	Range (%)
'Provide space' responses	380	45.01 (30.44)	0.00-100.00
'Affect focused' responses	157	16.01 (21.23)	0.00-100.00

Mean proportion of 'provide space' responses for all participants was 45.01% ($SD = 30.44$), with a range of 0% to 100%. No significant relationship between age and proportion of 'provide space' responses was observed ($r = -.07$, $p = .35$) and no significant differences were found in mean proportions of 'provide space' responses based on participants' gender ($M = 40.22$, $SD = 29.88$ for female students and $M = 42.63$, $SD = 31.19$ for male students, $t(212) = .56$, $p = .57$). There were no significant differences in proportions of 'provide space' responses between longitudinal and non-longitudinal participants $t(212) = .09$, $p = .97$).

Mean proportion of 'affect focused' responses for all participants was 16.01% ($SD = 21.23$), with a range from 0% to 100%. No significant relationship between age and proportion of 'affect focused' responses was observed ($r = -.03$, $p = .2670$ and no significant differences were found in mean proportions of 'affect focused' responses based on participants' gender ($M = 16.47$, $SD = 20.12$ for female students and $M = 15.45$, $SD = 22.61$ for male students, $t(212) = -.35$ $p = .79$). There were no significant differences in proportions of 'affect focused' responses between longitudinal and non-longitudinal participants $t(212) = -.90$, $p = .18$).

4.5 **Relationship between Dependent Variables**

No significant relationships were observed between students' overall OSCE scores and either their proportion of 'provide space' responses ($r = .11$, $p = .12$) or their proportion of 'affect focused' responses ($r = -.06$, $p = .41$). These variables were therefore treated as independent outcome measures throughout subsequent analyses.

4.6   **Main Analyses**

4.6.1   **Research Question 1: Are There Still no Relationships between Medical Students' Attachment Avoidance/Anxiety and Either Their Proportions of 'Provide Space' Responses or their Proportions of 'Affect Focused' Responses when Data from a More 'Demanding' Objective Structured Clinical Examination are Considered?**

To address research question 1, the relationships between attachment avoidance, attachment anxiety and proportions of 'provide space' and 'affect focused' responses were examined for the whole participant sample (Table 32).

Table 32

Correlations Between Attachment and Proportions of 'Provide Space' and 'Affect Focused' Responses: Study 2

Attachment dimension	Proportion of 'provide space' responses	Proportion of 'affect focused' responses
Attachment avoidance	.12	.06
Attachment anxiety	-.12	-.05

* = significant at *p* <.05,   ** = significant at *p* <.01,   *** = significant at *p* <.001

No relationships were observed between proportion of 'provide space' responses or proportions of 'affect focused' responses and either attachment avoidance or attachment anxiety. It was therefore possible to conclude, in answer to research question 1, that medical students' attachment was unrelated to their responses to simulated patients' cues of emotion in a more 'demanding' OSCE.

4.6.2   **Research Question 2: Are There Still no Relationships between Medical Students' Emotional Intelligence and Either Their Proportions of 'Provide Space' Responses or their Proportions of 'Affect Focused' Responses when Data from a More 'Demanding' Objective Structured Clinical Examination are Considered?**

To address research question 2, the relationships between EI and proportions of 'provide space' and 'affect focused' responses were examined for the whole participant sample (Table 33, overleaf).

Table 33

Correlations between Emotional Intelligence and Proportions of Provide Space' and 'Affect Focused' Responses: Study 2

MSCEIT score	Proportion of 'provide space' responses	Proportion of 'affect focused' responses
MSCEIT Branch 1 (Perceiving Emotions)	-.08	.06
MSCEIT Branch 2 (Facilitating Thought)	-.03	.04
MSCEIT Branch 3 (Understanding Emotions)	-.01	.07
MSCEIT Branch 4 (Managing Emotions)	-.09	.03
MSCEIT Area 1 (Experiential EI)	-.02	.09
MSCEIT Area 2 (Strategic EI)	-.01	.07
MSCEIT total EI	-.02	.06

* = significant at $p < .05$, ** = significant at $p < .01$, *** = significant at $p < .001$

No relationships were observed between EI and either proportions of 'provide space' responses or proportions of 'affect focused' responses. It was therefore possible to conclude, in answer to research question 2, that medical students' EI was unrelated to their responses to simulated patients' cues of emotion in a more 'demanding' OSCE.

4.6.3 **Hypothesis 3: Medical Students' Attachment Avoidance/Anxiety will be Negatively Related to their Objective Structured Clinical Examination Scores**

To address hypothesis 3, the relationships between attachment and overall OSCE score for the whole participant sample were examined (Table 34).

Table 34

Correlations between Attachment and Objective Structured Clinical Examination Scores: Study 2

Attachment dimension	Overall OSCE score
Attachment avoidance	-.26**
Attachment anxiety	.10

* = significant at $p < .05$, ** = significant at $p < .01$, *** = significant at $p < .001$

Overall OSCE score was significantly negatively correlated with attachment avoidance ($p = .00$) but not attachment anxiety. As in Study 1, hypothesis 3, that medical students' attachment avoidance and attachment anxiety will be negatively related to their OSCE scores, was partially supported by the data.

4.6.4 Hypothesis 4: Medical Students' Emotional Intelligence will be Positively Related to their Objective Structured Clinical Examination Scores

To address hypothesis 4, the relationships between EI and overall OSCE score for the whole participant sample were examined (reported in Table 35).

Table 35

Correlations between Emotional Intelligence and Objective Structured Clinical Examination Scores: Study 2

MSCEIT score	Overall OSCE score
Branch 1 (Perceiving Emotions)	.23**
Branch 2 (Facilitating Thought)	.21**
Branch 3 (Understanding Emotions)	.31**
Branch 4 (Managing Emotions)	.27**
Area 1 (Experiential EI)	.23**
Area 2 (Strategic EI)	.31**
Total EI	.31**

* = significant at $p < .05$,   ** = significant at $p < .01$,   *** = significant at $p < .001$

EI was significantly positively correlated with overall OSCE score. As in Study 1, hypothesis 4, that medical students' EI will be positively related to their OSCE scores, was supported by the data.

4.6.5 Hypothesis 5: The Model of Patient-Provider Communication Developed in Study 1 Will Be a Good Fit to Data Collected From the Current Study

The final SEM from Study 1 (Figure 13) was applied to data from the current study to examine its fit when applied to data from a more 'demanding' OSCE.

Figure 13

Modified Model of the Relationships between Attachment Avoidance, Emotional Intelligence and Objective Structured Clinical Examination Scores: Study 1
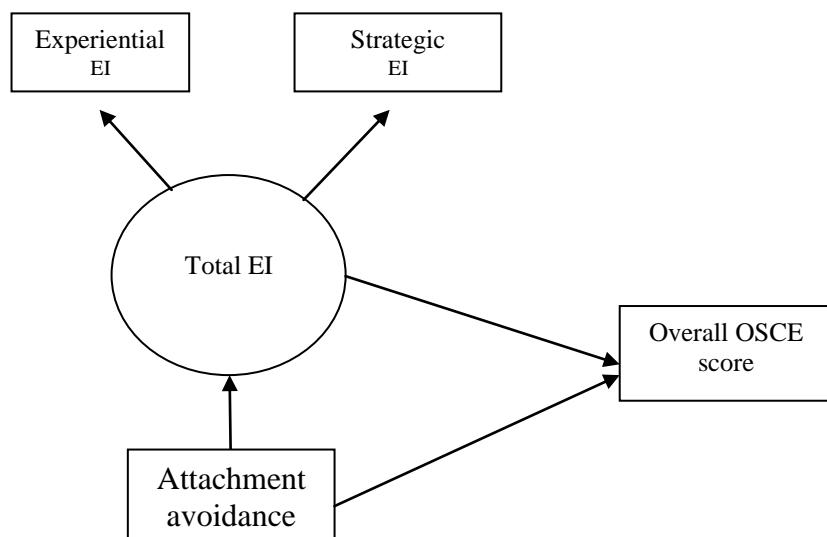
Minimisation was successful. Figure 14, overleaf, displays the final model, including standardised path coefficients for each path.

Figure 14

Final Model of the Relationships between Attachment Avoidance, Emotional Intelligence and Objective Structured Clinical Examination Scores: Study 2
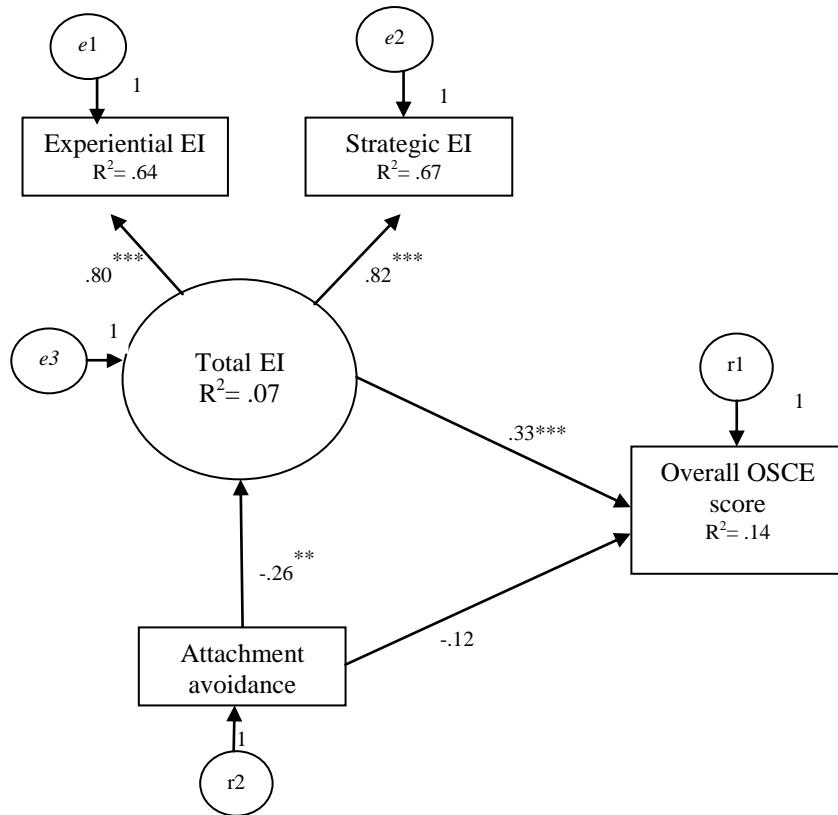
* = significant at $p < .05$, ** = significant at $p < .01$, *** = significant at $p < .001$

Note: e = measurement error in observed variables; r = residual error; R^2 = coefficient of determination

As in Study 1, the data were an acceptable fit to the model ($X^2(1, 133) = .71$, $p = .40$; CMIN/ d.f. = .71, RMSEA = 0.00 (90% confidence boundary .00 to .22), CFI = 1.00) and the relationships observed in Section 4.3.2.1 of this chapter between attachment avoidance and EI remained significant. Attachment avoidance accounted for 7% of the variance in students' EI, a lower percentage than the 13% observed in Study 1. EI had a direct and significant effect on overall OSCE scores and significantly predicted 14% of the variability in students' overall OSCE scores, a higher proportion than the 7% observed in Study 1. As in Study 1, no direct effect of attachment avoidance on overall OSCE scores was observed. Bootstrap estimates and percentiles for direct effects can be found in Table 36, overleaf.

Table 36

Direct Effects in the Final Structural Equation Model: Study 2

Regression path	Mean regression weight estimate	Mean bootstrapped regression weight estimate	SE of bootstrapped regression weight estimates	Bias	Bootstrap percentile (95) with bias correction	
					Lower bounds	Upper bounds
EI ← avoidance	-.68**	-.68**	-.01	.01	-1.22	-.18
Overall OSCE score ← avoidance	-.14	-.14	-.01	.00	-.30	.05
Overall OSCE score ← EI	.15***	.15***	.00	.00	.06	.24
Strategic EI ← EI	1.00	.1.00	.00	.00	1.00	1.00
Experiential EI ← EI	.88***	.88***	.02	.02	.56	1.39

* = significant at *p* <.05,   ** = significant at *p* <.01,   *** = significant at *p* <.001

Note: SE = standard error

For the significant parameters in the final SEM (i.e. all of the parameters with the exception of the attachment avoidance to EI parameter), zero was not within any of the estimated regression weight's confidence intervals, indicating that the modelling of the parameters was justified given that the estimates were significantly different from zero. Both the standard error of the bootstrapped standard error estimates and the bias were low, indicating that the regression weights produced by the model could be interpreted without fear that departures of multivariate normality from the small sample biased the calculation of the parameters. No modification indices were estimated to make a significant contribution to the model (i.e. a modification index value of over 4), therefore no subsequent modifications were made to the model and the model was treated as final. Section 2.1 of Appendix 6 contains further details of model fit and regression weights.

4.7   Summary of the Results

This study further demonstrated that medical students' attachment styles and EI were related to their PPC, by replicating the findings of Study 1 in a cohort communicating in a more 'demanding' OSCE. Relationships were found between medical students' attachment styles and their EI; these were similar in strength and direction as those observed in Study 1. In each study, attachment avoidance was significantly negatively correlated with overall OSCE score; whilst weak, the strength and direction of the correlations were similar. Total EI was significantly positively correlated with overall OSCE score in each study, again similar in strength and direction to Study 1. Consistent to both studies, a parsimonious SEM revealed that attachment avoidance, whilst accounting for a small proportion of the variance in total EI scores, did not significantly predict overall OSCE scores. Total EI was a significant predictor of overall OSCE scores in both Study 1 and Study 2, accounting for 7% and 14% of the variance in OSCE scores respectively. The consistency of the findings across both studies, irrespective of the change in OSCE assessment tool, length and focus, indicates the robustness of the final SEM. However, no relationships were observed in either study between students' responses to simulated patients' cues and either their attachment or their EI, indicating that whilst attachment avoidance and EI influence OSCE scores, quantifying and studying students' responses to simulated patients' cues (using the VR-CoDES) did not provide clarity regarding the mechanism by which this occured.

5   Discussion

5.1   Introduction

This section discusses the implications of the results of Study 2. The descriptive characteristics of the sample are first discussed with reference to published literature and to the participant characteristics from Study 1 to provide a context for interpreting the results of the research questions and hypotheses. Each research question and hypothesis is then discussed in turn. The overall conclusions of Study 2 and its associated strengths and limitations are then briefly summarised in order to provide a rationale for the final study.

5.2   Descriptive Characteristics

As with Study 1, the distribution of attachment avoidance and attachment anxiety scores across the cohort indicated a range of underlying comfort with close relationships, with the majority of students scoring roughly in the middle of the two dimensions. In this study, 89.53% of the cohort completed the ECR:SF. The increased sample size compared with Study 1 allowed for greater confidence in concluding that the attachment patterns of the medical students studied in this thesis were representative of both the whole cohort and of other published medical student samples (Ciechanowski et al., 2004, Hick, 2009, Atherton et al., 2009). Participants' attachment avoidance scores remained stable between the two study time points but attachment anxiety scores were significantly higher in Study 2 than in Study 1, contrary to previous literature (Del Giudice, 2011). Gender differences in attachment have been reported, which become more pronounced in individuals in their early- to mid-twenties, peaking at between 20 and 30 for attachment anxiety and increasing linearly with age for attachment avoidance (Del Giudice, 2011). Gender differences were observed in both Study 1 and Study 2 but the decrease in attachment anxiety scores between the two studies was driven by female students; no differences were found in male students' scores. These data support the findings of Del Giudice (2011), suggesting that the cohort studied reflect other international and national college age cohorts. The small degree of change, and the fact that the change fell within one standard deviation of the mean allowed for the tentative conclusion to be drawn that medical students' attachment styles remained relatively stable across the first two years of undergraduate medical education.

Participants' mean total MSCEIT scores again fell below that of other empirical studies (Brannick et al., 2009, Todres et al., 2010) and that of the normative mean of 100 proposed by the test publishers, falling into the 'consider improvement' category (Mayer and Salovey, 1997). The gender differences in EI observed in Study 1 persisted in Study 2, further supporting the notion that females score higher than males on measures of ability-based EI (Carrothers et al., 2000, Todres et al., 2010). No significant differences were found in students' mean total MSCEIT scores between the two studies. This is in line with the findings of other studies (Stratton et al., 2008, Todres et al., 2010, Leddy et al., 2011) and demonstrates the stability of medical students' EI over the first two years of their undergraduate medical education. Students received a number of clinical placements between the two study time points and it is generally accepted that entering the clinical workplace is a particularly challenging time for students emotionally (Pearson, 2011), which is unsurprising considering the wide-range of positive and negative emotions that occur in students on a day-to-day basis whilst undertaking work-based learning in a clinical setting (Kasman et al., 2003). A decline in students' empathy over the course of their undergraduate medical education is well documented (Hojat et al., 2004, Spencer, 2004, Neumann et al., 2011). However, this has been recently challenged, with suggestions that the reported decline in empathy across the medical literature is minimal and a product of such studies' low and varying response rates (Colliver et al., 2010). In the current study, the lack of change in students' EI suggests that ability-based EI is more than just empathic tendencies and supports the notion of ability based EI being a form of social intelligence in its own right (Mayer et al., 1999).

Negative correlations were observed between attachment avoidance and all sub-scales of EI (with the exception of Branch 1 and Branch 3), irrespective of participants' gender. Whilst the strength of these relationships was generally weak (Field, 2009), the findings are consistent with previous literature (Kafetsios, 2004) and data from Study 1. These data together support the commonly-accepted notion that an individual's EI develops partly as a function of their attachment style (Kafetsios, 2004), and that the relationship between the two constructs continues into adulthood (Cassidy and Shaver, 2008). Interestingly, no significant associations were found between attachment anxiety and EI, indicating that attachment avoidance may

be a stronger influencer of an individual's EI than their attachment anxiety (Kafetsios, 2004).

As with Study 1, no relationships were found between students' overall OSCE scores and either their proportions of 'provide space' responses or their proportions of 'affect focused' responses. These data indicate that second-year PPC assessment procedures (OSCEs) at the University of Liverpool measure different, although possibly complementary, skills and behaviours than those involved in recognising and responding to simulated patients' emotional cues in a way that facilitates further disclosure of emotion. The dependent variables in this study were therefore considered discrete throughout analyses.

Participants' mean overall OSCE score was 67.10%, lower than the mean of 91.78% observed in Study 1. Their marks also displayed far greater variance than the marks in Study 1, ranging from 48.94% to 84.53% in the current study, in contrast to 70.83% to 100.00% range in Study 1. At first glance, these data appear to indicate that students' PPC skills or abilities *decrease* across the first two years of undergraduate medical education, and thus appear to contradict previous literature (Humphris and Kaney, 2001). However, it is important to consider how differences in the function of, and scoring of, the OSCE between the two studies may have influenced the mean and variance of students' scores. The OSCE in the current study was more 'demanding' for students than that of Study 1, reflective of students' progression through undergraduate medical education. Furthermore, the use of the modified LUCAS to assess PPC may also have influenced the comparability of the two studies' findings. Whilst based on the same measure, the modified LUCAS has a greater range of scoring options available than the LUCAS. The greater range of scoring may therefore have increased the sensitivity of the modified LUCAS to students' performances, and thus allowed examiners to better differentiate between poorly performing students and excellent students.

Participants displayed 'provide space' responses in 45.01% of occasions, of which a third of these were 'content exploration' responses and a fifth of these referred directly to the affective element of the cue. Mean proportion of 'provide space' responses was lower than observed in Study 1, potentially reflecting the emotional presentation of the simulated patient, the added clinical assessment

element of the OSCE and students' additional 12 months of clinical and educational training between the two studies. For example, it is possible that the additional level of training may have increased students' abilities to provide the patient with information during a consultation and hence reduced their proportion of 'provide space' responses from Study 1 to Study 2 (Mjaaland et al., 2011). In support of this is the finding that 25.59% of students' responses to cues in the current study had the function of providing information to the simulated patient, compared with 4.27% in Study 1, indicating changes in students' informational responses to cues as a function of progression through medical school. However, it is encouraging to note the increase in proportions of 'affect focused' responses between the two studies. Participants' proportions of 'affect focused' responses increased from 14.21% in Study 1 to 16.01% in Study 2. This indicates that even though less space was provided for discussion of cues, participants in Study 2 focused *more* on the affective elements of cues than those in Study 1. No gender differences were observed in either proportions of 'provide space' responses or proportions of 'affect focused' responses, triangulating the results of Study 1 and supporting the findings of Hick (2009).

These findings provide a context for interpreting the results of the analyses addressing the hypotheses and research questions. The next section discusses these analyses with relation to the aim of the study: to further the findings of Study 1 by exploring the influences of second-year medical students' attachment styles and EI on their PPC in a more 'demanding' OSCE setting.

5.3   Research Questions and Hypotheses

5.3.1   Research Question 1: Are There Still no Relationships between Medical Students' Attachment Avoidance/Anxiety and Either Their Proportions of 'Provide Space' Responses or their Proportions of 'Affect Focused' Responses when Data from a More 'Demanding' Objective Structured Clinical Examination are Considered?

No relationships were found between medical students' attachment avoidance/anxiety and either their proportions of 'provide space' responses or their proportions of 'affect focused' responses. These data triangulate and support data from Study 1. A greater proportion of students provided attachment data in Study 2

than in Study 1 (89.53% and 51.40% of the cohort respectively); findings can therefore be considered to be more representative of the medical student cohort. The congruence of these findings with both the findings of Study 1 and those of previously published literature (Atherton et al., 2009, Hick, 2009) further support the notion of there being no relationships between medical students' attachment styles and their proportions of 'provide space' and 'affect focused' responses when assessed in a time-limited OSCE setting using the VR-CoDES.

However, as in Study 1, these data may be a function of the artificiality of the OSCE setting when compared to clinical practice, participants' level of training and their possible reliance on learned PPC behaviours in order to satisfy the OSCE criteria, rather than attachment style not impacting on ability to explore emotive issues. For example, students were aware upon entering the videoed OSCE station that the simulated patient was required to interact with them regardless of the student's initial handling of the simulated patient's concerns or frustrations. Students may, therefore, not have initially engaged or interacted with the simulated patient in the same way as they might had they been required to interact with a 'real' patient. For example, in the real clinical milieu, they may be more likely to spend time discussing patients' initial concerns and frustrations, particularly given that the opening moments of a consultation are essential for building a therapeutic relationship (Robinson, 1998). Exploration of the relationships between attachment styles and responding to patients' cues in real-life clinical practice would therefore be beneficial for further exploration of the validity of the notion outlined above and to reduce the possible assessment bias associated with use of the OCSE.

5.3.2 Research Question 2: Are There Still no Relationships between Medical Students' Emotional Intelligence and Either Their Proportions of 'Provide Space' Responses or their Proportions of 'Affect Focused' Responses when Data from a More 'Demanding' Objective Structured Clinical Examination are Considered?

As with Study 1, no relationships were found between medical students' EI and either their proportions of 'provide space' responses or their proportions of 'affect focused' responses. It is interesting to note the similar strength and direction of the relationships between EI and responses to cues across Studies 1 and 2. This is

despite length of consultation time doubling from Study 1 to Study 2, and students benefitting from an additional year of teaching regarding appropriate recognition of and responding to patients' emotional cues.

It is probable that there was an optimal level of 'provide space' or 'affect focused' responses for the videoed station, an increase or decrease in which would negatively affect the student-simulated patient rapport and result in a patient's disengagement from the consultation. High EI may allow for accurate identification of the optimal level of responses and adoption of appropriate behaviours. Low EI may result in students ignoring the patient's cues of dissatisfaction in order to immediately begin the consultation, or else adopting an overly emotive perspective incongruent with the patient's wishes. This may pose one explanation for the lack of linear relationships observed between proportions of 'provide space'/'affect focused' responses and students' EI, and therefore the lack of significant findings.

The consistent lack of relationships observed across both studies suggest that if EI does impact on students' responses to cues during examinations in undergraduate medical education, then the process may occur via a more subtle mechanism than that quantified in the current thesis. Whilst the lack of observed relationships may be in part due to the artificial OSCE setting studied, the findings suggest the need for further research; Studies 1 and 2 provide a firm foundation and rationale for such research.

5.3.3 Hypothesis 3: Medical Students' Attachment Avoidance/Anxiety will be Negatively Related to their Objective Structured Clinical Examination Scores

As in Study 1, medical students' attachment avoidance was negatively weakly related to their overall OSCE scores, indicating that students with high attachment avoidance were rated as poorer communicators by examiners than their counterparts. Whilst the influence of attachment avoidance was not found in proportions of 'provide space' or 'affect focused' responses (see Section 5.3.1 of this chapter), these data indicate that low attachment avoidance may relate to the ability to appropriately and empathically address sensitive topics in a manner in line with level of training and examiners' expectations, and therefore result in higher examination marks.

In order to score highly across all three PPC stations, students were required to supplement their PPC skills with a range of behaviours designed to build and maintain a natural rapport with simulated patients who were reluctant to engage in conversation. Students were expected to display appropriate skills, rather than the behaviours expected in Study 1, and were scored on a Likert scale with a greater range of response options to reflect their skill level. Clearly, the OSCE in Study 2 was designed to challenge students' PPC and therefore students that displayed behaviours incongruent with promoting patients' engagement with the consultation or fostering a therapeutic relationship or rapport were scored lower than those able to adequately manage patients' frustrations. The strength of the correlation between attachment avoidance and overall OSCE scores increased from -.16 in Study 1 to -.26 in Study 2. This indicates that the influence of attachment avoidance may be stronger in emotionally demanding consultations, such as those in Study 2, possibly because this type of consultation is thought to activate the attachment processes associated with high attachment avoidance (Salmon et al., 2008). By considering a more 'demanding' OSCE, in which students were marked on their abilities to elicit clinical information from simulated patients and display appropriate and effective PPC, the relationships observed in the current study can be considered more generalisable to clinical practice than the findings of Study 1 alone.

No relationships were observed between medical students' attachment anxiety and their overall OSCE scores, supporting the findings of Study 1 but contradicting the findings of Hick (2009) and Salmon (2007, 2008). Both Hick and Salmon found attachment anxiety to be related to PPC, through its influence on students' OSCE scores and doctors' likelihoods of proposing somatic interventions from MUS patients respectively. The congruence of the findings of the current study with those of Study 1 allow for conclusions to be drawn regarding the influence of attachment anxiety on OSCE scores only in the medical student cohort studied in this thesis. However, further research is needed to examine whether this phenomena is unique to the cohort studied, or applicable to students or practising doctors later in their career.

5.3.4 Hypothesis 4: Medical students' Emotional Intelligence will be Positively Related to their OSCE Scores

As in Study 1, medical students' EI significantly positively influenced their OSCE scores. Branch 3 (understanding emotions) was the Branch most strongly correlated with overall OSCE scores, indicating that students with increased ability to understand their own emotions and those of simulated patients demonstrated more appropriate and effective PPC behaviours in examiners' eyes than those who were less able. In contrast to Study 1, Branch 4 was not the strongest predictor of overall OSCE scores of all the four Branches of EI, despite significantly positively correlating with overall OSCE score. Consideration of the nature of the OSCE may provide some context to interpret these findings; students were required to manage 'difficult' patients in their second-year OSCE and therefore the ability to recognise simulated patients' initial feelings and emotions (Branch 3) may have been a more valuable attribute for medical students to have than the ability to manage their own emotions (Branch 4).

Students, at the end of their second year of undergraduate medical education, had had experience of three separate OSCEs (Year 1 formative OSCEs, Year 1 summative OSCEs and Year 2 formative OSCEs). Branch 4 may have initially aided students in identifying and managing their own stress levels in Year 1 OSCEs. However, this Branch may be less important for successful OSCE performance at this point in students' medical education. In contrast, Branch 3 provides a mechanism by which to interpret social cues and guide emotional self-regulation and behaviour (Lopes et al., 2005) and in this respect may been a more valuable asset for students to have in their second year OSCE, given simulated patients' initial presentations.

Data from both the current study and from Study 1 suggest that participants who were better able to understand emotions and use their own and others' emotions to facilitate their thought and behaviour were viewed as more competent communicators than their counterparts on a range of dimension. Furthermore, they were able to demonstrate these skills effectively in a high pressure and time limited environment. However, the inclusion of a greater range of responses on the modified LUCAS allowed examiners to rate students' skills as well as their behaviours, and

therefore allowed for identification of excellent communicators rather than just discriminating between poorly performing students (as the LUCAS did). The consistency in findings between the two studies, irrespective of the change in the OSCE checklist, indicates that relationships between EI and PPC observed in Study 1 still exist when considering excellent as well as problematic communicators. As with the findings regarding attachment, the strength of the correlation between total EI and overall OSCE score observed in the current study was higher than in Study 1, increasing from .23 to .31. It therefore seems that the influence of both attachment and EI on PPC increased when students communicated in a more emotionally 'demanding' OSCE situation, more reflective of a consultation within the clinical milieu (Silverman et al., 2005). .

However, as with Study 1, participants' mean total EI (83.73, $SD = 16.60$) was significantly lower than the normative mean of 100 proposed by the test publishers and that reported in similar medical student samples (Todres et al., 2010, Brannick et al., 2009). It was therefore not possible to draw firm conclusions regarding the notion of a minimum level of EI, after which impact on PPC is lessened. Further research is required with a different sample to investigate this further, preferably in the real life clinical milieu.

5.3.5 Hypothesis 5: The Model of Patient-Provider Communication Developed in Study 1 Will Be a Good Fit to Data Collected From the Current Study

Data supported the hypothesis that the model of PPC developed in Study 1 would be a good fit to data collected from a more 'demanding' OSCE; when investigated with SEM, the relationship between attachment avoidance and EI remained significant, with attachment avoidance accounting for 7% of the variance in students' EI. As in Study 1, the relationship between attachment avoidance and overall OSCE score became insignificant, with EI being the only significant predictor of overall OSCE score. EI predicted 14 % of the variance in OSCE scores, a higher proportion than the 7% observed in Study 1. These data indicate that EI is a stronger predictor of PPC success when more 'global' PPC competence is considered (Silverman et al., 2005).

Taken in conjunction with the findings of Study 1, these data indicate that the mediating effect of EI on PPC extends to students one year later in their training,

communicating in a more 'demanding' OSCE, rather than being limited to relatively inexperienced first-year medical students. This is particularly pertinent given that the students in the current study had received teaching in the recognition and management of patients' emotional distress, and had all received individualised clinical placement experiences since Study 1. Subjective early experiences whilst on placement have been found to shape students' PPC development (Royston, 1997), therefore it is pertinent to note the continued mediating effect of EI on OSCE scores, seemingly irrespective of previous experience or teaching. Whilst a large proportion (86%), of the variance in students' overall OSCE scores was *not* explained by their attachment avoidance or EI scores, the potential educational implications arising from these data must be considered, and are discussed further in Chapter 8. However, clearly, the mediating effect of EI on the relationship between attachment avoidance and PPC may be limited to the assessed environment and therefore these relationships would benefit from being further examined in a clinical setting with practising doctors.

6   Methodological Considerations, Strengths and Possible Limitations

This study has a number of strengths. First, it is a unique contributor to the research literature regarding PPC in undergraduate medical education; of particular commendation is the application and furthering of the SEM devised and tested in Study 1, investigating the indirect and direct relationships between attachment avoidance, EI and medical students' PPC. These data provide a platform on which to base subsequent research. Additionally, confirmation of the lack of relationships between students' attachment styles and EI and their responses to simulated patients' cues indicates the generalisability of the findings of Study 1 to medical students further in their undergraduate medical education.

Second, the use of simulated patients and standardised scenarios allowed for collection of comparable data to Study 1 and subsequently more sophisticated analyses than if a different approach had been taken. The choice of measure to assess PPC was also a strength; consideration of a more 'demanding' OSCE in terms of length and presentation increased the transferability and generalisability of the findings in comparison to the findings of Study 1, particularly when combined with the increased response rate (participation rate of 77.49% overall, an increase of

21.62% from Study 1). Use of the modified LUCAS to assess PPC also increased the range of possible scores and allowed for consideration of the students' skill levels in eliciting clinical information from simulated patients. In this respect, the modified LUCAS provided richer data regarding students' PPC ability than available in Study 1, with subsequently more clinically representative applications.

However, as with any study, the limitations of the current approach must also be considered. Whilst the sample size was much increased from Study 1, a response rate of less than 100% limits the generalisability of the findings. Of note, however, is that across the course of the two studies 92.49% of the cohort participated at least once. This is important as it suggests that the participant samples in Studies 1 and 2 were representative of the whole cohort studied, rather than reflecting a small group of willing participants whose demographics may differ from the wider cohort. However, difficulties when collecting data resulted in 26.69% of students' videos being unusable. For example, interference from an examiner's mobile telephone, placed too near to the camera, distorted the sound on several videos. Whilst these students did not demographically differ from the students for whom video data were collected, their PPC may have differed and therefore may have changed the results of some analyses.

It is also important to consider limitations associated with the chosen analyses. Some participants in this study had also participated in Study 1. However, it was not possible to run the SEM using data from the longitudinal and non-longitudinal participant samples separately and compare their fit due to the small sample sizes in each participant group. Whilst non-longitudinal and longitudinal participants did not differ in terms of their attachment styles, EI, OSCE scores or proportions of 'provide space' or 'affect focused responses', it was not possible to generalise that the SEM fitted equally well to each participant group. The aim of this study was *not* to examine changes in their PPC longitudinally as a function of their attachment styles or EI; however, references were made in the discussion to the results of Study 1 and how the results of the current study differ from, or are similar to, them. Clearly, it is not possible to make inferences regarding the stability of the findings of Study 1 without further, longitudinal, examination of the stability of the

model using one participant cohort. Longitudinal research, with larger sample sizes, is therefore clearly required to investigate this further.

Furthermore, it is important to consider that the modified LUCAS may not be generalisable to non-assessed contexts or real clinical settings, despite being reflective of the current assessment procedures at the University of Liverpool, and more context sensitive than many other OSCE instruments (Huntley et al., 2012). Similarly, whilst the increased proportion of 'information provision' responses reflected a scenario and population more appropriate for application of the VR-CoDES, application to an assessed OSCE setting may have resulted in different results than if applied to a non-assessed, clinical setting with qualified doctors, as originally intended by its authors (Del Piccolo et al., 2009) (see Chapter 7 for discussion of this point). These limitations should be taken into consideration when interpreting the findings.

7   Conclusions and Rationale for Study 3

This study can conclude that the relationships found between attachment avoidance, EI and PPC in Study 1 also exist when students were required to interact in a more 'demanding' OSCE. The proportion of variance in students' overall OSCE scores explained by their EI doubled from the 7% observed in Study 1 to 14%. This indicates that EI has a stronger influence on students' examiner-rated PPC at a later stage in their undergraduate medical education when more global PPC competence is considered (Silverman et al., 2005).

The results, when combined with those of Study 1, have important *educational* implications for undergraduate medical curricula. These implications are discussed further in Chapter 8. However, the generalisability of the findings to real life clinical practice is unclear, given the assessed and simulated nature of the PPC interactions studied. Medical students' PPC with patients in simulated settings may differ significantly from their PPC with real patients in a clinical setting (Hanna and Fins, 2006, Ram et al., 1999). It is therefore important to consider whether the findings of Study 1 and Study 2 translate into the real clinical environment, thus also providing *clinical* implications for practice. The next chapter reports the thesis' third and final empirical study (Study 3), which studies the relationships between providers' attachment styles, EI and PPC in the real, clinical milieu.

Chapter 6: Study 3 - Pilot Study Exploring the Relationships between Junior Doctors' Attachment Styles, Emotional Intelligence and Patient-Provider Communication

1   Introduction

The results of Studies 1 and 2 provided insight into the influence of early-year medical students' attachment styles and EI on their PPC during early undergraduate medical education. However, the design of Studies 1 and 2 prevented any firm conclusions being made regarding the impact of providers' attachment styles and EI on their PPC beyond the simulated OSCE environment.

The purpose of this chapter is therefore to report the rationale, methodology, results and implications relating to the third and final cross-sectional study reported in this thesis. This study is a preliminary pilot study. It builds on the findings of Studies 1 and 2 by examining the relationship between attachment, EI and PPC in doctor-patient consultations in General Practice, above and beyond the effects of undergraduate PPC skills' teaching and learning.

2   Aim

To explore the relationships between attachment styles, EI and PPC in a postgraduate junior doctor sample[70] consulting in General Practice.

3   Methods

3.1   Ethical Approval

Ethical approval for this study was granted by the NHS Northwest Two Research Ethics Subcommittee and the Strategic Health Authority Research and Development Office (see Section 3 of Appendix 1).

3.2   Design

The same independent variables[71] were considered as in Studies 1 and 2 to maximise comparability of findings. The following dependent variables were considered:

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[70] The postgraduate junior doctor sample were in their second Foundation year and thus were two years post-graduation

1. Number of patient cues (VR-CoDES)

2. Proportion of 'provide space' responses to patients' cues (VR-CoDES)

3. Proportion of 'affect focused' responses to patients' cues (VR-CoDES)

4. Patients' ratings of satisfaction with the PPC in their consultations (Communication Assessment Tool- Short Form, CAT-S)

3.3   Research Questions

The following research questions were investigated:

1. Research question 1: What influences do junior doctors' attachment styles and EI have on the number of cues presented by patients?

2. Research question 2: What influences do junior doctors' attachment styles and EI have on their proportions of 'provide space' responses to patients' cues?

3. Research question 3: What influences do junior doctors' attachment styles and EI have on their proportions of 'affect focused' responses to patients' cues?

4. Research question 4: What influences do junior doctors' attachment styles and EI have on patients' ratings of satisfaction with the PPC in their consultation?

3.4   Participants

All junior doctors in their second Foundation year within the Mersey Deanery undertaking a rotation in a consenting General Practice surgery between November 2010 and March 2012 were invited to participate ($N = 122$), together with a sample of their patients (see Section 3.5 of this chapter for procedure).

3.5   Procedure for Data Collection

The Mersey Deanery provided the author with a list of General Practice surgeries hosting junior doctors during the study period, together with the contact details for each surgery and junior doctor. An invitation letter was sent out to each surgery prior to the start of each rotation explaining the purpose of the study and

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[71] Junior doctors' attachment avoidance and attachment anxiety, measured using the ECR:SF, and EI, measured using the MSCEIT

asking for the surgery's consent (see Section 3.1 of Appendix 5). Once surgery consent was gained, the junior doctor placed at the surgery was emailed an invitation to participate (see Appendix 5). This email was sent in the last month of their placement in order to allow the junior doctor to settle into the GP surgery. Two reminder emails were sent to non-responding junior doctors and their supervisors (see Sections 3.3 and 3.4 of Appendix 5); if no subsequent reply was received then no further contact was made.

Once written informed consent was obtained from the junior doctor, a mutually convenient time was arranged for the research; generally one morning/afternoon in which at least five patients were expected to attend an appointment with the junior doctor. The surgery administration team advised patients of the study when booking appointments over the phone and made them aware that non-consent would not impact on their care. Reminders and an information sheet were given to the patients by front desk staff upon patients' arrival (see Section 3.3 of Appendix 4). In a minority of surgeries, this approach was not possible; staff therefore provided all relevant patients with an information sheet upon arrival. Written informed consent was sought by the author immediately prior to patients' appointments respectively (see Section 3.4 of Appendix 4).

Each consenting patient's consultation was video recorded. The camera was only directed at the junior doctor and the author was not present during the consultation. No physical examinations were recorded; junior doctors were given instructions on how to stop the camera if patient consent was withdrawn during the consultation or it was not possible to conduct a physical examination without being in camera shot.

Patients were asked by the author to complete a questionnaire assessing their satisfaction with the PPC after their consultation (see Section 3.6.1 of this chapter). Junior doctors completed paper copies of the ECR:SF and MSCEIT after their last consultation and provided demographic data.

3.6   **Measures**

The ECR:SF, MSCEIT and VR-CoDES were used to quantify attachment, EI and PPC respectively; these were outlined in detail in Section 3.6 of Chapter 4 and

will not be discussed further in this chapter. The patient satisfaction questionnaire is summarised below.

3.6.1 The Communication Assessment Tool- Short Form

The CAT-S is a self-report measure of patient satisfaction with doctors' interpersonal and PPC skills (Makoul et al., 2007). It assesses finite PPC tasks and captures patients' views immediately post-consultation. In this way, it differs from other assessments of patient satisfaction that assess impressions of PPC over a longer time period.

The CAT-S consists of 15 short statements relating to perceptions of PPC. These 15 items were sourced from a review of models and prominent instruments for assessment of patient satisfaction with doctors' PPC. Each item was selected to acknowledge providers' individuality and potentially different means of accomplishing the same communicative task (Makoul et al., 2007). Each item begins with "the doctor..." (such as "*the doctor understood my main health concerns*"). All items are scored on a 5-point response scale with options that extend from 1 ('poor') to 7 ('excellent'). An overall score can be calculated, which can range from 15 to 75. However, the authors suggest differentiating between 'excellent' doctors (i.e. those scoring 7, or 'excellent', on all 15 items) and 'non-excellent' doctors in order to "*obviate the ceiling effects associated with use of patient-reported means*" and allow for a better indication of variability between doctors (Makoul et al., 2007).

The CAT-S is a valid means of differentiating between doctors scoring high or low on other patient satisfaction scales, particularly when the dichotomous scoring approach is taken (Makoul et al., 2007), as adopted in this study. Using this approach, a full scale reliability of .96 across doctors and .80-.99 between doctors (mean .95), has been reported, indicating the reliability and validity of the CAT-S in assessing patients' perceptions of doctors' interpersonal and PPC skills (Makoul et al., 2007).

In addition to supplementing VR-CoDES data, the CAT-S was chosen for use in this study for a number of reasons. It focuses on provider individuality, demonstrates high levels of reliability and validity and assesses core competencies of communication similar to those assessed using the LUCAS/modified LUCAS

(Huntley et al., 2012), thus allowing for a degree of comparison between the studies reported in this thesis. A copy of the CAT-S is included in Section 6 of Appendix 2.

3.7   **Justification for Sample Size**

This study was designed as a preliminary pilot study as time constraints limited the amount of data collection possible. Nonetheless, power analysis was still calculated to determine the amount of participants required to adequately power the largest statistical analysis performed, multilevel modelling, with awareness that recruitment of such a sample may not be possible. Calculation of power ensured the author was aware of the limits of the analyses and could treat the data accordingly.

Power is difficult to accurately estimate for multilevel models, due to their complexity and the fact that methods developed to estimate the number of participants required to power single level designs cannot be directly translated to multilevel designs (Scherbaum and Ferreter, 2009). Scherbaum and Ferreter (2009) recommend that researchers base their power estimates on previously published intra-class correlation coefficients relating to the variables being studied. However, this approach was not possible given that no previous literature, at the time of writing, had considered the influence of both attachment and EI on doctors' PPC. The theoretical and simulation literature was therefore consulted to provide the best estimate of the sample size required for study power.

In this study, patients were nested within doctors, and therefore the planned models had two levels: Level 2[72] and Level 1[73]. It is argued that, for testing the effect of a Level 2 variable (in this case, the effect of doctor-level characteristics), the Level 2 sample size is of greatest importance (Snijders, 2005). Level 2 sample sizes of greater than 30 have a minimal impact on the accuracy of the standard error for the fixed effects and therefore a Level 2 sample size of at least 30 is recommended for multilevel models (Maas and Hox, 2005). However, Level 2 sample groups of 25 participants can achieve adequate statistical power to reject the null hypothesis when medium to large effect sizes are expected (Maas and Hox, 2005).

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[72] Level 2 refers to the higher clustering level; in this case, the junior doctors
[73] Level 1 refers to the lower level; in this case, the consenting patients seen by each junior doctor

Kreft (1996) discusses what she terms the '30/30' rule, that is, recruitment of at least 30 groups, each with at least 30 individuals per group (i.e. a total sample size of 900). However, Snijders and Bosker (2012) discuss the importance of researchers balancing consideration of the practical and financial implications of recruitment with achieving the desired sample size. Therefore, to maximise Level 2 sample size, all junior doctors placed at participating surgeries for the duration of the research were invited to participate ($N = 122$). To maximise Level 1 sample size, all eligible patients of consenting junior doctors were invited to participate ($N = 204$). The study recruited 26 Level 2 participants and 173 Level 1 participants over 16 months, after which recruitment was halted. To maximise power, data were analysed as a whole rather than considering sub-groups of gender. These sample sizes, however, mean that Level 1 of the models may have been underpowered; this is discussed further in Section 6 of this chapter.

3.8   Data Management and Preparation

All data from returned questionnaires were entered into an SPSS version 20.0.1 database (IBM Corp, 2012b) and data were scored as appropriate (see Section 3.10 of Chapter 4). Random 9-digit computer-generated numbers acted as unique identifiers for each participant to ensure protection of anonymity. Hard copies of all questionnaires were stored in a locked filing cabinet in the author's office. Video data were transferred into individual MPEG digital computer files, labelled with the junior doctor's unique identifier. In order to link patient videos with patient questionnaires, each junior doctor's unique identifier was supplemented with (a) for the first patient, (b) for the second patient and so on and were stored on a password protected hard drive in the author's office. Reason for patient visit was categorised into 'psychosocial' (if the presenting complaint was related to mental health or due to social circumstances)[74] or 'physical'[75] (if the presenting complaint was not related to mental health or due to social circumstances). Categorisation was performed by the author, with a sample of 20 videos checked by the respective participating junior doctors to ensure accuracy. Videos were coded directly via computer using FOCUS

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[74] Defined as any presenting complaint involving psychological and/or social aspects of the patient's life, and relating to the patient's mental and emotional health
[75] Defined as any presenting complaint involving symptoms attributed to the biomedical criteria of recognisable organic pathology, but excluding the physical symptoms caused by psychiatric or psychosocial illnesses

III software (FOCUS III [computer software], 2011) (see Chapter 4). The coding records produced by the FOCUS III software were saved in Microsoft Excel format and then entered into the SPSS database for analysis.

Figure 15 shows the process from recruitment to analysis.

Figure 15

Flow Diagram to Show Study Recruitment and Procedure: Study 3

October 2010
- NHS ethical approval and R&D approval granted for Study 3

November 2011-March 2012
- Junior doctors videotaped in consultations with consenting patients, questionnaire data collected (ECR:SF and MSCEIT; CAT-S)
- Questionnaire data entered, videos transferred to electronic files and coded

April 2012
- Analysis of junior doctor data completed
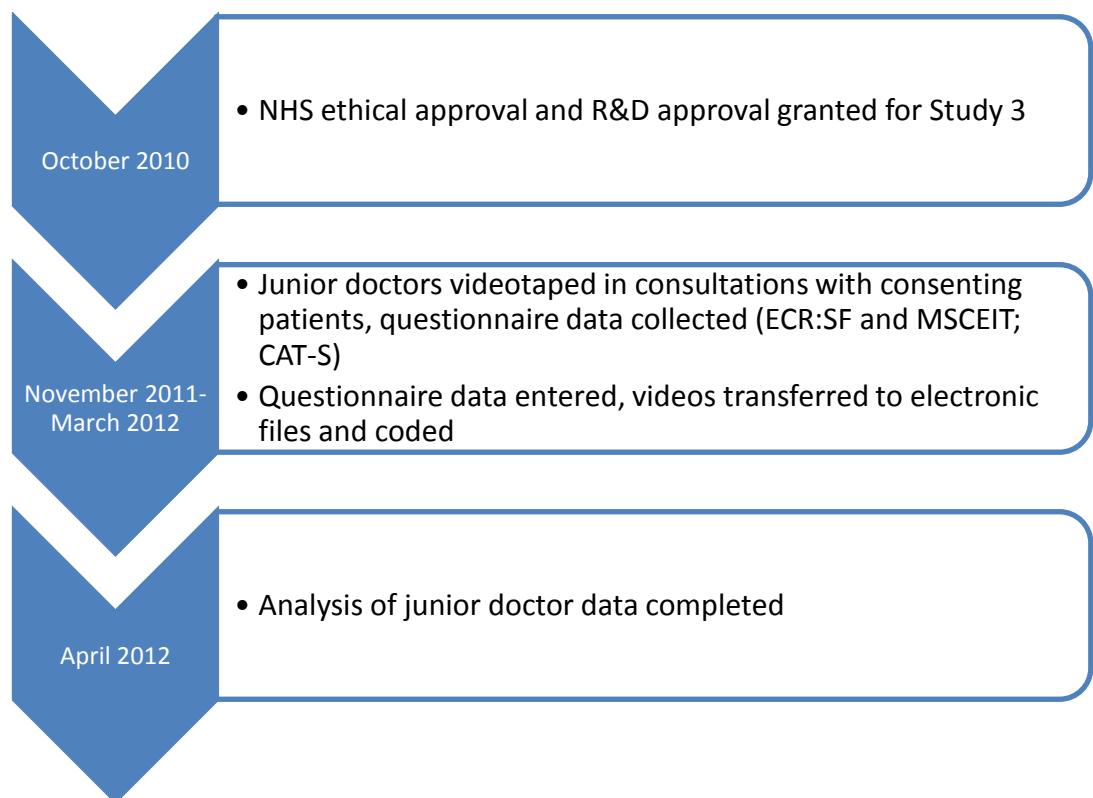
3.9   Data Analysis

As in Studies 1 and 2, data were checked systematically for missing data and imputation errors and to ensure relevant assumptions were met for each statistical analysis. Cues and concerns were collapsed together and proportions of 'provide space' and 'affect focused' responses were calculated. Pearson's product-moment correlations, independent sample t-tests, Chi-squared tests, one-way ANOVAs[76] and graphical plots were used as appropriate for preliminary data exploration.

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[76] A parametric statistical test used to test for differences in independent and identically distributed normal random variables between two or more groups.

Relevant patient-level and doctor-level variables were then transformed into dummy variables for analysis (see Section 1 of Appendix 6). A series of multilevel models[77] were used to address the research questions by separately considering the predictive value of both patient-level and doctor-level variables on the outcome measures. As the data collected were multilevel (hierarchical) given that patients (Level 1) were grouped within doctors (Level 2), the general framework of multilevel models was assumed where the dependent variable(s) were assumed to follow a distribution belonging to the exponential family. A two-level random intercept model[78] was adopted for each research question, in which patients were assumed to be random units sampled from the larger patient population of Merseyside. Doctors' unique ID numbers were used to account for clustering[79] at the doctor level in both models (equivalent to incorporating a doctor-specific random effect into the modelling framework).

3.9.1 Research Question 1: What Influences do Junior Doctors' Attachment Styles and Emotional Intelligence have on the Number of Cues Presented by Patients?

The outcome variable for research question 1 was number of cues presented during consultations; the set of all possible outcomes was therefore the set of non-negative integer values. The variable had count data and followed a Poisson distribution[80]. The XTPOISSON command (StataCorp, 2011) was therefore used to fit a multilevel Poisson regression model[81], accounting for clustering of patients within doctors (Rabe-Hesketh and Skrondal, 2012). Number of cues was first modelled as a function of the characteristics collected for each patient until a final patient-level model was obtained. Backward selection was based on Wald tests[82] and non-significant covariates were removed from the model (α = .05). All excluded

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[77] Statistical models of parameters that vary at more than one level

[78] A model that allows for variation at two levels: patients at the lower level and doctors at the higher level by incorporating a doctor-specific random effect into the modelling framework, thereby allowing the random intercepts to vary between doctors

[79] Clustering on doctors allows for the dependence between observations on the same doctor - this is achieved through the doctor-specific random effect.

[80] A discrete probability distribution that expresses the probability of a given number of events occurring in a fixed interval of time and/or space if these events occur with a known average rate and independently of the time since the last event

[81] A form of multilevel regression analysis which is used to model count data

[82] A parametric statistical test used whenever a relationship within or between data items can be expressed as a statistical model with parameters to be estimated from a sample. The Wald test is used to test the true value of a parameter based on the sample estimate

covariates were evaluated for their potential confounding effect by evaluating their influence on the coefficient of the remaining variables in the model[83]. Doctor-level explanatory variables were then added to the model.

3.9.2 Research Question 2: What Influences do Junior Doctors' Attachment Styles and Emotional Intelligence have on their Proportion of 'Provide Space' Responses?

The outcome variable for research question 2 was proportion of 'provide space' responses to patients' cues. This variable was initially treated as a normally distributed continuous response; however examination of data using a histogram showed that the data were non-normally distributed, with peaks at 0% and 100%. The nature of the distribution resulted in inflated variation in proportion of 'provide space' responses, and therefore it was not appropriate to assume a Gaussian distribution[84] and model proportion of 'provide space' responses using linear regression. Other modelling approaches were considered (for example sub-categorising the data into quartiles ($\leq 25\%$, 26%-50%, 51%-75% and $\geq 76\%$), thereby creating a new response variable with 4 response categories, and modelling these ordinal categorical responses using a proportional odds model[85]). However, categorising the data in this way was not considered to result in meaningful data for analysis, and therefore the decision was reached not to model the 'provide space' data.

3.9.3 Research Question 3: What Influences do Junior Doctors' Attachment Styles and Emotional Intelligence have on their Proportion of 'Affect Focused' Responses?

The outcome variable for research question 3 was proportion of 'affect focused' responses to patients' cues. This variable followed a normal distribution and was therefore treated as a normally distributed continuous response. The XTREG command (StataCorp, 2011) was used to fit a multilevel linear regression model accounting for clustering of patients within doctors. As in research question 1,

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[83] Not reported in the text unless removal produced >20% change in coefficient
[84] A standard normal distribution which is symmetric about its mean, and is non-zero over the entire real line
[85] A class of generalised linear models used for modelling the dependence of an ordinal response on discrete or continuous covariates

a final patient-level model was obtained (with non-significant covariates removed with backward selection), to which doctor-level explanatory variables were then added[86].

3.9.4 Research Question 4: What Influences do Junior Doctors' Attachment Styles and Emotional Intelligence have on Patients' Ratings of Satisfaction with the Patient-Provider Communication in their Consultation?

The outcome variable for research question 4 was CAT-S scores. In line with the author's recommendations (Makoul et al., 2007), data were treated as binary responses in which the doctor could be either scored as 'excellent' (1) or 'non-excellent' (0). This was confirmed by graphically examining the data; given the peak at 5 ('excellent'), it was felt appropriate to transform the raw data into binary response prior to modelling. A binary logit model[87] was fitted to the responses using the XTLOGIT command (StataCorp, 2011). In this model, data are assumed to follow a binomial distribution[88]. As in research questions 1 and 2, a final patient-level model was obtained (with non-significant covariates removed using backward selection), to which doctor-level explanatory variables were then added[89].

3.9.5 Software Used for Analysis

Descriptive and exploratory analyses were performed in SPSS 20.0.1 (IBM Corp, 2012b). Stata (version 12.0) was used to fit the models (StataCorp, 2011).

3.9.6 Additional Considerations

The same additional considerations as in Studies 1 and 2 were applied[90]. The results will now be presented.

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[86] This model was fitted to data from the 93 consultations in which cues were presented

[87] A class of generalised linear models used for modelling the outcome of a binary categorical dependent variable based on one or more predictor variables

[88] A binomial, or Bernoulli distribution, is the discrete probability distribution of the number of successes in a sequence of n independent yes/no experiments, each of which yields success with probability p

[89] This model was conducted only on completed patient satisfaction data (Level 1 n = 154, Level 2 n = 26)

[90] Figures reported to two significant figures. Two tailed analyses used throughout. Findings considered statistically significant at the $p < .05$, the $p < .01$ and the $p < .001$ levels. No analyses conducted in individual-level data to minimise chances of Type I errors. Exact p-values presented in text but not tables. Correlation effect sizes reported where appropriate and interpreted using standard

4   Results

4.1   Introduction

First, descriptive data and summary statistics are provided for the sample. Preliminary analyses are then presented, followed by Section 4.6 which addresses the main research questions. The section concludes with a summary of overall findings.

4.2   Descriptive Analyses

4.2.1   Surgery Characteristics

Out of the sample of 42 General Practice surgeries approached, 20 (47.62%) consented to take part in the study, from which junior doctors and patients were subsequently recruited. There were no differences in the number of training and non-training practices that consented. Both urban and suburban practices participated.

4.2.2   Participant Characteristics

Out of the sample of 122 junior doctors approached, 26 (21.31%) doctors participated. All 26 doctors completed the ECR:SF and MSCEIT (100.00%). Out of the sample of 203 patients approached, 173 (85.22%) participated. Video data were available for all 173 consenting patients (100.00%) and CAT-S data were available for 154 patients (89.02%). Figure 16, overleaf, shows the process from recruitment to analysis.

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conventions: small effect size, $r = .10 - .23$; medium effect size, $r = .24 - .36$; and large effect size, $r \geq .37$ (Cohen, 1992).

Figure 16

Flow Diagram From Recruitment to Analysis: Study 3
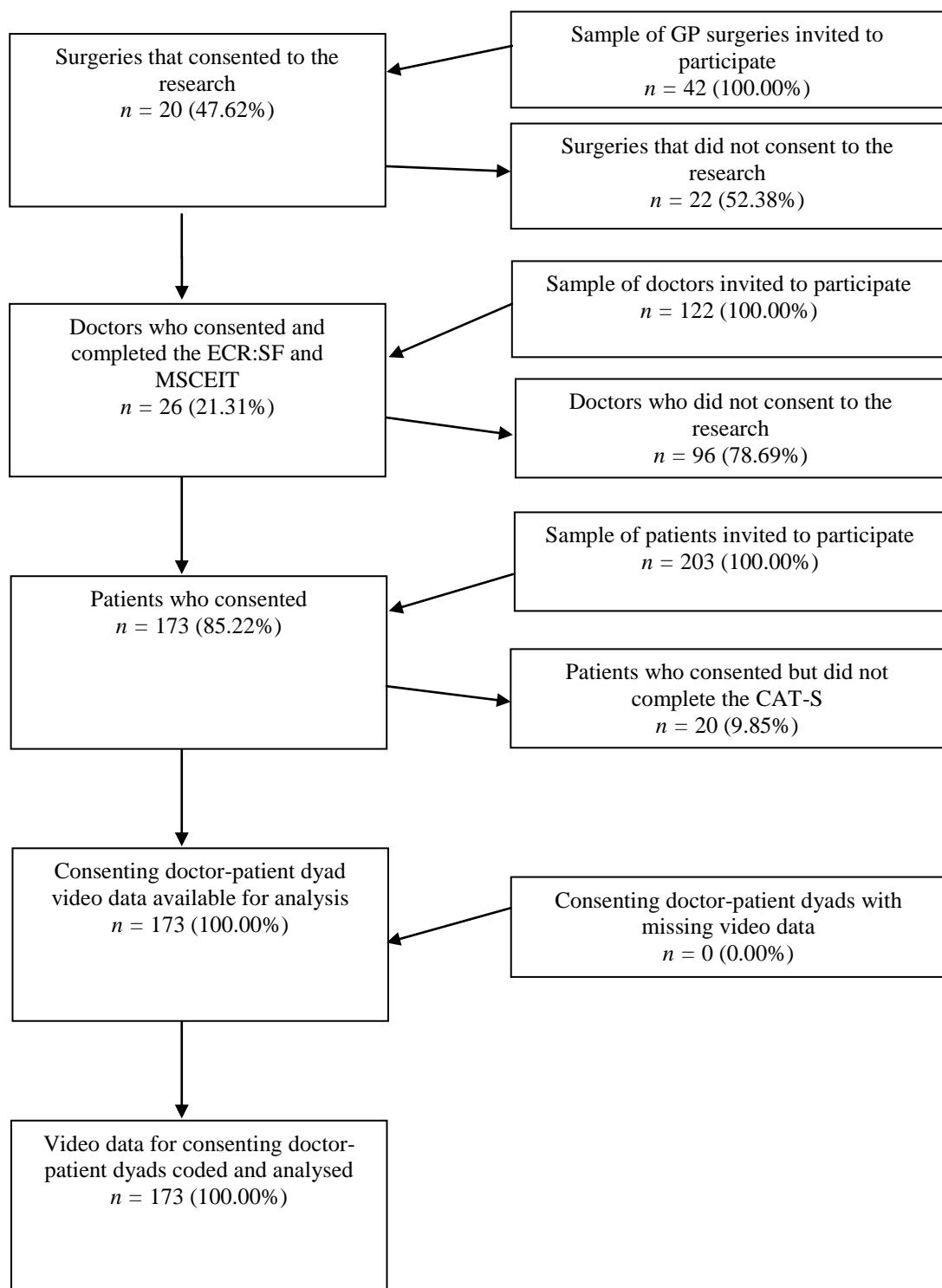
4.2.3 Doctor Characteristics

Five male doctors (19.23%) and 21 female doctors (80.77%) participated, with a mean age of 26.61 years (SD = 3.32, range 24 to 38). Twelve doctors (46.15%) had graduated from the University of Liverpool. The mean number of consultations per doctor was 6.65 (SD = 1.92, range 4 to 11). No demographic data were available for non-consenting doctors and therefore no analyses of the representativeness of the doctor sample could be conducted.

4.2.4 Patient Characteristics

Seventy four male (42.77%) and 99 female (57.23%) patients participated. The majority (37.72%) were aged between 25 and 44 years; approximately a third were aged 24 or younger (29.89%) with the remainder being aged over 45 (32.39%). The majority (77.32%) rated their health as good, very good or excellent. Most (64.89%) were visiting the junior doctor for the first time. The presenting complaint was deemed to be psychosocial in nature for 26 patients (15.03%) and physical for 147 patients (84.97 %). Mean consultation length was 17 minutes and 20 seconds (SD = 56.40 seconds). No demographic data were available for non-consenting patients and therefore no analyses of the representativeness of the patient sample could be conducted

4.3 Independent Variables

4.3.1 Doctors' Attachment Style

All 26 junior doctors completed the ECR:SF. Participants' attachment anxiety scores were higher than their attachment avoidance scores (M = 18.96, SD = 5.41 and M = 11.62 SD = 4.24 respectively); Figure 17, overleaf, plots the spread of attachment avoidance and attachment anxiety scores.

Figure 17

Attachment Avoidance and Attachment Anxiety Dimension Scores: Study 3
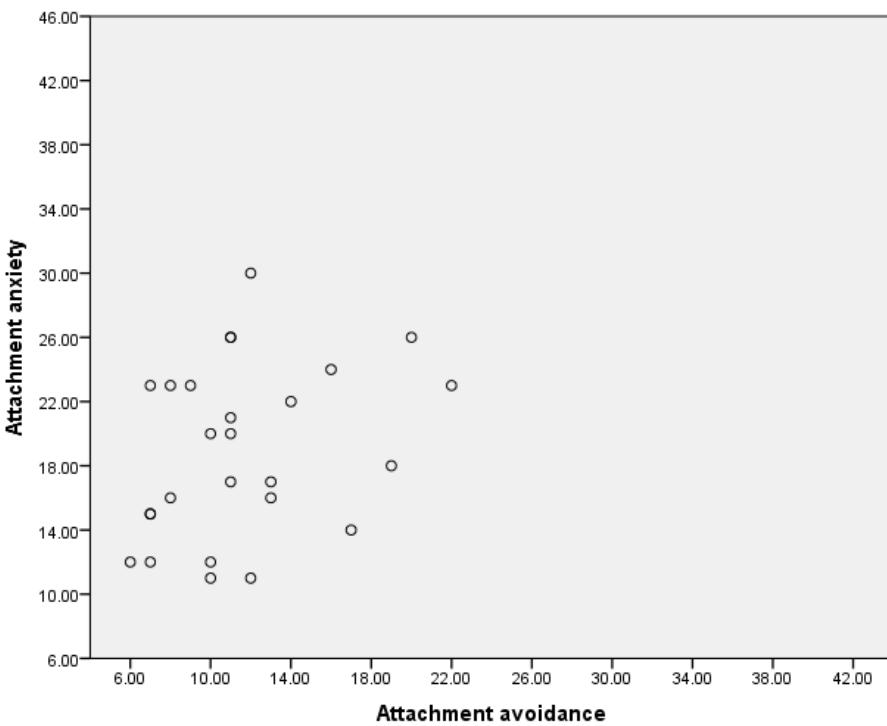
There were no significant differences between male and female doctors on either attachment avoidance ($t(24) = 1.42$, $p = .83$) or attachment anxiety ($t(24) = 1.66$, $p = .78$).

4.3.2 **Emotional Intelligence**

All 26 junior doctors completed the MSCEIT. Participants' mean total EI score was 101.89 ($SD = 15.44$). Table 37, overleaf, shows the mean score, standard deviation and range for MSCEIT scores.

Table 37

Mayer-Salovey-Caruso Emotional Intelligence Test Scores: Study 3

MSCEIT score	*M*	*SD*	Minimum score	Maximum score
Branch 1 (Perceiving Emotions)	93.30	13.89	66.96	122.91
Branch 2 (Facilitating Thought)	106.23	17.55	72.79	133.98
Branch 3 (Understanding Emotions)	108.41	12.46	83.03	130.79
Branch 4 (Managing Emotions)	103.92	13.51	80.16	124.82
Area 1 (Strategic EI)	96.45	15.74	71.72	130.55
Area 2 (Experiential EI)	107.24	11.17	89.09	135.90
Total EI	101.89	15.44	79.77	129.20

The majority of scores fell into the 'high average score' category (see Table 9 on page 99), with participants scoring lowest on Branch 1 (Perceiving Emotions) and Area 1 (Strategic EI). Table 38 shows the mean score, standard deviation and range for MSCEIT scores split by gender.

Table 38

Mayer-Salovey-Caruso Emotional Intelligence Test Scores Split by Gender: Study 3

MSCEIT score	Males (n=5) *M (SD)*	Females (n=21) *M (SD)*	*T*
Branch 1 (Perceiving Emotions)	84.94 (10.98)	95.28 (13.98)	1.54
Branch 2 (Facilitating Thought)	103.55 (16.76)	106.87 (18.07)	.37
Branch 3 (Understanding Emotions)	106.28 (8.19)	108.92 (13.39)	.42
Branch 4 (Managing Emotions)	97.41 (14.46)	105.47 (13.17)	1.21
Area 1 (Strategic EI)	88.73 (12.88)	98.29 (16.06)	1.23
Area 2 (Experiential EI)	101.92 (6.39)	108.51 (11.78)	1.20
Total EI	93.65 (10.83)	103.86 (15.92)	1.35

* = significant at $p < .05$,   ** = significant at $p < .01$,   *** = significant at $p < .001$

Female participants scored higher than male participants in all Branch, Area and Total scores but these differences were not statistically significant.

4.4   Dependent Variables

4.4.1   Verona Coding Definition of Emotional Sequences Data

4.4.1.1   Number of Cues

Overall, there were 392 cues and concerns[91], of which 345 (88.01%) were cues and 47 (11.99%) were concerns. The mean total number of cues per consultation was 2.33 ($SD = 3.86$) with number of cues ranging from 0 to 24. The median number of cues per interview was 1 ($n = 32$, 18.49%). 74.01% of consultations had less than 3 cues per interview, and 27.21% had more than 3 cues per interview. When all consultations were considered, no significant differences were found in the number of cues elicited per consultation relative to either junior doctor gender ($M = 2.40$, $SD = 1.21$ for male doctors and $M = 2.30$, $SD = 1.41$ for female doctors, $t = .15$, $p = .36$) or patient gender ($M = 1.92$, $SD = 4.11$ for male doctors and $M = 2.46$, $SD = 3.71$ for female doctors, $t = .85$, $p = .40$). Consultations with patients presenting with psychosocial complaints had significantly higher numbers of cues ($M = 5.02$, $SD = 4.64$) than those with patients presenting with physical health complaints ($M = 1.15$, $SD = 2.69$), $t(171) = 6.85$, $p = .00$). Seventy nine consultations (45.67%) contained no cues. The mean total number of cues per consultation in the 93 consultations where cues were presented was 4.20 ($SD = 4.32$), a significantly higher number than the 2.33 presented on average across all consultations. For these data, consultation length was divided into quartiles and the mean numbers of cues per quartile were compared (Table 39); there were no differences in number of cues as a function of consultation length ($F(3, 92) = 2.54$, $p = .62$).

Table 39

Mean Number of Cues by Consultation Length: Study 3

Consultation length	Mean number of cues (*SD*)
≤ 10 minutes 45 seconds	3.46 (5.13)
10 minutes 46 seconds - 17 minutes 20 seconds	3.61 (3.69)
17 minutes 21 seconds - 21 minutes 45 seconds	4.79 (5.40)
≥ 21 minutes 45 seconds	4.00 (4.23)

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[91] Hereafter collectively referred to as 'cues'

4.4.1.2   Responses to Cues

Individual responses to patients' cues are reported in Table 40.

Table 40

Junior Doctors' Responses to Patients' Cues: Study 3

Response category	Response	Frequency (total = 392)	% of total responses	% per category
Non-explicit/ Reduce space	Ignore	40	10.20	11.74
	Shutting down	3	.77	
	Non-explicit info advise	3	.77	
Explicit/ Reduce space	Switching	53	13.52	29.08
	Postponing	2	.51	
	Information advise	59	15.05	
	Active blocking	0	.00	
Non-explicit/ 'provide space'	Silence	10	2.55	13.27
	Back channel	1	.26	
	Acknowledge	26	6.63	
	Active invitation	14	3.57	
	Implicit empathy	1	.26	
Explicit/ 'provide space'	Content acknowledgement	19	4.85	45.92
	Content exploration	102	26.02	
	Affective acknowledgement	16	4.08	
	Affective exploration	39	9.95	
	Affective empathy	4	1.02	

Table 41, overleaf, gives frequencies and percentages of 'provide space' and 'affect focused' responses to cues.

Table 41

Junior Doctors' 'Provide Space' and 'Affect Focused' Responses to Patients' Cues: Study 3

Response Category	Frequency (N = 392)	% of total responses (SD)	Range (%)
'Provide space' responses	232	59.19 (32.71)	0.00 – 100.00
'Affect focused' responses	59	15.05 (27.92)	0.00 - 76.21

Mean proportion of 'provide space' responses for all participants was 59.19% (SD = 32.71), with a range from 0% to 100%. No significant relationship between junior doctor age and proportion of 'provide space' responses was observed (r = -.07, p = .67). No significant differences were found in mean proportion of 'provide space' responses based on either junior doctors' gender (M = 46.04, SD = 37.90 for male doctors and M = 47.16, SD = 37.55 for female doctors, $t(24)$ = .12, p = .61) or patients' gender (M = 48.13, SD = 41.58 for male doctors and M = 49.27, SD = 34.65 for female doctors, $t(24)$ = .13, p = .68). Junior doctors 'provided space' for further disclosure of emotive utterances more frequently in consultations with patients presenting with psychosocial complaints (M = 52.81, SD = 31.02) than in those with patients presenting with physical health complaints (M = 42.43, SD = 41.35) but this difference was not statistically significant ($t(92)$= 1.38, p = .17).

Mean proportion of 'affect focused' responses for all participants was 15.05% (SD = 7.92), with a range from 0% to 76.21%. No significant relationship between age and proportion of 'provide space' responses was observed (r = -.03, p = .79). female doctors provided more 'affect focused' responses than male doctors but this difference was not statistically significant (M = 7.24, SD = 6.79 for male doctors and M = 13.84, SD = 19.67 for female doctors, $t(92)$ = .73, p = .47). There was no difference in the proportion of 'affect focused' responses provided to male and female patients (M = 10.51, SD = 25.11 for male patients and M = 13.69, SD = 26.72 for female patients, $t(92)$ = -.54, p = .59). Junior doctors provided significantly more 'affect focused' responses to cues in consultations with patients presenting with

psychosocial complaints ($M = 20.65$ $SD = 28.09$) than in those consultations with patients presenting with physical health complaints ($M = 6.15$, $SD = 20.57$, $t(91)= 2.88$, $p = .01$).

4.4.2   Patient Satisfaction Data

Patient satisfaction data were available from 154 of the 173 patients (89.02%), of which 65 (42.21%) were male and 89 (57.79%) were female. The mean total patient satisfaction score was 71.42 ($SD = 6.47$, range 41 to 75), with the majority of patients ($n = 88$, 57.14%) rating the doctor as excellent on all items. There was no difference between male and female patients in terms of the proportion of 'excellent' ratings given ($\chi^2(1) = .36$, $p = .62$); female junior doctors were rated as 'excellent' more often than male doctors ($\chi^2(1) = 3.13$, $p = .03$). There was no difference between consultations with patients presenting with psychosocial complaints and those with patients presenting with physical health complaints in terms of number of 'excellent' ratings ($\chi^2(1) = .65$, $p = .72$). There was a trend for patients who presented cue(s) in their consultations to be more likely to rate the doctor as 'excellent' than those who did not (64.20% of ratings and 50.00% of ratings respectively), although this difference was not significant ($\chi^2(1) = 3.14$, $p = .07$).

4.5   Preliminary Exploratory Analyses

4.5.1   Relationships between Independent Variables

The relationships between junior doctors' attachment and EI were examined for the whole participant sample (Table 42, overleaf).

Table 42

Correlations between Attachment and Emotional Intelligence: Study 3

MSCEIT score	Attachment avoidance	Attachment anxiety
Branch 1 (Perceiving Emotions)	-.40*	-.17
Branch 2 (Facilitating Thought)	-.36	-.38
Branch 3 (Understanding Emotions)	-.30	-.03
Branch 4 (Managing Emotions)	-.12	-.22
Area 1 (Strategic EI)	-.39*	-.22
Area 2 (Experiential EI)	-.37	-.15
Total EI	-.43*	-.22

* = significant at $p < .05$,   ** = significant at $p < .01$,   *** = significant at $p < .001$

Significant negative correlations between attachment avoidance and Branch 1 (Perceiving Emotions), Area 1 (Strategic EI) and total EI scores were found. Attachment anxiety was not significantly correlated with any EI score.

4.5.2 Relationships between Dependent Variables

No significant differences were found in proportion of 'provide space' responses, proportion of 'affect focused' responses provided or numbers of cues presented between 'excellent' patient satisfaction consultations and 'non excellent' consultations. The dependent variables were therefore treated as independent outcome measures throughout subsequent analyses.

4.5.3 Investigation of the Potential Confounding Influence of Cues on 'Provide Space' and 'Affect Focused' Responses

The relationship between number of cues per minute and proportions of 'provide space' and 'affect focused' responses was examined; no significant relationships were observed between number of cues per minute and either proportion of 'provide space' responses ($r = .06$, $p = .84$) or proportion of 'affect focused' responses ($r = .08$, $p = .78$). However, positive (non-significant) correlations were noted between number of cues and proportions of 'provide space' and 'affect focused' responses. This indicated that cue elicitation was not negatively impacting on responses and therefore did not need further consideration in analyses.

4.6 Main Analyses

4.6.1 Research Question 1: What Influences do Junior Doctors' Attachment Styles and Emotional Intelligence have on the Number of Cues Presented by Patients?

A multilevel Poisson regression model was conducted to model the influence of patient characteristics on number of cues presented; backward selection was performed until a final patient-level model was obtained. Table 43, overleaf, shows the final Poisson model for significant patient-level explanatory variables. Section 3.2 of Appendix 6 contains the Stata output for the null model; Section 3.3 of Appendix 6 contains the Stata output for the final patient-level model.

Table 43

Two-level Poisson Model for Patient Level Explanatory Variables: Study 3

	Model 2: Final Patient-level model		**Model 1: Null model**	
	Coefficient	**Standard error**	**Coefficient**	**Standard error**
Fixed effects				
Patient-level				
Seen > once before	-1.27***	.23	-	
Psychosocial complaint	1.64***	.12	-	
Random effects				
Doctor-level				
Constant	.08	.16	.72	.12
Log of σ_u^2	-.98	.37	-1.37	.39
σ_u[92]	.61	.11	.51	.10
Log-likelihood	**-355.13**		**-518.23**	

* = significant at *p* <.05,   ** = significant at *p* <.01,   *** = significant at *p* <.001

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[92] σ_u is the standard deviation of the mixing distribution, i.e. the distribution of doctor-specific random intercepts

History with the doctor and type of presenting complaint both significantly influenced cue presentation and therefore were included in the final patient-level model. Patients who had been seen by the doctor more than once before presented 1.27 cues less per consultation than those who had not seen the doctor before; seeing the doctor *once* before did not significantly impact on cue presentation. Patients with a psychosocial health problem presented 1.64 more cues per consultation than those with a physical health complaint. Patients' self-reported health state, age and gender did not significantly influence cue presentation; thus were not included in the final patient-level model. The patient-level covariates included in the final patient-level model increased the variation in cue presentation between doctors (Model 1 σ_u = .51 (SE =.10), Model 2 σ_u = .61 (SE=.11)), accounting for 31.47% of the variance in cue presentation between patients (calculated using proportionate change in log likelihood[93]).

Number of cues was then modelled as a function of the characteristics collected for each doctor, which were entered collectively into the final patient-level model. Estimates for the multilevel Poisson model including attachment avoidance, attachment anxiety and total EI as doctor level covariates are presented in Table 44, overleaf. Section 3.4 of Appendix 6 contains the Stata output for the final patient-level and doctor-level model.

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[93]The log likelihood is the natural logarithm of the likelihood function which is maximized in order to obtain maximum likelihood estimates of the parameters or regression coefficients.

Table 44

Two-level Poisson Model with Doctor Level Covariates: Study 3

	Model 2: Final patient-level model		Model 3: Patient-level model with doctor-level EVs	
	Coefficient	**Standard error**	**Coefficient**	**Standard error**
	Fixed effects			
	Patient-level			
Seen > once before	-1.27***	.23	-1.36***	.24
Psychosocial presenting complaint	1.64***	.12	1.65***	.13
	Random effects			
	Doctor-level			
MSCEIT total	-		-.01	.01
Attachment avoidance	-		.07	.04
Attachment anxiety	-		-.11***	.03
Constant	.08	.16	1.93	1.59
Log of σ_u^2	-.98	.37	-.50	.40
σ_u	.61	.11	.78	.16
Log-likelihood	**-355.13**		**-344.69**	

* = significant at $p < .05$,   ** = significant at $p < .01$,   *** = significant at $p < .001$

Note: EVs = explanatory variables

Attachment anxiety was the only doctor-level explanatory variable significantly associated with cue presentation, with a decrease of .11 cues per one unit increase in attachment anxiety (p = .00). Neither total EI nor attachment avoidance significantly influenced cue presentation. Consideration of doctor-level explanatory variables in addition to the final patient-level explanatory variables further increased the variation in cue presentation between doctors (Model 2 σu = .61 (*SE* = .11), Model 3 σu = .78 (*SE* = .16)). The model accounted for an additional 2.94% of the variance in cue presentation between patients (calculated using proportionate change in log likelihood).

To assess the interaction between doctor-level characteristics and patients' presenting complaint, an interaction variable was calculated for attachment avoidance, attachment anxiety and total EI by multiplying each by the 'psychosocial' patient covariate[94]. These interaction variables were then entered collectively into Model 3. Estimates for Model 3 including the interaction variables as doctor level covariates are presented in Table 45, overleaf. Section 3.5 of Appendix 6 contains the Stata output for the final patient-level and doctor-level model including interaction terms.

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[94] An interaction variable is used to represent the interaction between two explanatory variables X1 and X2. The corresponding interaction variable is calculated as X1*X2. Once the main effects of X1 and X2 have been included in the model, the interaction term may be added to the model. If the interaction is not significant, then the effect of X1 on response Y does not vary significantly with X2. If the interaction is significant, then the effect of X1 on Y does vary significantly with X2. In this case, the interaction variables were calculated by multiplying the 'psychosocial' covariate by each of the independent variables.

Table 45

Two-level Poisson Model with Doctor Level Covariates and Interaction Variables: Study 3

	Model 2: Final patient-level model		Model 3: Patient-level model with doctor-level EVs and interaction terms	
	Coefficient	**Standard error**	**Coefficient**	**Standard error**
	Fixed effects			
	Patient-level			
Seen > once before	-1.27***	.23	-1.20***	.24
Psychosocial complaint	1.64***	.12	9.05***	1.68
	Random effects			
	Doctor-level			
MSCEIT total	-		-.05***	.01
Attachment avoidance	-		-.06	.05
Attachment anxiety	-		-.15***	.03
MSCEIT interaction term	-		.07***	.01
Avoidance interaction term	-		.23***	.04
Anxiety interaction term	-		.04	.03
Constant	.08	.16	7.89	1.81
Log of σ_u^2	-.98	.37	-.46	.39
σ_u	.61	.11	.80	.16
Log-likelihood	**-355.13**		**-318.06**	

* = significant at *p* <.05,   ** = significant at *p* <.01,   *** = significant at *p* <.001

Note: EVs = explanatory variables

Attachment anxiety was significantly negatively associated with cue presentation in patients presenting with a physical health problem, with a decrease of .15 cues per one unit increase in attachment anxiety ($p = .00$). The non-significant interaction term meant that there was no significant difference in effect of attachment anxiety between those presenting with psychosocial health problems and those presenting with physical health problems.

Inclusion of the interaction terms to Model 3 resulted in a significant positive association between EI and cue presentation, with an decrease of .05 cues per one unit increase in total EI ($p = .00$) in patients presenting with a physical health problem. The significant interaction term meant that there was a significant difference in the effect of total EI between those presenting with psychosocial health problems and those presenting with physical health problems, with an increase of .07 cues per one unit increase in total EI ($p = .00$) in patients presenting with psychosocial health problems compared with those presenting with physical health problems.

Attachment avoidance had no influence on cue presentation in patients presenting with a physical health problem but when the interaction terms were considered, attachment avoidance had a significant positive influence on cue presentation in patients presenting with psychosocial health issues, with an increase of .23 cues per one unit increase in attachment avoidance ($p = .00$) compared with those presenting with physical health problems.

Consideration of the interaction terms in addition to the doctor- and patient-level variables in Model 3 reduced the variation in cue presentation between doctors (Model 2 σu = .61 ($SE = .11$), Model 3 σu = .80 ($SE = .16$)). The model accounted for an additional 10.43% of the variance in cue presentation between patients (calculated using proportionate change in log likelihood).

4.6.2 Research Question 2: What Influences do Junior Doctors' Attachment Styles and Emotional Intelligence have on their Proportions of 'Provide Space' Responses?

As outlined in Section 3.9.2 of this chapter, 'provide space' data were not modelled and therefore no results will be presented for this research question.

4.6.3 Research Question 3: What Influences do Junior Doctors' Attachment Styles and Emotional Intelligence have on their Proportions of 'Affect Focused' Responses?

A multilevel linear regression model was conducted to model the influence of patient characteristics on proportions of 'affect focused' responses; backward selection was performed until a final patient-level model was obtained. Table 46, overleaf, shows the final model for significant patient-level explanatory variables. Section 3.6 of Appendix 6 contains the Stata output for the null model; Section 3.7 of Appendix 6 contains the Stata output for the final patient-level model.

Table 46

Linear Regression Model for Patient Level Explanatory Variables: Study 3

	Model 2: Final patient-level model		Model 1: Null model	
	Coefficient	**Standard error**	**Coefficient**	**Standard error**
	Fixed effects			
	Patient-level			
Age $\geq$ 85	100.36***	15.14	-	
Self-rated good health	11.38*	5.56	-	
Self-rated very good health	13.73*	6.77		
Psychosocial presenting complaint	23.24***	5.07	-	
	Random effects			
	Doctor-level			
	-		-	
Constant	-7.73	5.59	12.55***	3.50
σ_u	7.45		13.42	
σ_e	18.62		21.55	
ρ	.14		.28	
R^2 (within)	.40		.00	
R^2 (between)	.57		.00	
R^2 (overall)	**.48**		**.00**	

$*$ = significant at $p < .05$, $**$ = significant at $p < .01$, $***$ = significant at $p < .001$

Patient age, self-reported health state and type of presenting complaint all positively influenced proportions of 'affect focused' responses and therefore were included in the final patient-level model.

The estimate of rho[95] for the null model was .28, indicating that 28 % of the variation in proportion of 'affect focused' responses was due to variation between doctors. The estimate for rho changed to .14 in Model 2, indicating that 14% of the variation between doctors, as a proportion of the overall variation in the response, was left unexplained after having controlled for the significant patient-level explanatory variables.

Proportions of 'affect focused' responses were then modelled as a function of the characteristics collected on each doctor, which were entered collectively into the final patient-level model. Estimates for the linear regression model including attachment avoidance, attachment anxiety and total EI as doctor-level covariates are presented in Table 47, overleaf. Section 3.7 of Appendix 6 contains the Stata output for this model.

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[95] Rho is the intraclass correlation coefficient, i.e. the variation between doctors expressed as a proportion of the overall variation in the response

Table 47

Linear Regression Model with Doctor Level Covariates: Study 3

	Model 2: Final patient-level model		Model 3: Final patient-level model with doctor-level EVs	
	Coefficient	**Standard error**	**Coefficient**	**Standard error**
Fixed effects				
Patient-level				
Age ≥ 85	100.36***	15.14	95.96***	14.85
'Good' health	11.38*	5.56	8.29	5.37
'Very good' health	13.73*	6.77	11.72	6.53
Psychosocial complaint	23.24***	5.07	19.69***	5.05
Random effects				
Doctor-level				
MSCEIT total	-		.01	.23
Attachment anxiety	-		1.47**	.54
Attachment avoidance	-		-.13	.82
Constant	-7.73	5.59	-33.99	30.44
σ_u	7.45		10.04	
σ_e	18.62		16.87	
ρ	.14		.26	
R^2 (within)	.40		.49	
R^2 (between)	.57		.56	
R^2 (overall)	**.48**		**.51**	

* = significant at $p < .05$, ** = significant at $p < .01$, *** = significant at $p < .001$

Note: EVs = explanatory variables

Only attachment anxiety was a significant predictor of proportions of 'affect focused' responses; neither EI nor attachment avoidance significantly influenced 'affect focused' responses. The estimate for rho changed from .14 in Model 2 to .26 in Model 3, indicating that 26% of the variation between doctors, as a proportion of the overall variation in the response, was left unexplained after having controlled for the significant patient- and doctor-level explanatory variables. It is worth noting that inclusion of doctor-level variables increased the amount of variance in 'affect focused' responding left unexplained between doctors when compared to Model 2 (the patient-level model).

To assess the interaction between doctor-level characteristics and patients' presenting complaint, an interaction variable was again calculated for attachment avoidance, attachment anxiety and total EI by multiplying each by the 'psychosocial' patient covariate. These interaction variables were then entered collectively into Model 3. Estimates for Model 3 including the interaction variables as doctor-level covariates are presented in Table 48, overleaf. Section 3.9 of Appendix 6 contains the Stata output for this model.

Table 48

Linear Regression Model with Doctor Level Covariates and Interaction Terms: Study 3

	Model 2: Final patient-level model		Model 3: Final patient-level model with doctor-level EVs and interaction terms	
	Coefficient	**Standard error**	**Coefficient**	**Standard error**
	Fixed effects			
	Patient-level			
Age ≥ 85	100.36***	15.14	100.00***	15.03
'Good' health	11.38*	5.56	9.44	5.31
'Very good' health	13.73*	6.77	14.27*	6.81
Psychosocial complaint	23.24***	5.07	-16.61	51.90
	Random effects			
	Doctor-level			
MSCEIT total	-		-.08	.29
Attachment avoidance	-		-.04	1.02
Attachment anxiety	-		.32	.78
MSCEIT interaction term	-		.07	.38
Avoidance interaction term	-		1.59	1.02
Anxiety interaction term	-		.21	1.44
Constant	-7.73	5.59	-4.81	38.23

Table 48 continued

	Model 2: Final patient-level model	**Model 3: Final patient-level model with doctor-level EVs and interaction terms**
σ_u	7.45	5.82
σ_e	18.62	17.34
ρ	.14	.10
R^2 (within)	.40	.46
R^2 (between)	.57	.67
R^2 (overall)	**.48**	**.55**

* = significant at $p < .05$,   ** = significant at $p < .01$,   *** = significant at $p < .001$

Note: EVs = explanatory variables

Inclusion of the interaction term rendered attachment anxiety a non-significant predictor of proportion of 'affect focused' responses. However, the estimate of rho changed from .26 to .10 in Model 3, indicating that 10% of the variation between doctors, as a proportion of the overall variation in the response, was left unexplained after having controlled for the significant patient- and doctor-level explanatory variables (including the interaction terms).

4.6.4   **Research Question 4: What Influences do Junior Doctors' Attachment Styles and Emotional Intelligence have on Patients' Ratings of Satisfaction with the Patient-Provider Communication during their Consultation?**

A multilevel binary logit model was conducted to assess the influence of patient characteristics on patient satisfaction scores; backward selection was performed until a final patient-level model was obtained. No patient-level explanatory variables significantly predicted patient satisfaction scores and therefore no patient-level factors were included as covariates in the final model. Patient satisfaction scores were then modelled as a function of the characteristics collected on each doctor, which were entered collectively into the null model. Estimates for the multilevel binary logit model including attachment avoidance, attachment anxiety and total EI as doctor level covariates are presented in Table 49, overleaf.

Section 3.10 of Appendix 6 contains the Stata output for the null model; Section 3.11 of Appendix 6 contains the Stata output for the final patient- and doctor-level model.

Table 49

Two-level Binary Logit Model with Doctor Level Covariates: Study 3

	Model 1: Null model		Model 2: Patient-level model with doctor-level EVs	
	Coefficient	Standard error	Coefficient	Standard error
Fixed effects				
Patient-level				
	-	-	-	-
Random effects				
Doctor-level				
MSCEIT total	-		.01	.01
Attachment avoidance	-		-.05	.05
Attachment anxiety	-		-.04	.04
Constant	.34	.20	-2.88	4.16
Log of σ_u^2	-1.23	1.01	-2.87	4.16
σ_u	.54	.27	.23	.07
Log-likelihood	**-103.42**		**-100.46**	

* = significant at $p <.05$,   ** = significant at $p <.01$,   *** = significant at $p <.001$

Note: EVs = explanatory variables

No doctor-level explanatory variables were significantly associated with patient satisfaction scores. Consideration of doctor-level explanatory variables in addition to the final patient-level explanatory variables reduced the variation in cue presentation between doctors (Model 1 σu = .54 (*SE* = .27), Model 2 σu = .23 (*SE* = .07)). The model accounted for 2.86% of the variance in patient satisfaction scores between patients (calculated using proportionate change in log likelihood).

To assess the interaction between doctor-level characteristics and patients' presenting complaint, an interaction variable was calculated for attachment avoidance, attachment anxiety and total EI by multiplying each by the 'psychosocial' patient covariate. These interaction variables were then entered collectively into Model 2. Estimates for Model 2 including the interaction variables as doctor level covariates are presented in Table 50, overleaf. Section 3.12 of Appendix 6 contains the Stata output for this model.

Table 50

Two-level Binary Logit Model with Doctor Level Covariates and Interaction Variables: Study 3

	Model 1: Null model		Model 2: Patient-level model with doctor-level EVs and interaction terms	
	Coefficient	Standard error	Coefficient	Standard error
Fixed effects				
Patient-level				
Psychosocial complaint	-	-		
Random effects				
Doctor-level				
MSCEIT total	-		.01	.01
Attachment avoidance	-		-.05	.06
Attachment anxiety	-		-.05	.04
MSCEIT interaction term			-.00	.01
Avoidance interaction term			.04	.08
Anxiety interaction term			-.02	.09
Constant	.34	.20	.23	1.80
Log of σ_u^2	-1.23	1.01	-3.39	5.32
σ_u	.54	.27	.18	.49
Log-likelihood	**-103.42**		**-100.20**	

* = significant at $p < .05$,   ** = significant at $p < .01$,   *** = significant at $p < .001$

Note: EVs = explanatory variables

No doctor-level explanatory variables were significantly associated with patient satisfaction scores when the interaction terms were considered. Consideration of the interaction terms in addition to the doctor- and patient-level variables in Model 2 significantly reduced the variation in cue presentation between doctors (Model 1 σu = .54 (*SE* = .27), Model 2 σu = .18 (*SE* = .49)). The model accounted for 3.11% of the variance in patient satisfaction scores between patients (calculated using proportionate change in log likelihood).

4.7   **Summary of Results**

Junior doctors' attachment styles and EI were related to their PPC. Attachment anxiety significantly influenced negatively cue presentation in patients presenting with both physical and psychosocial health problems. It also significantly positively influenced proportions of 'affect focused' responses, but had no significant influence on patient satisfaction scores. Both attachment avoidance and total EI significantly positively influenced cue presentation in patients with psychosocial health problems; EI also negatively influenced cue presentation in patients with physical health problems. Neither EI nor attachment influenced patient satisfaction. Patient- and doctor-level explanatory variables explained 41.90%, 90.00% and 3.11% of the variance in cue presentation, proportions of 'affect focused' responses, and patient satisfaction scores between doctors respectively. No modelling was performed on 'provide space' data.

5 Discussion

5.1 Introduction

This section discusses the implications of the results, including how they stand alone as independent findings, how they relate to previously published literature and how they tie in both with the thesis' overall aim and with the findings of Studies 1 and 2. Doctors' and patients' demographic characteristics are discussed with reference to published literature to provide a context for interpreting the results of the research questions. The findings of each research question are then discussed. The strengths and limitations of the study are presented, and the chapter ends with the study's conclusions.

5.2 Context of Descriptive Characteristics

Whilst their attachment anxiety compared favourably, doctors displayed low levels of attachment avoidance (M = 11.62) in comparison both with the undergraduate samples in Studies 1 and 2 and with published studies of doctors in General Practice (Salmon et al., 2007, Salmon et al., 2008, Fenton, 2008). Incongruent with results of a large meta-analysis investigating gender differences in adult attachment (Del Giudice, 2011), no gender differences were observed between males and female doctors. Whilst this may in part be due to the small, predominantly female self-selected sample; discussed further in Section 6 of this chapter, the potential lack of generalisability of doctors' attachment styles should be considered when interpreting the results.

Doctors' mean total MSCEIT scores (M = 101.89, SD = 15.44) indicated a level of EI appropriate for their age and developmental stage (Mayer et al., 2009), comparing favourably with other published literature reporting on similar samples (Brannick et al., 2009). Scores fell within the recommended range for the general population, falling into the 'high average' category of interpretation (Mayer et al., 2009). The observed gender differences, although not significant due to the small number of male participants, support both the findings of Studies 1 and 2 and the notion that females demonstrate greater levels of emotional competency than males (Mayer et al., 2002, Carrothers et al., 2000, Todres et al., 2010, Austin et al., 2005, Austin et al., 2007). Whilst some researchers argue for an inherent MSCEIT bias

towards females (Lewis et al., 2005), the consistency of these findings with results from studies using other measures of EI (Weng, 2008, Weng et al., 2008, Weng et al., 2011a, Weng et al., 2011b, Weng et al., 2011c) supports the notion of gender differences in individuals' EI, specifically their ability to perceive, understand and use emotion.

As with Studies 1 and 2, and previous literature (Kafetsios, 2004), negative moderate correlations were found between attachment avoidance and all scales of EI, irrespective of gender. This indicates a negative relationship between attachment avoidance and the ability to perceive emotions, use emotions to facilitate thinking and understand and manage emotions. Interestingly, and in contrast to Study 1, no significant association was observed between Branch 4 (managing emotions) and attachment avoidance, indicating that relationships between attachment avoidance and higher level, molar EI skills may be limited to individuals with less well-developed EI. Consistent with the findings of Studies 1 and 2, weak correlations were observed between attachment anxiety and EI; whilst similar in strength and direction, these were non-significant, probably due to the small doctor sample size.

Variation existed at the patient level in the current study, in contrast to Studies 1 and 2, where 'patients' were standardised. This allowed for assessment of the influence of doctors' attachment styles and EI on their PPC with a range of patients, each presenting with different health issues and each with different preferred levels of patient involvement. Whilst rendering standardisation impossible between doctors, the high patient consent rate (85.22%) and number of, and diversity in, surgeries from which they were recruited, indicated that the range of patients studied was representative of those presenting to General Practice surgeries in Merseyside. The varied patient sample also allowed for analysis of the influence of patient-level and doctor-level characteristics on cue presentation; something which was not possible in Studies 1 and 2.

Patients presented at least one cue of emotional distress in 54.33% of consultations, echoing previous literature (Robinson and Roter, 1999, Marvel et al., 1999, Levinson et al., 2000, Salmon et al., 2004). An average of 2.33 cues were presented per consultation, corroborating previous findings (Zimmermann et al., 2007, Levinson et al., 2000, van Dulmen and van den Brink-Muinen, 2004, Street et

al., 2005, Del Piccolo et al., 2007, Bensing et al., 2008). There were no significant differences in the numbers of cues presented in the shortest 25% of all consultations[96] and the longest 25%[97] of all consultations. This is probably because whilst GP consultations are between 7 and 10 minutes on average (Deveugele et al., 2002), junior doctors in the current study did not have a finite time to complete their consultations; rather they were informed to consult until they felt that they had adequately elicited and responded to the patient's main health concerns. However, of note is that the mean of 2.33 cues per consultation includes data from all consultations. When consultations containing no cues were excluded from analysis, the mean number of cues rose to 4.20 cues, indicating that doctors have more opportunities within some consultations to acknowledge and respond to cues than the mean across all consultations might suggest, whilst other consultations present no opportunity.

Patients' presenting complaints were psychosocial in nature for only 15.03% of patients, despite General Practice surgeries currently providing the main referral pathway into adult psychiatric services (National Institute of Health and Clinical Excellence, 2013). However, cues were presented in over half of consultations (54.33%), supporting the notion that doctors need to be able to correctly identify and respond to such cues in order to be able to treat patients' underlying emotional difficulties (cf Chapter 1). Junior doctors' responses 'provided space' for further discussion of cues on 59.19% of occasions. Of these responses, 15.05% related to the affective element of the cue, and 30.87% of responses were to acknowledge or enquire more about the content of the cue rather than its affective element. The latter proportion is similar to that observed in other published literature relating to primary care (Mjaaland et al., 2011). These data indicate a tendency for junior doctors to acknowledge and enquire about patients' cues and are encouraging in light of the positive patient benefits associated with effective PPC of emotive issues (outlined in Chapter 1).

Similar to other published literature (Hick, 2009, Atherton et al., 2009), approximately one quarter (23.72%) of doctors' responses either ignored the cue or switched its frame of reference, indicating an awareness of the cue's presence by

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[96] Consultations less than or equal to 10 minutes 45 seconds in duration ($n = 23$)
[97] Consultations greater than or equal to 21 minutes and forty five seconds in duration ($n = 23$)

acknowledging it but neglecting to allow the patient to further discuss the emotion. Such strategies ensure that the consultation remains doctor-led and may reflect a doctor's discomfort with emotive discourse. It was not possible, however, to ascertain whether doctors used ignoring or switching as a deliberate means of avoiding emotive discourse, as suggested by previous literature (Maguire et al., 1996a, Wilkinson, 1991) or as a conscious attempt to prioritise patients' medical complaints (Girón et al., 1998). This may be due to worries that responding to emotion may increase consultation length, despite data indicating that adequate responding to cues actually *decreases* consultation length (Levinson et al., 2000).

Irrespective of this, patients were generally satisfied with the PPC in their consultation, with 57.14% rating the junior doctor as 'excellent' on all 15 CAT-S items. Whilst this proportion is slightly lower than that reported in previous literature (Makoul et al., 2007), encouragingly, no patients rated their doctor's PPC as less than 'good' on any one CAT-S item. Interestingly, there was a trend for patients to rate their doctor as 'excellent' more often in consultations in which one or more cues were expressed than in consultations with no cues, although this difference was not significant. This indicates that patients experiencing emotional distress may place more value on effective PPC than those not. Although the reasons for this are unclear, relationships have been reported between patient-level characteristics such as patients' gender (Millar, 2001, Baker, 1996), age (Baker, 1996, Millar, 2001, Branson et al., 2003), nature of presenting complaint (Drury et al., 1988) and health status (Millar, 2001, Jung et al., 2003) and their satisfaction with their GP consultation. However, the current study found none of the above to significantly predict patients' satisfaction with the PPC in their consultation, indicating the role of other factors in influencing patients' satisfaction, such as attitudes and expectations (Cousin et al., 2012, Shay et al., 2012).

Also worthy of noting is that approximately two thirds of patients (64.89%) were visiting the junior doctor for the first time, probably because each junior doctor had been in post for only 3 months at the time of participation. Research into the influence of continuity of care on patient-level outcomes is mixed. Some indicates positive associations with patient enablement, patient satisfaction (Howie et al., 1999, Baker, 1996, Hjortdahl and Laerum, 1992) and patient compliance and

accuracy of diagnosis (Freeman and Richards, 1994, Guthrie, 2000, Ettinger and Freeman, 1981). Others report no differences in provision of psychosocial or biomedical information as a function of doctor-patient familiarity, concluding that effective PPC enables familiar and non-familiar patients to feel at ease and discuss issues freely (Jabaaij et al., 2008). Whilst no differences in patient satisfaction scores were found in the current study between patients who had seen the junior doctor before and those who had not, familiarity was included as a patient-level covariate in subsequent multi-level analyses so as to control for its possible influence.

5.3   Overall Summary of Variables

The findings above provide a context for interpreting the results of the research questions. The next section discusses the findings of the research questions with relation to the aim of the study: to explore the relationships between attachment style, EI and PPC in a postgraduate junior doctor sample consulting in General Practice.

5.4   Research Question 1: What Influences do Junior Doctors' Attachment Styles and Emotional Intelligence have on the Number of Cues Presented by Patients?

After controlling for significant patient-level explanatory variables, doctors' attachment anxiety was significantly associated with patients' cue presentation, with a decrease of .11 cues per one unit increase in attachment anxiety. Whilst this decrease may seem small, it translates, hypothetically, into doctors with an attachment anxiety score of 20 eliciting 1.2 cues less per consultation than those with an attachment anxiety score of 10. These findings corroborate data indicating doctors' attachment anxiety is related to patients' frequency of psychosocial cue emission. Dozier (1994) found relationships between levels of intensity when intervening with clients and case workers' preoccupied attachment styles (characterised by low attachment avoidance and high attachment anxiety). Similarly, Salmon and colleagues (2008) discuss the negative relationships between GPs' attachment anxiety (referred to as 'negative model of self') and their likelihood of proposing somatic interventions, hypothesising that these GPs may feel that they have little to offer interpersonally in such situations. It is possible that doctors high in attachment anxiety elicited fewer cues from patients than those lower in

attachment anxiety due to adopting more intense lines of questioning when initially presented with cues. This may have resulted in less chance of patients re-presenting cues (Del Piccolo et al., 2000, Zandbelt et al., 2007). This is supported by theory: attachment anxiety is characterised by hyper activation of affect regulation strategies, in which the individual overreacts to negative feelings in order to gain support from others. Adoption of intense lines of questioning, behaviour typical of individuals high in attachment anxiety, may therefore reduce cue presentation. Interestingly, no differences were found in the effect of attachment anxiety on cue presentation between patients presenting with psychosocial health problems and those presenting with physical health problems, indicating a standardised approach to cue responding regardless of patients' presenting complaints.

Whilst attachment avoidance had no influence on cue presentation in patients presenting with a physical health problem, it significantly positively influenced cue presentation in patients presenting with psychosocial health issues, with an increase of .23 cues per one unit increase in attachment avoidance when compared to patients with physical health problems. Again, whilst this increase may seem small, it indicates, hypothetically, that doctors with an attachment avoidance score of 20 are presented with 2.3 more cues per consultation than those with an attachment avoidance score of 10. The relationship between attachment avoidance and number of cues presented by patients with psychosocial health issues supports the work of Salmon (2008). Interactions between junior doctors and patients presenting with physical health problems may be less emotionally demanding for the junior doctor than those prompted by patients presenting with psychosocial health issues. Through this mechanism, patients presenting with physical health problems may prompt "automatic" responses to dialogue, without activation of attachment processes (Salmon et al., 2008). However, the attachment mechanism is thought to be activated in consultations characterised by psychosocial discussion, such as those typical of patients presenting with psychosocial health complaints (Salmon et al., 2008). Doctors high in attachment avoidance may therefore adopt strategies to withdraw from the doctor-patient interaction when presented with cues of emotion from patients presenting with psychosocial health issues. When primed in this manner, they may demonstrate less intensive and more evasive responses to cues, hence resulting in re-presentation of cues from this patient group only. This notion is

in-keeping with the findings of Del Piccolo (2000), who suggests that cue frequency may be a result of doctors' attributions of patients' psychosocial distress, rather than an antecedent.

Total EI had a negative influence on cue presentation in patients presenting with a physical health problem, with a decrease of .05 cues per one unit increase in total EI. EI may therefore be positively related to ability to assess appropriateness of response; doctors with high EI may realise when it is appropriate to enquire about emotion and when, instead, to pursue a purely biomedical agenda in line with the patients' needs, thus reducing their cue presentation.

Interestingly, total EI significantly positively influenced cue presentation in patients presenting with psychosocial health issues, with an increase of .07 cues per one unit increase in total EI. Doctors with high EI may therefore be better able to identify patients' psychological distress, and thus elicit more cues than their less able counterparts in patients with psychosocial health complaints (Goldberg et al., 1993, Davenport et al., 1987). They may also be more likely to use facilitatory behaviours when interacting with patients showing emotional distress, which have been shown to increase cue presentation in patients with psychological health problems (Goldberg et al., 1993).

It is important to note that factors such as patients' levels of embarrassment or fear regarding voicing cues (Del Piccolo et al., 2008, Little et al., 2001b), stress levels (Hulsman et al., 2009, Neumann et al., 2007), presenting complaints and beliefs about the value of cue disclosure (Del Piccolo et al., 2000, Del Piccolo et al., 2007, Robinson and Roter, 1999) and doctors' antecedent and subsequent speech (Epstein et al., 2007, Eide et al., 2004b) have all been shown to influence cue presentation. Whilst this study considered the influence of some patient-level characteristics, such as health state, gender, age, nature of presenting complaint and familiarity with the doctor, it is possible that consideration of some of the factors outlined above may alter the influence of attachment styles and total EI on cue presentation. It is therefore important to stress the preliminary nature of this study when interpreting these findings.

5.5   Research Questions 2 and 3: What Influences do Junior Doctors' Attachment Styles and Emotional Intelligence have on their Proportions of 'Provide Space' and 'Affect Focused' Responses?

Due to the distribution of the data, analyses were not conducted to assess the influence of attachment and EI on proportion of 'provide space' responses (see Section 6 of this chapter for a discussion of the limitations of this decision). However, it was possible to model 'affect focused' responses and therefore draw some preliminary conclusions regarding the influence of doctors' attachment styles and EI on their responses to patients' cues. Attachment anxiety was a significant predictor of proportion of 'affect focused' responses; high attachment anxiety was associated with a greater chance of providing space for further discussion of patients' cues by focusing on their affective element, irrespective of the nature of patients' presenting complaints. Given that high attachment anxiety is characterised by a habitual preoccupation and over-involvement in close relationships (Collins and Feeney, 2000), it is unsurprising to see attachment anxiety associated with greater frequency of 'affect focused' responses. Doctors scoring high on attachment anxiety may feel emotionally 'over-involved' in the consultation and therefore feel the need to explore a greater proportion of cues by referring to their affective components than those scoring low on attachment anxiety (as discussed in Section 5.4 of this chapter).

'Affect focused' responses 'provide space' for further disclosure of emotional distress and may therefore aid detection of patients' underlying psychological health problems (Arborelius and Österberg, 1995, Del Piccolo et al., 2000, Goldberg et al., 1993). Viewed from this perspective, these results indicate that high attachment anxiety may be a positive attribute for doctors to have. However, if a doctor merely enquires about the affective component of a cue without gaining further information about its biomedical correlates, then they are unlikely to be able to adequately assist patients in dealing with the emotional aspects of their health. A large proportion of 'affect focused' responses, whilst undoubtedly a significant part of effective PPC, represents only one skill within a wide spectrum of PPC skills necessary for the satisfactory delivery of all key aspects of the consultation – from eliciting the reason for the visit, to drawing the consultation to a close (de Haes and Bensing, 2009). In this respect, high attachment anxiety may not

be a positive attribute as it may 'blind' the doctor to additional responses to, or elements of, patients' cues. However, it remains to be seen whether these findings are generalisable to a larger, more representative doctor-patient cohort.

Neither attachment avoidance nor EI significantly influenced proportions of 'affect focused' responses, supporting the findings both of Studies 1 and 2 and those of other published research (Hick, 2009, Atherton et al., 2009), albeit conducted in a simulated and assessed setting. It is also important to note that whilst patient- and doctor-level explanatory variables collectively reduced the variance in doctors' proportions of 'affect focused' responses by 90%, only a small proportion of this variance was explained by doctors' attachment styles and EI. This indicates the significant influence of patient-level characteristics, such as age, health state and presenting complaint, on doctors' 'affect focused' responses to cues (Street, 1991, Street, 1992). Clearly, more research is needed to explore this further.

5.6   Research Question 4: What Influences do Junior Doctors' Attachment Styles and Emotional Intelligence have on Patients' Ratings of Satisfaction with the Patient-Provider Communication in their Consultation?

Neither attachment styles nor EI significantly predicted patients' ratings of satisfaction with the PPC in their consultation, together accounting for only 3.11% of the variance in patients' ratings.

No published research has directly investigated the influence of doctors' attachment styles on patient satisfaction, specifically patients' ratings of PPC. The most relevant data come from Hick (2009), who found no relationships between fourth-year medical students' attachment styles and simulated patients' ratings of their PPC. These data, when taken in conjunction with data from the current study, indicate that doctors' attachment styles may not influence patients' ratings of the effectiveness of, or appropriateness of, doctors PPC. However, it must be noted that the attachment avoidance scores of the current cohort were lower than those reported in other published research, which may influence the generalisability of the current study's findings.

From a *theoretical* standpoint, doctors' high total EI should translate into increased patient satisfaction with PPC. This is because individuals with high total EI are better able to identify and respond to the emotions of others, which is an important component of PPC (Winefield et al., 1995). Furthermore, individuals with high EI are better able to accurately identify and decode others' body languages; in doctors; this has been found to result in higher patient satisfaction ratings (Weng, 2008, Wagner et al., 2002, Weng et al., 2011b, Weng et al., 2011c). The five domains of EI described by Brewer and Cadman (2000) also map onto factors associated with patient satisfaction, including sensitivity to patients' concerns and provision of reassurance and support. However, whilst the relationship between EI and patient satisfaction has been well-studied (Weng, 2008, Wagner et al., 2002, Weng et al., 2011b, Weng et al., 2011c), such studies report inconclusive and contradictory findings (see Chapter 3 for an overview of this literature). Heterogeneity in sample sizes and in measures of both EI and patient satisfaction limit the conclusions that can be drawn from such research (Weng, 2008, Wagner et al., 2002).

The findings of this study do not bring clarity to the relationship between EI and patient satisfaction; doctors' EI did not significantly predict patients' ratings of satisfaction with the PPC in their consultation. The specificity of EI must be considered as one possible explanation for the lack of significant findings. It is unclear to what extent a doctor's EI is 'domain-specific' or 'context-specific' (Weng et al., 2011b). For example, EI may assist an individual to manage their own emotions in high-pressure, stressful situations (such as OSCEs) but may be less influential in less stressful patient-doctor consultations within General Practice. This notion has not yet received much research interest, possibly given the relatively recent application of EI to the study of providers' interpersonal behaviours. However, it would be a useful avenue for further research and one that would allow further clarification of the role of EI in medicine, specifically with relation to its influence on patient satisfaction.

The subjective nature of patient satisfaction must also be considered when interpreting these data; a number of intrinsic and extrinsic factors relating to the patient-doctor relationship influence patients' satisfaction with the PPC in their

consultation (Epstein, 2006). These often occur irrespective of the actual PPC being rated. For example, satisfaction is influenced by doctors' availability and time keeping (Wright et al., 2004) and by factors related to the specific General Practice surgery, including the practice size (Baker, 1996). It is possible that the CAT-S was not specific enough to differentiate between doctors, despite being validated for use as a binary response variable (Makoul et al., 2007). However, other factors not measured in this study may have had greater predictive validity and therefore have a greater impact on patients' satisfaction than doctors' attachment or EI, posing one explanation for the lack of significant findings with respect to this research question.

6 Methodological Strengths, Considerations and Possible Limitations

This section will discuss the strengths and possible limitations unique to the Study 3. A discussion of the strengths and limitations common to all three studies reported in this thesis is presented in Chapter 7, along with a discussion of their overall methodological considerations. These will therefore not be discussed in detail in this section to avoid repetition.

The current study is the first to explore the relationships between attachment styles, EI and PPC in a postgraduate junior doctor sample consulting in a clinical setting. Its first strength is therefore in the precision of baseline data and the triangulation and further investigation of the findings of Studies 1 and 2. However, several limitations must be considered. The first relates to sample size and response rate. A priori sample size calculations were performed to determine the number of participants necessary for adequate statistical power. However, for practical reasons, recruitment was halted after 16 months of data collection, resulting in a final Level 2 sample size of 26 and Level 1 sample size of 173. A sample size lower than the recommended 30/30 (i.e. 30 at Level 2 each consulting with 30 at Level 1, cf Hox, 1998, Maas and Hox, 2004) may have reduced the prevision of some of the models, particularly given that some were conducted only on data from the 93 participants presenting with cues. Whilst the study was an exploratory pilot study designed to provide data regarding the influence of doctors' attachment styles and EI on their PPC, the small sample size should be considered a limitation of the study.

Furthermore, the self-selecting nature of the cohort may also limit the generalisability of the findings. Whilst participants in Studies 1 and 2 were

representative of undergraduate medical students at the University of Liverpool in terms of their age, gender and ethnicity, a disproportionate number of White British and female doctors participated in Study 3. Similarly, the lower than average attachment avoidance scores observed in the cohort suggest that doctors who score low on attachment avoidance may be more likely to participate in such a study than those scoring high on attachment avoidance. The findings of Study 3 may therefore be more generalisable to a female, White British doctor sample than to other samples.

In addition, no demographic data were collected about non-consenting doctors or patients and therefore it was not possible to examine differences in characteristics or presenting complaint between consenting and non-consenting patients. Non-consenting patients may have had more complex symptoms or provided more challenging presentations than those who consented, although the high patient response rate (85.22%) allows for confidence in the representativeness of the patient sample.

Also, doctor and patient recruitment was constrained by being limited to those placed at or attending consenting General Practice surgeries. Whilst diverse in their locations' levels of socioeconomic deprivation, it is possible that non-consenting surgeries may have had a different demographic of patient and therefore consideration of a larger surgery pool may change the findings and conclusions of this study. This should be considered a limitation.

The final limitation relates to the analyses performed. First, patients' presenting complaints were categorised as being psychosocial or else physical in nature through the opinion of the author, with a sample validated by participating junior doctors. This process adds subjectivity to the categorisation and may result in problems when comparing the findings of the current study with those of other studies. Second, the increase in σu (measure of how much variation is left unexplained) from the null model to the final patient- and doctor-level model for research question 1 implies that the model was ill conditioned; i.e. the mixing distribution for random effects available in Stata, namely the Gaussian and Gamma distributions, were not able to adequately model the shape of the distribution. In particular, the bimodal nature of the distribution (which had local maximum peaks at

0 cues and 8 cues) proved problematic. Whilst the models were convergent and significant, the results must therefore be treated with caution. It is recommended that researchers consider some of the modelling approaches discussed by Ridout, Clarice and Hinde (1998) if faced with the same data. Finally, the decision was made not to model 'provide space' responses using an ordered logit model, in part because this model makes an assumption of proportionality; i.e. it assumes that the odds ratios across the three partitions are the same. Whilst there was indeed little variation in the odds ratios from one partition to another, this limitation, coupled with the loss of precision associated with categorisation of data and the small number of participants with data available for modelling, meant that this modelling approach was not considered suitable for these data. This is a limitation of the analyses and should be addressed in future research.

7   Conclusions

Although exploratory in nature and limited by its relatively small sample size, Study 3 provided preliminary data in support of the findings of Studies 1 and 2, namely that providers' attachment styles and EI are related to their PPC. Contrary to the medical student data, but in line with other research (Salmon et al., 2008), doctors' attachment anxiety was the more influential predictor of PPC and was significantly associated with both patients' cue presentation and with doctors' proportions of 'affect focused' responses. Both attachment avoidance and EI significantly influenced cue presentation in patients presenting with psychosocial health problems; EI also negatively influenced cue presentation in patients presenting with physical health problems. No doctor-level variable predicted patients' satisfaction with their PPC. This is contrary to literature indicating the influence of EI on patient satisfaction (Weng, 2008, Weng et al., 2011a, Weng et al., 2011b, Weng et al., 2011c, Wagner et al., 2002). The patient- and doctor-level explanatory variables considered in Study 3 accounted for a large proportion of the variance in both cue presentation and proportions of 'affect focused' responses (41.90% and 90.00% respectively), but not in patient satisfaction scores.

Given that the study was an exploratory pilot study and given its limitations (discussed in Section 6 of this chapter), results should be considered preliminary. Nonetheless, the results of this study, when combined with those of Studies 1 and 2,

provide important data with implications for both research and practice. Part 3 of the thesis, reported next, is dedicated to critically interpreting the thesis' combined findings, with specific reference to these implications.

Part 3: Critical Interpretation of the Findings

Introduction

Part 1, which comprised three chapters, located the field of enquiry. In Chapter 1, the notion of PPC was introduced and problematised in terms of individual differences in providers' PPC, specifically their responses to patients' emotive cues. In Chapter 2, the theoretical frameworks of the research were introduced: attachment theory and EI. Chapter 3 explored the current position of the literature regarding medical students' and doctors' attachment style, EI and PPC. The overarching research question addressed within this thesis was then introduced: What influences do medical students' and doctors' attachment styles and EI have on their PPC - and, more specifically, their PPC with patients showing signs of emotional distress?

Part 2, the empirical component, comprised the following three chapters:

- Chapter 4: Study 1: Exploring the influence of first-year medical students' attachment styles and EI on their PPC

- Chapter 5: Study 2: Exploring the influence of second-year medical students' attachment styles and EI on their PPC

- Chapter 6: Study 3: Pilot study exploring the relationships between junior doctors' attachment styles, EI and PPC

In Chapters 4, 5 and 6, the relevant methodological approaches and considerations were firstly described, including discussion of the measures and covariates employed in each study. Each chapter then presented its carefully considered data analysis plan and its resulting empirical findings, and then discussed these in light of previous empirical and theoretical literature. Conclusions were drawn at the end of each study to provide context for interpretation of subsequent chapters.

Part 3 is dedicated to critical interpretation and discussion of these findings. Chapter 7 reflects on the strengths, possible limitations and methodological considerations of the empirical work, and discusses the rigour of the studies and generalisability of their findings. The eighth, and final, chapter discusses the thesis' main findings further and proposes the arising recommendations for research and

practice. It then concludes the thesis by drawing conclusions from its findings in light of these research and practice recommendations.

Chapter 7: Methodological Considerations, Strengths and Possible Limitations

1 Introduction

The previous three chapters, contained within Part 2, outlined the findings of the thesis' empirical component, and concluded that attachment styles and EI influence PPC in the medical student and doctor samples studied. Prior to discussion of the implications arising from this work, it is important to consider the strengths and limitations of the methods adopted and measures used throughout this empirical work. This chapter will critically discuss the methodology and choice of measures common to all three studies (see Chapters 4, 5 and 6 for discussion of limitations uniquely pertaining to each study). Only discussion of factors thought to substantively influence the data collected or conclusions drawn from the thesis will be discussed here for brevity.

2 Methodological Considerations, Strengths and Possible Limitations

2.1 Use of the Experience in Close Relationships: Short Form to Assess Attachment

Several studies have investigated the relationships between medical students' or doctors' attachment styles and their PPC, but attachment styles have generally been determined using categorical measures of attachment (Hick, 2009, Atherton et al., 2009). This approach has been criticised for failing to consider individual differences within attachment categories (Mikulincer and Shaver, 2007, Daniel, 2006). A measure designed to assess attachment dimensionally (Wei et al., 2007) was used throughout this thesis, thus providing greater sensitivity to differences in attachment styles than classification into categories. It is likely that future research will apply dimensional measures of attachment to a medical population, and this was a key factor in the choice of the ECR:SF to measure attachment. This choice puts this thesis at the forefront of methodological thinking and, together with the provision of baseline data, represents a significant contribution to the field of enquiry.

However, use of the ECR:SF made comparison of attachment data with that of other published research in a medical population difficult. Whilst findings from

measures designed to be assessed categorically could be extrapolated and compared to those of the current thesis, lack of published data using the ECR:SF made certainty regarding generalisability of findings difficult. Additionally, the ECR:SF was developed primarily to assess attachment in close romantic relationships; applicability of attachment theory to the patient-provider relationship, whilst theoretically supported, has not yet been validated using this measure.

Also, attachment avoidance and attachment anxiety were considered as separate variables throughout the analysis. This decision was made based on a number of theoretical and practical considerations; the ECR:SF's authors recommend treating each dimension as conceptually distinct (Wei et al., 2007) and analyses confirmed the limited overlap between the dimensions throughout the three studies in this thesis. However, this approach is at odds with traditional social psychology conceptualisations of adult attachment, in which individuals are assigned to a theoretical prototype based on their attachment dimension scores (Bartholomew and Horowitz, 1991). Considering attachment avoidance and attachment anxiety as distinct dimensions of adult attachment fails to consider attachment styles as a global entity and therefore may reduce the comparability of the findings from this thesis with other, categorical, published research.

Finally, it has been argued that adult attachment may not be reliably measured using self-report tools (Shaver et al., 2000), as used throughout this thesis, although this has since been disputed (Bartholomew and Moretti, 2002). Conducting in-depth attachment interviews with participants was beyond the scope of this thesis but may have provided additional data regarding the relationship between adult attachment styles and PPC above and beyond those obtained from the self-report ECR:SF. Consideration of other measures to quantify adult attachment may therefore have resulted in different data and conclusions than those of the current thesis. The reader should bear this in mind when interpreting the findings.

2.2 Use of Mayer-Salovey-Caruso Emotional Intelligence Test to Assess Emotional Intelligence

Throughout the thesis, the MSCEIT was used to measure participants' EI. The MSCEIT is based on the assumption that EI is an ability based upon specified emotion processing skills (cf Section 3.6.1.2 of Chapter 4). Whilst other measures of

EI could have been chosen (and may have yielded different EI results), use of the MSCEIT allowed for some degree of confidence that the concept labelled EI in this thesis reflects the cognitive-emotional abilities underpinning social interactions, and therefore provides greater clarity when interpreting the findings of this thesis from an educational standpoint. Additionally, MSCEIT scores show minimal overlap with personality traits (Brackett and Mayer, 2003), and sufficient discriminant validity has been found between the MSCEIT and general intelligence (Lopes et al., 2003). Coupled with the high reliability and validity estimates reported (Brannick et al., 2011, Mayer et al., 2002, Mayer et al., 2003), the use of the MSCEIT is a strength of the current study and was considered to be the most appropriate measure, congruent with the conceptual approach of the research, for investigation of the concepts of interest.

However, the MSCEIT was developed in the USA and, whilst it has been extensively applied to UK participant populations, its applicability to a *UK* medical sample has not yet been validated. The medical students and doctors who participated in the current research were atypical of the general population due to a narrow range of ages being represented and the sample being a highly selected population chosen for their academic excellence and desire to pursue a career in medicine. The reliability and construct validity of the MSCEIT in a medical sample in the USA has been found to be adequate (Brannick et al., 2011); however, the lack of prior validation on a UK medical sample may be a limitation of the current thesis. Similarly, the majority of studies validating and applying the MSCEIT to a medical population have been conducted in Western countries. Similar generalisability of the MSCEIT to both individualist Eastern and collectivist Western cultures has been reported (Karim and Weisz, 2010). However, questions have been raised regarding the cross-cultural generalisability of the MSCEIT (Karim and Weisz, 2010), a pertinent point given that the research in this thesis was conducted in the UK with primarily Western participants.

Questions have also been raised as to the subjectivity of MSCEIT scoring. First, the most appropriate responses are decided by a panel of 'experts', therefore introducing potential issues of bias. Also, the notion that recognition of one's emotions requires a certain degree of introspection has posed some researchers to

question whether some parts of the MSCEIT are indeed ability-based, or whether they require participants to self-report traits or characteristics (Humphrey et al., 2007) (thus raising the issue of socially desirable responding bias). Whilst the MSCEIT clearly is less of a self-report measure than dispositional or trait measures of EI, this point should be considered when interpreting the thesis' findings.

Furthermore, although it is no longer than other measures of EI, participants are required to spend 30-45 minutes completing the MSCEIT, which may be enough to discourage participation (Pearson, 2011). A shorter measure of EI may have resulted in increased sample sizes and therefore may have altered the findings; this should be considered when interpreting the findings of this thesis.

2.3   **Use of Simulated Patient Encounters**

Simulated patient encounters were chosen for Studies 1 and 2. The use of simulated patients and standardised scenarios allowed for confidence in the fact that the significant results observed in the two studies were due to differences in participant-level rather than patient-level characteristics. Whilst it was not possible to control for the influence of simulated patients' age or gender on the clinical encounter entirely, literature lends support for the use of simulated patients within an OSCE setting, particularly in terms of their validity and reliability (Cohen et al., 2003, Kurtz et al., 2005, Lane and Rollnick, 2007, Sanson-Fisher and Poole, 1980). The influence of simulated patients' characteristics on each interaction was thought to be minimal and unlikely to influence each interaction in a significant or meaningful way. Additionally, the extensive simulated patient training (particularly with respect to standardisation of cue expression) and the standardisation of the OCSE in both studies, allowed for students to be presented with the same opportunities to identify and respond to simulated patients' cues of emotional distress, thus increasing the validity of the findings. Finally, the use of simulated patients and standardised scenarios in both Study 1 and Study 2 allowed for collection of comparable data and subsequently more sophisticated analyses, than if a differing approach had been taken in either study.

However, whilst there are a number of strengths associated with assessing PPC in a standardised examination context, the external validity and generalisability of the findings to non-assessed contexts or real clinical settings may be limited.

Attempts were made to address this limitation through the use of multiple studies; Study 2 applied the model developed in Study 1 to a population consulting in a more 'demanding' OSCE, whereas Study 3 translated the findings of both Studies 1 and 2 into the non-assessed clinical setting. However, in Study 3 it was not possible to study as large a cohort as in Studies 1 and 2, thus potentially reducing the power and generalisability of the findings. Whilst primarily considered a strength of the current thesis, it is therefore important to bear in mind the limitations associated with the use of simulated patient encounters.

2.4   **The Study of Patient-Provider Communication in General Practice**

PPC was studied in General Practice in Study 3, thus translating the research conducted in Studies 1 and 2 to the clinical environment. Transference of skills from the simulated, undergraduate environment to the non-assessed, clinical postgraduate environment requires doctors to generalise learned PPC behaviours to the professional context and integrate them into their normal practice (Baldwin and Ford, 1988, Heaven et al., 2006, Tamblyn et al., 1994). Investigation of the findings of Studies 1 and 2 in a 'real' setting brings further clarity regarding their influence on doctors' PPC and patients' views of this PPC. Additionally, studying PPC in General Practice allowed for doctors to be studied interacting with a number of patients, rather than three or four simulated patients with limited scripts, thus increasing the generalisability of the findings. Also, because junior doctors had not yet specialised in a particular medical specialty, the risk of bias was reduced; i.e. if General Practitioners had formed the participant group then this may have been a self-selecting sample as those high in EI or low on attachment avoidance/anxiety may have naturally chosen to enter Primary Care due to its high level of patient contact (Ciechanowski et al., 2004, Ciechanowski et al., 2006). These should all be considered strengths of Study 3.

However, in General Practice it was not possible to standardise patients between doctors. Whilst patient-level characteristics were collected and considered in subsequent analyses, it was therefore not possible to conclude with as much certainty as in Studies 1 and 2 that the findings of analyses were primarily attributable to differences between doctors rather than variation at the patient level.

2.5   Choice of Participants

As outlined in the introduction to Part 2, careful decisions were made regarding the participant groups studied; the selection of early year medical students and junior doctors as participants was based on theoretical and research considerations. Selection of such groups was thought to maximise the potential of the research and practice recommendations arising from this thesis (see Chapter 8). However, as outlined in Part 1, there is a need for investigation of factors influencing individual differences in providers' PPC across a number of medical disciplines and stages of medical education. Obviously, this thesis could not address such a wide remit and therefore the provision of baseline data upon which to build subsequent research should be commended. However, it must be stressed that the generalisability of the findings of this thesis may be limited to the early-year medical students and junior doctors studied and may not apply to other populations or avenues of medicine.

2.6   Choice of Measures to Quantify Patient-Provider Communication

Throughout the thesis, standardised checklists (the LUCAS/modified LUCAS and the CAT-S) provided objective, reliable and valid assessments of PPC. These checklists were supplemented with coding of specific patient and provider behaviours (the VR-CoDES). This approach provided rich data regarding providers' PPC, including providers' ability to deal with patients' emotional distress. It must be stressed that the coding scheme and checklists chosen were one of a number of choices and thus different options may have resulted in different data. However, the choice of measures, and their triangulation, is a strength of the current thesis, for the reasons outlined in Sections 2.6.1, 2.6.2 and 2.6.3 below.

However, there are also a number of limitations associated with the application of coding schemes and checklists to quantify PPC. Each measure has individual strengths and limitations which will be discussed in turn below; an overview of the complexities of quantifying PPC will first be briefly discussed.

The concept of 'PPC skills' is inherently reductionist given that it assumes that complex behaviours can be atomised into discrete, observable and measurable skills (Salmon and Young, 2011). Using a descriptive coding scheme or checklist to

quantify PPC assumes elements of PPC can be easily and reliably recognised. It also negates consideration that providers often demonstrate intuition and flexibility in PPC rather than application of previously defined skills (Salmon and Young, 2011), a concept known as 'phronesis' (Dowrick et al., 2009). The meaning of PPC is subjectively shaped and is influenced both by individuals' subjective and social contexts, and the previous dialogue within the interaction (Egener and Cole-Kelly, 2004). The designation of some PPC behaviours as 'skills' fails to consider this subjectivity (Plum, 1981) and therefore coding schemes and checklists may not measure what patients value in a consultation. This is why patient satisfaction was also quantified; the lack of relationships observed between patient satisfaction scores and doctors' proportions of 'provide space' and 'affect focused' responses in Study 3 lend support for there being limited overlap between coding schemes/checklists and aspects of PPC that patients consider to be important. Moreover, outcomes will exist locally and transiently in dialogue (Hulsman, 2009), thus potentially resulting in difficulties relating the outcomes of such measures to patient-level outcomes.

It is also argued that perceptions of 'effective' PPC differ depending on whether the perspective of a patient, a practitioner or a researcher is taken (Epstein, 2006). Checklists and coding schemes were considered to form a reliable means of quantifying and exploring a limited range of medical students' and doctors' PPC skills and behaviours throughout this thesis. However, triangulation of these methods with qualitative data may have provided richer data from the patient and provider perspective. Whilst providing important preliminary data regarding the influence of providers' attachment styles and EI on their PPC, failure to triangulate data in this way should be considered a limitation.

2.6.1 The Liverpool University Communication Assessment Scale and Modified Liverpool University Communication Assessment Scale

The LUCAS used in Study 1 has proven reliability and validity, was explicitly informed by a theoretical conceptualisation of PPC, and rests on the premise that skilled communication is only loosely related to PPC skills (Huntley et al., 2012). In this respect, examiners using the LUCAS are trained to take into account the subjectivity and inherent creativity of effective PPC and assess the effectiveness of PPC in the interaction in which it is being assessed, rather than

rating it in isolation (Huntley et al., 2012). Use of the LUCAS therefore overcomes several of the inherent difficulties associated with assessing effective PPC in the undergraduate medical education arena (Huntley et al., 2012) and can therefore be viewed as a strength of Study 1.

However, as discussed in Chapter 4, the LUCAS was designed to identify problematic rather than excellent communicators and has a 'ceiling effect', as evidenced by students' high mean total scores. In Study 1, the notion that consideration of a tool with a greater range of response options may provide greater information for research purposes was discussed. This limitation was addressed in Study 2, which utilised the modified LUCAS to assess students' PPC, thus increasing the range of possible scores and also adding consideration of the student's skill in eliciting clinical information. In this respect, the modified LUCAS provided richer and more clinically representative data regarding students' PPC than available in Study 1.

EI mediated the influence of attachment avoidance on PPC in both studies, indicating that the 'ceiling effect' hypothesised to occur in Study 1 did not appear to bias or unduly negatively influence the findings. However, use of the more detailed modified LUCAS limited the comparisons that could be made between the findings of Study 1 and Study 2. This must be considered as a limitation, despite choice of measure being based on a) reliability and validity and b) current practice at the University of Liverpool. Additionally, the LUCAS and the modified LUCAS do not take into account simulated patients' perceptions of students' PPC, which may differ from examiners' ratings of PPC (Mazor et al., 2005). Consideration of a tool which reflected both perspectives may have provided a more valid assessment of students' PPC, potentially more generalisable to non-assessed contexts or clinical settings, than the checklists used in these studies.

2.6.2   The Verona Coding Definition of Emotional Sequences

Application of the VR-CoDES to quantify providers' responses to patients' cues of emotion is a strength of the thesis. Quantification of providers' verbal behaviour in this manner is deemed to be more reliable and less subjective than qualitative research (Mead and Bower, 2000) and is consistent with the majority of published research into PPC. Given that it was only recently developed, the size of

the research literature on the VR-CoDES is relatively small when compared to research applying other coding schemes, thus limiting the potential for comparison of the findings of this thesis with those of other published research. However, the advantage of the VR-CoDES is that it was developed by experts in the field, all of whom had a certain degree of familiarity of previous coding schemes, to address issues of heterogeneity in coding schemes' definitions of cues, concerns and responses. The VR-CoDES, therefore, is likely to gain widespread use throughout medical communication research and therefore its use puts the current research at the forefront of methodological thinking and practice. Data from this thesis should therefore prove a useful point of reference for researchers, clinicians and educators, as use of the VR-CoDES becomes more widespread. Additionally, the stringent inter-rater reliability (.93) for the VR-CoDES obtained in this thesis indicates high levels of measurement accuracy. It allows for the findings to be confidently related to previously published VR-CoDES data, and again is a strength of the research.

However, the VR-CoDES also has a number of limitations. Notwithstanding the time taken for researchers to be trained in the technique of applying the codes, and the time expended in subsequently applying the coding scheme to data (which takes approximately twice as long as the consultation length), the VR-CoDES was developed to quantify PPC between qualified practitioners and their patients. Application of the VR-CoDES to medical students consulting in an assessed environment created problems when coding data. For example, in Studies 1 and 2, students were aware prior to entering the OSCE that they should explore both emotional and biomedical cues, and therefore they often investigated physiological correlates of the presenting complaint. Take this example:

Simulated patient: "*It's this tiredness that's really getting me down though, and it's ridiculous cos it's not like I can go and have a nap at work or anything!*"

Student 132, Study 1: "*Have you had any other symptoms, like shortness of breath or anything?*"

These responses were coded as 'ignore' in line with the coding guidelines (Del Piccolo et al., 2009), despite fulfilling the requirements of the OSCE situation. This may have resulted in an overestimation of the proportion of 'reduce space'

responses in the medical student sample. Furthermore, the use of the 'switch' code may also have contributed to this potential overestimation. This code 'reduces space' for further emotional discussion and is used when the provider's response to a cue either refers the patient to a third party, changes the frame of reference of the cue, or enquires about how a third party's perception of the cue. However, students in both Study 1 and Study 2 were aware that they would be penalised for giving the simulated patient inappropriate reassurance or information beyond their level of training, therefore a 'switch' response may have been entirely appropriate. Student VR-CoDES data may therefore not be comparable with doctor VR-CoDES data, as inherently it may reflect a greater proportion of 'reduce space' behaviours. Future studies could reanalyse the data from Studies 1 and 2 in light of these points to allow the data to be more accurately compared to those from doctor samples.

2.6.3 The Communication Assessment Tool- Short Form

Use of a standardised tool to quantify patient satisfaction with providers' PPC allowed for data suitable for investigation of the predictive influences of patient-level and doctor-level characteristics on patients' perceptions of the PPC in their consultations. The CAT-S was designed to assess one finite PPC interaction and in this respect focuses on provider individuality rather than the influence of previous doctor-patient interactions (Makoul et al., 2007). In addition, the CAT-S demonstrates high levels of reliability and validity and assesses core competencies of PPC similar to those assessed using the LUCAS/modified LUCAS, thus allowing for a degree of comparison between data from the studies reported in this thesis (Makoul et al., 2007). The analysis approach taken (dichotymisation of doctors into 'excellent' or 'non-excellent' communicators) is in line with the authors' recommendations as it allows for a better indication of variability between doctors (Makoul et al., 2007). Use of the CAT-S to quantify patient satisfaction can therefore be considered a strength of the current study.

However, as with the attachment and VR-CoDES data, limited published data resulting from use of the CAT-S made comparison with other samples difficult. Additionally, dichotomising data may have reduced the precision of some analyses, as discussed in Chapter 6. These points should be considered as limitations in the use of the CAT-S.

2.7   **Limitations in Data Collection and Analysis**

A strength of this thesis is the volume and range of data collected. However, an obvious limitation is the asymmetry between data collected pertaining to medical students and those collected for doctors, given that substantially more data were collected for medical students. However, the doctor study was designed as a preliminary pilot study. Its data helped to allow for confidence in the transferability of the findings from the simulated to the real clinical milieu, pertinent given that PPC in clinical practice differs from PPC in a simulated and assessed setting (Hanna and Fins, 2006, Ram et al., 1999). Empirical published data from other doctor samples (Weng, 2008, Weng et al., 2008, Weng et al., 2011a, Weng et al., 2011b, Weng et al., 2011c, Wagner et al., 2002, Salmon et al., 2007, Salmon et al., 2008, Fenton, 2008) also help to redress the balance in the data collected between medical students and doctors, as they provide a context for interpretation of the findings of Study 3.

Second, in line with the requirements of the ethics committees, patients (simulated or actual) were purposely not in camera shot in order to protect their anonymity. Whilst this measure addressed the ethical complexities involved in this research, it reduced the possibilities for quantification and consideration of non-verbal behaviours between provider and patient, thus potentially influencing the results. For example, it was not possible to objectively rate with any confidence how patients interpreted the verbal and non-verbal behaviours of the providers; consideration of their non-verbal behaviour would have aided this process and influenced the resulting VR-CoDES data.

Third, throughout the thesis, no analyses were conducted on individual VR-CoDES codes or cue types, rather codes and cues/concerns were grouped together to allow for large enough samples for meaningful analyses. Collapsing data in such a way may have reduced the sensitivity of the analyses to individual differences in responding based on attachment styles or EI. Additionally, calculation of overall proportions of 'provide space' and 'affect focused' responses failed to take into account that differing cues may require differing degrees of provider facilitation. Whilst the methods of analysis in the current thesis were chosen in line with current consensus as to the most reliable, replicable, objective and mutually comparable

methods, it must be acknowledged that a conversation between two individuals is "*more than a sum of the monologues*" (Bensing et al., 2003) (p78). Sequence analysis, in which the probability of different antecedent and subsequent provider responses to a patient cue is calculated, may have provided richer data regarding the appropriateness of providers' responses (Roter and Hall, 2004).

Fourth, whilst the term 'effect' was used throughout the analyses, it is important to note that the SEMs conducted in Studies 1 and 2 were based on correlations and therefore no inferences can be made as to causal relationships between variables. The final SEM of attachment avoidance, EI and overall OSCE scores (Figure 8 on page 134) represents only one possible organisation of variables, despite being based on the empirical and theoretical literature outlined in Chapters 2 and 3. The fit indices indicated good model fit in both studies, but it is possible that the data could have fitted equally well to alternate orderings. Given that EI develops partly as a function of an individual's attachment avoidance (Kafetsios, 2004), it is unlikely that an alternate ordering of the models would be theoretically justified. However, the reader should bear this in mind as a possible limitation of the analyses.

Fifth, participants' ethnicities were not considered in the analyses. This was because data regarding participants' ethnicities were collected, with permission, from the medical school office. Students had self-reported their ethnicity upon admission, therefore resulting in a disparate and wide ranging number of categories. The only differentiation possible was to sub-divide participants into 'White British' and 'non-White British' ethnic categories, as reported in Study 1 and Study 2. However, this differentiation was not thought to add in any meaningful way to the analysis given that an individual's perception of their ethnicity and culture is multifaceted and contextualised (Giddens, 1991). The author was mindful of the risk of re-categorisation of a participant into an ethnic category that they may or may not self-identify with. The decision was therefore made not to conduct any analyses on these data beyond reporting the proportion of 'White British' and 'non-White British' participants. However, ethnicity has been suggested as a contributory factor affecting medical students' PPC (Fernandez et al., 2007, Liddell and Koritsas, 2004, Wass et al., 2003). Lack of consideration of ethnicity should therefore be considered a limitation of the research, albeit a limitation based on mindful practice.

Supplementing this research with qualitative work would allow for further exploration of the important contextual aspect of ethnicity, culture and identity on the relationships between attachment, EI and PPC.

Finally, the issue of Type I error must be raised as a limitation. MSCEIT Branch, Area and Total scores were analysed in order to provide a comprehensive overview of the influence of EI on PPC. However, the large number of comparisons, whilst theoretically adequately powered, increased the chances of Type I errors. Throughout all studies, data were analysed as a whole rather than in subgroups of gender etc. to minimise this risk, and no analyses of individual-item data were conducted. Furthermore, the SEM in Study 2 was run on data from all participants, rather than considering the fit of data from longitudinal participants and those from non-longitudinal participants using separate models. However, when combined with the adoption of 5%, 1% and 0.1% significance levels, the risk of Type I errors must be considered when interpreting the findings. This is particularly important in Study 3 given its small sample size.

2.8 Variables Chosen for Investigation

Criticism has been levelled at research applying psychological and sociological theories to the study of PPC given that no theory can adequately account for the diverse situations and conditions under which PPC occurs (Flyvbjerg, 2001); by inference, multiple psychological theories are needed to describe and prescribe PPC behaviour. One strength of the current research is therefore the application of two complementary theories to the study of PPC.

However, it must be noted that the vast majority of variance in OSCE scores and other outcomes was *not* explained by students' and doctors' attachment styles and EI, therefore indicating that other variables not measured in this thesis are likely to have had predictive value. The literature identifies the influence of factors such as personality traits (Corrias et al., 2010, Lievens et al., 2002), cognitive ability or learning style (Ferguson et al., 2002), prior teaching (Marteau et al., 1991) and transient health states such as depression, anxiety and perceived stress levels (Stewart et al., 1999b) on PPC and examination performance (although currently unpublished data, forthcoming, suggests no influence of stress, depression or anxiety on fourth-year medical students' PPC in an OSCE (Fletcher, 2013)). Whilst some

factors were standardised across participants, such as level of teaching, others were not and may account for some of the unexplained variance in OSCE scores or patient-level outcomes. For example, subjective early experiences when on placement may influence students' or doctors' subsequent PPC; the quality of students' first interaction with a 'real' patient whilst on placement has been identified as influential in shaping students' PPC development (Royston, 1997). The research was not designed to measure the influence of these variables. However. their omission may have subsequent implications should one decide to implement an educational intervention based on the findings of this thesis, and should therefore be viewed as a limitation.

3   **Summary of Chapter**

This chapter discussed the strengths and limitations of the methods adopted and measures used throughout this thesis in order to provide context for interpretation of the practice and research recommendations arising from this thesis. Chapter 8 will now be presented, which summarises these recommendations as a prelude to the overall conclusions of the thesis.

Chapter 8: Practice and Research Recommendations Arising from this Thesis

1 Introduction

Chapter 7 contextualised the findings of this thesis by discussing the methodological strengths, considerations and possible limitations common to its three empirical studies. This final chapter first summarises the key findings of the thesis. Recommendations for further research are then discussed and practice points proposed. Finally, the chapter ends the thesis by offering an overall conclusion to the main research question investigated.

2 Summary of the Main Findings

The thesis' aim was to explore the relationships between medical students' and doctors' attachment styles, EI and PPC, with specific emphasis on identifying and responding to patients' cues of emotional distress, in order to propose evidence-based practice and research recommendations. With regards to this aim, five main findings can be taken from the three empirical studies (Chapters 4, 5 and 6), their methodological limitations notwithstanding (Chapter 7). These findings will be briefly outlined below.

First, irrespective of their psychological 'makeup', medical students and doctors generally displayed behaviours that indicated competence in identifying, and comfort in discussing, emotional matters with patients, be they real or simulated. Data from Studies 1 and 2 indicated that medical students were generally able to identify simulated patients' cues to emotional distress, and provide these patients with opportunities to further discuss this distress. This was reflected in medical students' high overall OSCE scores (average of 91.78% in Study 1 and 67.10% in Study 2, with the difference in scores probably attributable to the increased difficulty of the Study 2 OSCE in comparison to that of Study 1, reflective of a further year of undergraduate medical education and patient experience).

Naturally, caution must be taken in generalising findings from assessed examination settings to the clinical milieu. However, data from Study 3 indicated that doctors also tended to 'provide space' for further discussion of patients' emotions, and in particular were comfortable discussing both the affective elements

of cues and their factual content. Indeed, proportions of 'provide space' responses was relatively consistent across the three studies, with congruence also noted between proportions of 'affect focused' responses (14.21% in Study 1, 16.01% in Study 2 and 15.05% in Study 3). Furthermore, the patients of the junior doctors were also satisfied with their PPC, with no doctor being rated as a 'poor' or 'very poor' communicator. This is an important finding, given that some components of PPC are more subtle and complex than can be captured using standardised checklists, such as the LUCAS/modified LUCAS, or even with descriptive coding schemes such as the VR-CoDES (Epstein, 2006, Mazor et al., 2005). These components may include tone of voice and patients' perceptions of the doctors' level of engagement with the consultation (Ambady et al., 2002). That patients rate doctors' PPC positively is encouraging given the empirical links reported between patients' views of PPC and positive health outcomes (Street et al., 2009, Stewart, 1995), discussed further in Section 3.3 of Chapter 2.

The second main finding is that medical students' and doctors' attachment styles negatively influenced their PPC. Data from Studies 1 and 2 indicated that, in isolation, medical students' attachment avoidance negatively influenced their ability to communicate with simulated patients in an OSCE situation, in a manner congruent with current undergraduate assessment criteria at the University of Liverpool. This influence was observed across both studies but became stronger in Study 2 when students were required to communicate in a more 'demanding' OSCE setting. This indicates that students who score highly on attachment avoidance perform less well in their OSCEs than those who score lower. Similarly, data from Study 3 indicated that, in isolation, doctors' attachment anxiety was negatively related to the number of cues presented by patients, and positively influenced doctors' proportion of 'affect focused' responses. This suggests that not only do providers' attachment styles influence their examination performance, but they also influence doctors' and patients' behaviours when interacting in the clinical environment. The consistency of the influence of attachment styles across the three studies further allows for confidence in concluding that medical students' and doctors' attachment styles influence their PPC.

It is interesting to note that whilst attachment influenced both medical students' and junior doctors' PPC, the dimensions had different effects on the two samples' PPC. In the medical student sample, congruent with other literature (Hick, 2009), attachment avoidance was the stronger (and indeed only significant) predictor of OSCE scores. However, in the junior doctor sample, congruent with other literature (Salmon et al., 2008), attachment anxiety was the stronger predictor of cue presentation and proportions of 'affect focused' responses; relationships were observed between attachment avoidance and cue presentation in patients presenting with a psychosocial health complaint only. These findings indicate the importance of providers being aware of the influence of their attachment styles on their behaviour within the doctor-patient relationship (Wilkinson, 2003), but suggest that the influence of attachment anxiety and attachment avoidance may differ depending on the context of the PPC.

Third, medical students' and doctors' attachment styles were positively related to their EI. These relationships were similar in strength and direction across the three studies, again allowing for confidence in this finding and supporting the rationale for hypothesising a relationship between the constructs throughout the thesis (Kafetsios, 2004). This suggests that individuals with low attachment avoidance and attachment anxiety are likely to have high EI.

Fourth, medical students' and doctors' EI positively influenced their PPC. As with attachment, this influence was observed on OSCE scores in Studies 1 and 2, becoming stronger in Study 2 when a more 'demanding' OSCE was considered. Junior doctors' EI also positively influenced the number of cues presented by patients presenting with psychosocial heath complaints, although it had a negative influence on the number of cues presented by patients with physical health complaints. This indicates that patients presenting with psychosocial health complaints are more likely to present cues to junior doctors with high EI than those with low EI. However, the influence of junior doctors' EI on cue presentation was stronger in patients presenting with psychosocial health problems than in those presenting with physical health problems. These data support the theoretical rationale for applying the theory of EI to the study of individual differences in PPC (see Chapter 2).

Finally, providers' EI may mediate the influence of their attachment styles on their PPC. This means that, although high EI is associated with low attachment avoidance and low attachment anxiety, if a provider has high EI and high attachment avoidance then the positive influence of their EI on their PPC may 'override' the negative influence of their attachment avoidance on PPC. This finding was confirmed in the two studies conducted in an undergraduate medical education population (Studies 1 and 2), irrespective of the difficulty of, and nature of emotive content displayed in, the OSCE. This trend was also noted in junior doctors with respect to cue presentation, although firm conclusions were unable to be drawn regarding the mediating influence of EI without further research.

This finding can potentially be considered the most important one to arise from the thesis' empirical work. This is because attachment styles are seen as relatively stable across an individual's lifetime (Maunder and Hunter, 2008), whereas, as outlined in Chapter 2, there is thought to be considerable potential for development of EI-based competencies across undergraduate and postgraduate medical education (Cherry et al., 2012, Sattersfield and Hughes, 2007). However, it is important not to minimise the other four main findings of this thesis; all five main findings have several implications, both for research and for practice, as highlighted in the introductory section to Part 3. The research recommendations and practice points related to these findings will now be discussed.

3   Research Recommendations

Several recommendations for future research can be proposed based on the overall findings outlined above and the three studies' associated methodological considerations.

First, as outlined in Chapter 7, the exploratory and unique nature of the research means that the congruence of its findings with those of other published samples is, as yet, unclear. The research was carried out within one geographical location, primarily with student and postgraduate cohorts of one large UK medical school. It is therefore most likely that there will be variations, albeit limited, in the findings between medical schools. Furthermore, the cross-cultural validity of the findings is, as yet, unknown. The first research recommendation is therefore to conduct further work to investigate whether the findings of this thesis apply to other

provider groups, care settings and geographical locations. This is particularly important for Study 3, given that its generalisability is particularly undermined by its small sample size. Priority should therefore be paid to ensuring the generalisability of the findings of Study 3, before turning research attention to the generalisability of Studies 1 and 2. Such research should be conducted in larger, more representative samples, to confirm or disconfirm the congruence of Study 3's findings with those of other published research (Salmon et al., 2007, Salmon et al., 2008, Fenton, 2008). Consideration of this initial research recommendation would allow for further confidence in the stability and validity of the findings of this thesis and would further support the proposed practice points (see Section 4 of this chapter).

Second, it is important to note that whilst no relationships were found between attachment styles and proportions of 'provide space' or 'affect focused' responses in the medical student samples studied, attachment anxiety significantly predicted junior doctors' proportion of 'affect focused' responses. This indicates potential differences in the influence of attachment avoidance and attachment anxiety on PPC between provider groups. Similarly, whilst EI mediated the influence of attachment avoidance on medical students' OSCE scores and influenced patients' cue presentation, no relationships were observed between providers' EI and their responses to simulated patients' or patients' cues in any of the three studies. These data may be partially attributable to the simulated, assessed setting in which medical students were studied, participants' different levels of training or experience, or the limitations associated with applying the VR-CoDES to a medical student sample (see Chapter 7). The findings therefore require further research and validation. Attachment style is viewed as relatively stable across the lifetime (Maunder and Hunter, 2008), whereas ability-based EI is seen as malleable and developmental across an individual's undergraduate medical education (Cherry et al., 2012, Sattersfield and Hughes, 2007). The second research recommendation is therefore to consider the influence of undergraduate and postgraduate medical education on the relationships between attachment styles, EI and PPC, specifically responding to patients' cues of emotional distress.

Third, and related to the second point, more research is needed to assess the mechanism by which EI influences PPC of emotive issues, given that no

relationships were observed between medical students' or doctors' EI and their responses to patients' cues, be they simulated or real. For example, medical students' and doctors' responses to cues may differ as a function of cue type. Future research should therefore utilise all of the VR-CoDES response categories, rather than collapsing responses into proportion of 'provide space' and 'affect focused' responses. Additionally, consideration of each separate cue type, rather than analysing all emotive utterances under the umbrella term 'cues', is recommended (see Appendix 6), as is sequence analysis of coded data. Furthermore, qualitative data may add richness to the quantitative data collected within this thesis, and provide additional clarity regarding the role of EI, as well as its associated components, in influencing PPC. Researchers should therefore consider triangulating the findings of this thesis using qualitative data. The third research recommendation, therefore, is to further investigate the mechanism by which EI influences PPC of emotive issues

Finally, it is necessary to consider the applicability of the measures used in this thesis to a medical population. The MSCEIT and ECR:SF were both developed outside of medicine and neither have been validated for use in a UK medical population. The fourth, and final, research recommendation is therefore to conduct research validating the ECR:SF and MSCEIT in a UK medical population. Such research would allow for confidence in the validity of the concepts being measured and the subsequent findings of the three studies reported in this thesis. Similarly, research investigating the feasibility of a version of the VR-CoDES for use in student samples would be welcomed, particularly given the issues raised when coding student-simulated patient interactions (see Section 2.6.2 of Chapter 7).

4   Practice Points

This section discusses the practice points that can be proposed from the findings of the empirical research reported within this thesis. These points should be interpreted with the appropriate level of caution, the methodological considerations and limitations of the empirical research notwithstanding (Chapter 7). They should be considered as conclusive only once the research recommendations, discussed above, have been implemented and their findings found to be congruent with the

findings of these three studies. Until this time, they should be interpreted in light of these cautionary points.

As outlined in Section 2 of this chapter, medical students and junior doctors were generally able to identify simulated patients' cues to emotional distress, and provide these patients with opportunities to further discuss this distress most of the time. If these data can be generalised, they indicate that undergraduate medical education in the UK is currently selecting medical students, and producing doctors, who are generally able to communicate in a manner congruent with examiners' expectations. Furthermore, these individuals are relatively comfortable discussing patients' emotions, and who are generally rated as 'very good' or 'excellent' communicators by their patients, irrespective of their psychological 'makeup'. These findings alone are encouraging, given the associations reported between effective PPC and positive patient outcomes (Kaplan et al., 1989, Rost et al., 1989, Roter and Hall, 1993, Hickson et al., 1994, Stewart, 1995, Levinson and Chaumeton, 1999, Stewart et al., 1999a, Street, 2001). They support the importance of teaching and assessing PPC skills during undergraduate and postgraduate medical education (General Medical Council, 2009b) (General Medical Council, 2009a). The *first* practice point to emerge from this thesis, therefore, is that, subject to replication of these findings in other samples, PPC skills should continue to be formally taught during undergraduate and postgraduate medical education. This teaching should be structured in such a way as to encourage students to develop the skills involved in identification and responding to patients' cue. It should also raise awareness of the importance of balancing the biomedical and psychosocial aspects of PPC and of the influence of emotions on PPC and learning (Silverman et al., 2005). Such teaching should continue to be introduced to students early in the curricula to equip them with explicit PPC knowledge and allow them both to *develop* positive and effective PPC skills and *practice and reinforce* such skills during clinical placements (Humphris, 2002). This approach would equip students with explicit, domain-specific PPC knowledge, but would also encourage the translation of this knowledge to the clinical milieu.

It is important to note that no relationships were found between medical students' overall OSCE scores and their proportions of 'provide space' and 'affect

focused' responses. These findings are congruent with other research conducted at the University of Liverpool into PPC in fourth-year medical students (Hick, 2009). These data suggest that current methods of assessing PPC at the University of Liverpool (i.e. OSCEs) do not differentiate between students based on their abilities to identify or discuss patients' emotions, as quantified using the VR-CoDES. This is despite the LUCAS and modified LUCAS including items to assess students' degree of empathy and responsiveness to patients' concerns. There is a clear need for undergraduate medical education to formally assess such skills prior to graduation, given that lack of identification of, or inadequate responding to, patients' emotional distress can lead to a number of iatrogenic patient outcomes (Ong et al., 1995, Levinson et al., 2000, Bensing et al., 2010). The *second* practice point to arise from this thesis, therefore, is that PPC assessment at the University of Liverpool should consider incorporating a means of assessing students' abilities to identify and respond appropriately to simulated patients' cues of emotion. However, it is not recommended that the VR-CoDES should be integrated into OSCE assessments, given that it is a time-consuming method designed for research rather than assessment use.

Medical students' and doctors' attachment styles negatively influenced their PPC. Differences in the influence of attachment dimensions notwithstanding, these data have important educational implications, as they show that attachment influences PPC in both the simulated and the clinical milieu. Educating students about the potential influence of their attachment styles on their PPC may therefore form a valuable contribution to undergraduate and postgraduate medical education (Wilkinson, 2003). It could help students to understand how their conscious feelings about close relationships may influence their PPC and develop students' awareness of their own attachment styles and how to use them, or compensate for them, effectively. It may also allow students to recognise situations in which their attachment IWM may be activated. Education may also assist practising doctors to identify situations in which their attachment styles may influence their PPC. However, it must be stressed that the results from the three studies within this thesis do *not* indicate that education within curricula should focus on changing medical students' or doctors' attachment style, or that applicants should be selected for entry to medical school based on their attachment styles.

The findings of this thesis also suggest that providers' EI may mediate the negative influence of their attachment styles on their PPC. This is a pertinent finding because considerable research attention has been paid to the development of EI during medical students' years in medical school, and whether competencies underpinning EI can be actively developed (Cherry et al., 2012, Sattersfield and Hughes, 2007). Far from being a stable trait, it has been suggested that EI can actually be enhanced by learning skills such as being able to perceive, appraise, and express emotion, access and generate emotions when appropriate, and regulate and understand emotions (Cherry et al., 2012, Elam, 2000). These skills can be directed towards oneself ('self-directed'), such as talking positively, being aware of one's own emotions, controlling one's impulses, and regulating one's emotions. They can also be directed towards others ('other-directed'), such as making empathic statements, eliciting patient concerns and emotions, communicating emotions accurately and ensuring shared emotional processing (Sattersfield and Hughes, 2007). The skills that are most easily taught and measured, and most directly related to patient and provider outcomes, are those relating to emotional awareness, management and understanding (Elam, 2000). These include doctors being simultaneously aware of, and managing, both their patients' emotions and their own so that both parties experience the interaction in as positive a way as possible. Research is starting to show that the abilities associated with EI can be learned by medical students and that curriculum interventions can enhance this learning (Lewis et al., 2005). The *third*, and final, practice point to be proposed from this thesis, therefore, is that undergraduate medical curricula should consider EI as an attribute that can be nurtured throughout an individual's undergraduate medical education. Curricula should consider integrating teaching designed to improve or develop some of the skills outlined above into existing PPC skills' teaching at undergraduate level. This teaching should also emphasise the potential negative influence of medical students' attachment styles on their PPC, and the relationships between attachment and EI.

Integration of additional teaching into medical curricula can be difficult and require careful consideration. Several points can be recommended when considering integrating EI-based teaching into existing curricula (Zeidner et al., 2002). First, curriculum designers need to be assured that EI is a clearly-defined construct,

independent of personality or transient emotional states, which develops with age and experience and which can be accurately and reliably measured and applied within curricula in a useful way. Therefore, to maximise conceptual clarity, teaching should be based on a solid, ability-based conceptual framework, such as Mayer and Salovey's (1990) four-branch ability model, as adopted throughout this thesis. Conceptualising EI as an ability similar to general intelligence (Mayer et al., 2008) rather than as a series of traits and/or learned behaviours (cf Section 4.4 of Chapter 2) has a number of advantages. It is implicit in definition of the-branch ability-based model that its components can be taught and developed, which makes it suitable for inclusion in undergraduate medical curricula. Furthermore, measures of ability-based EI, such as the MSCEIT, consider both crystallised and fluid EI; that is, they measure EI abilities attributable to experience and learning, but also abilities related to novel problem-solving, independent of prior learning. Grounding EI-based teaching in the four-branch ability model of EI (Mayer et al., 2008) and measuring EI using the MSCEIT, should give it the best chance of improving both crystallised and fluid EI.

Second, educationalists should identify the educational, sociocultural and developmental contexts for implementation. This may be particularly difficult in medicine given differences in students' learning styles, clinical placements, opportunities for workplace learning and exposure to emotional experiences (Pearson, 2011). In order to manage the emotional and cognitive challenges of undergraduate medical education, deal with the uncertainties of medical diagnosis and treatment, recognise patients' emotional and psychosocial issues and deal with the stressors of workplace learning and clinical placements, medical students must be aware of the role of emotions in aiding their coping and survival throughout their years as a student and practitioner (Dornan, 2004, Pitkala and Mantyranta, 2004). In order to effectively integrate EI-based teaching, curriculum developers must be aware of the potential influence of these transitions on students' emotional experiences and associated learning, and put provisions in place to ensure that they have a range of skills upon which to draw when faced with emotionally challenging situations. EI-based teaching should therefore include tailored education regarding the influence of medical students' emotional reactions on their behaviours, cognitions and subsequent learning experiences.

Third, EI-based teaching should be integrated in PPC skills' teaching across all years of undergraduate medical education. This would allow for students to be aware of the influence of their attachment styles prior to interacting clinically with patients or simulated patients, and also provide students with the maximum opportunity to develop EI-related skills prior to graduation. It should be made mandatory for undergraduate students during the early years of medical education, where associations have been found between EI and PPC.

Fourth, students should be given regular and structured feedback regarding their EI and how it may influence their PPC. The value of using a number of means of quantifying PPC, including the use of objective score sheets and a detailed coding scheme, was discussed in Chapter 7. However, it is not recommended that the VR-CoDES should be used for feedback or incorporated into assessments of the effectiveness of EI-based teaching into PPC curricula, for the reasons stated above.

5   Conclusions

The previous sections of this chapter discussed the main findings and associated research and practice recommendations arising from the thesis; this section will offer an overall conclusion based on these data.

The aim of this thesis was to explore the relationships between medical students' and doctors' attachment styles, EI and PPC, with specific emphasis on identifying and responding to patients' cues of emotional distress, and to propose recommendations for practice and research based on these findings. This was addressed through three related studies, each conducted in a separate participant population. First, the relationships between first-year medical students' attachment styles, EI and PPC in an OSCE were investigated (Study 1). Relationships were found between medical students' PPC and both their attachment avoidance and their EI. SEM was used to model these relationships; EI mediated the negative influence of attachment on PPC. These data were then furthered in an investigation of the influence of second-year medical students' attachment styles, EI and PPC in a more 'demanding' OSCE (Study 2). Irrespective of the change in OSCE, the same relationships were observed, including the mediating influence of EI on the relationship between attachment avoidance and PPC. Finally, the influence of junior doctors' attachment styles and EI on their PPC was studied, by researching junior

doctors consulting with real patients in General Practice (Study 3). Whilst removing the degree of standardisation possible in Studies 1 and 2, Study 3 translated the research into the clinical milieu and therefore increased the generalisability of the findings. Junior doctors' attachment significantly influenced both patients' cue expressions and doctors' proportion of 'affect focused' responses, again indicating the influence of attachment on PPC. Junior doctors' EI did not influence their responses to cues but influenced patients' cue expressions. Its influence was stronger in patients presenting with psychosocial health complaints than in those with physical health complaints, indicating complexity in its influence on PPC.

The studies within this thesis provide a unique contribution to the research literature regarding the influence of medical students' and doctors' attachment styles and EI on their PPC, including their ability to identify and respond to patients showing emotional distress. When the findings of all three studies are considered together, several main findings emerge. First, the medical students and doctors studied were generally able to communicate in a manner congruent with examiners' expectations. Furthermore, they were relatively comfortable discussing patients' emotions, and were generally rated as 'very good' or 'excellent' communicators by their patients, irrespective of their psychological 'makeup'. This indicates, generalisability of the sample notwithstanding, that current teaching, assessment and selection procedures are selecting and producing medical students and doctors who are comfortable communicating with patients, specifically when discussing patients' emotions. This is particularly encouraging when considering the positive patient benefits associated with effective PPC (Kaplan et al., 1989, Rost et al., 1989, Roter and Hall, 1993, Hickson et al., 1994, Stewart, 1995, Levinson and Chaumeton, 1999, Stewart et al., 1999a, Street, 2001).

Furthermore, medical students' and doctors' attachment styles and EI influenced their PPC. Attachment avoidance negatively influenced medical students' PPC as reflected in their OSCE scores, but this relationship was mediated by EI in both a first-year and second-year medical student sample. In clinical practice, both doctors' attachment anxiety and their EI influenced their PPC, again suggesting the possible mediating effect of EI on the relationship between attachment and patient-level outcomes. However, only attachment anxiety influenced doctors' *responses* to

patients' cues, indicating that further research is needed to assess how, or indeed whether, EI influences doctors' responses to cues. Patients' satisfaction with their PPC was not influenced by doctors' attachment or EI, nor by doctors' responses to their cues, indicating the complex mechanism by which observable doctor-level outcomes impact on patient outcomes.

These findings add to the growing body of literature suggesting the importance of considering attachment theory and EI with respect to PPC. However, several research recommendations must be proposed prior to conclusive acceptance of the findings of this thesis. First, researchers should replicate the three studies with different and larger samples to assess the generalisability of the findings. Second, longitudinal research should be conducted to assess the influence of undergraduate and postgraduate medical education on the relationships between attachment styles, EI and PPC, specifically responding to patients' cues of emotional distress. Third, more research is needed to assess the *mechanism* by which EI influences PPC of emotive issues. Finally, research should be conducted to consider the applicability of the measures used in this thesis to the populations studied.

Provided that the findings of this thesis are generalisable to other populations and settings, three practice points can be proposed. First, PPC skills should continue to be formally taught and assessed during undergraduate and postgraduate medical education, and should encourage development of the skills involved in identification and responding to patients' cues. Second, educationalists should consider integrating assessments of students' abilities to identify and respond appropriately to simulated patients' cues of emotion into current PPC assessment practices. Third, given the mediating influence of EI on the relationship between undergraduate medical students' attachment styles and their PPC performance, and potential mediating effect on patients' cue presentation in General Practice, undergraduate medical curricula should consider EI as an attribute that can be nurtured throughout an individual's undergraduate medical education. They should implement tailored educational interventions designed to assess and improve students' EI, whilst also emphasising the potential influence of students' attachment styles on their PPC.

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Appendices

Appendix 1: Systematic Review Search and Selection Information

1 Systematic Review (Chapter 3)

1.1 Search Strategy for Medline

Number	Term
1	Professional-Patient Relationship/ OR Physician-Patient Relationship/ OR Provider-Patient Relationship/ OR patient-centred$.mp OR patient-centered$.mp
2	Communicat$.mp OR behav$.mp
3	Interview, Psychological/
4	(consultation OR interview OR appointment OR visit OR encounter OR interaction OR cue$ OR concern$).mp
5	1 OR 2 OR 3 OR 4
6	student.ab,ot,ti OR doctor.ab,ot,ti OR physician.ab,ot,ti OR provider.ab,ot,ti OR practitioner.ab,ot,ti OR clinician.ab,ot,ti
7	5 AND 6
8	attachment.mp OR attach$.mp
9	attachment style/ OR emotional security/ OR mother-child relations/ OR attachment disorders/ OR attachment behavior/ OR attachment theory/ OR interpersonal interaction/ OR parent child relations/
10	8 OR 9
11	7 AND 10
12	(Emotional Intelligence).mp or (Social intelligence).mp OR caring.mp OR compassion.mp OR (Emotion$ competence).mp OR (Emotion$ development).mp OR (Emotion$ management).mp OR (Emotion$ self-awareness).mp OR (Emotion$ skills).mp OR (Emotion$ regulation).mp OR Empath$.mp
13	Empathy/
14	12 OR 13
15	7 AND 14
16	11 OR 15
17	Limit 16 to (english language and humans)

1.2 Search Strategy for Embase, PsycINFO and CINAHL

Number	Term
1	Communicat$.mp OR behav$.mp
2	(consultation OR interview OR appointment OR visit OR encounter OR interaction OR cue$ OR concern$).mp
3	1 OR 2
4	student.ab,ot,ti OR doctor.ab,ot,ti OR physician.ab,ot,ti OR provider.ab,ot,ti OR practitioner.ab,ot,ti OR clinician.ab,ot,ti
5	3 AND 4
6	attachment.mp OR attach$.mp
7	5 AND 6
8	(Emotional Intelligence).mp or (Social intelligence).mp OR caring.mp OR compassion.mp OR (Emotion$ competence).mp OR (Emotion$ development).mp OR (Emotion$ management).mp OR (Emotion$ self-awareness).mp OR (Emotion$ skills).mp OR (Emotion$ regulation).mp OR Empath$.mp
9	5 and 8
10	7 and 9

1.3 Figure to Illustrate Selection of Studies

```
┌─────────────────────────┐
│  Records identified     │
│ through database/hand   │
│       searching         │
│      (n = 2101)         │
└─────────────────────────┘
             │
┌─────────────────────────┐
│  Records after duplicates│
│        removed          │
│      (n = 1841)         │
└─────────────────────────┘
             │
┌─────────────────────────┐
│   Records screened      │
│      (n = 1597)         │
└─────────────────────────┘
             │
     ┌───────┴───────┐
┌──────────────┐ ┌──────────────────────┐
│   Records    │ │  Full-text articles  │
│   excluded   │ │ assessed for         │
│  (n=1551)    │ │   eligibility        │
│              │ │     (n =46)          │
└──────────────┘ └──────────────────────┘
                         │
              ┌──────────┴──────────┐
┌──────────────────────┐ ┌──────────────────┐
│ Eligible papers      │ │  Papers excluded │
│ included in review   │ │     (n=32)       │
│      (n= 14)         │ │                  │
└──────────────────────┘ └──────────────────┘
```

Did not measure PPC as outcome (n=16)

Not English paper (n=1)

Not EI/attachment as predictor (n=5)

Not medical student/doctor population (n=10)

Appendix 2: Ethical Approval Letters

1 Study 1

1.1 Ethical Approval Letter: Study 1

UNIVERSITY OF
LIVERPOOL

School of Medical Education

Faculty of Medicine
Cedar House
Ashton Street
Liverpool
L69 3GE

T: 0151 795 4356
F: 0151 794 8763
W: www.liv.ac.uk

Dr Helen O'Sullivan
CETL Director
School of Medical Education
Cedar House
Ashton Street
Liverpool
L69 3GE
5 March 2010

Dear Dr O'Sullivan

Re: Ethics approval for study 201001058- An investigation of attachment styles, emotional intelligence and clinical communication in 1st year medical students

I am pleased to inform you that you have been given ethical approval for the above study subject to the following mandatory condition –

- Consent materials provided to the students and measures to ensure confidentiality should be forwarded to the committee. Students need to be assured of the separation of research materials and exam marking.

If you have any queries please let me know,

Kind regards

Louise Jaeger

Louise Jaeger
Research Sub-group Secretary.

E: Jaegerl@liverpool.ac.uk
T: 0151 795 4356

2 Study 2

2.1 Ethical Approval Letter: Study 2

Institute of Psychology, Health and Society

Waterhouse Building, 2nd Floor Block B
1-5 Brownlow Street
Liverpool
L69 3GL

T 0151 794 8041
E iphsrec@liverpool.ac.uk

www.liv.ac.uk

20th May 2011

Dear Helen,

I am pleased to inform you that the Institute of Psychology, Health and Society Research Ethics Committee (REC) has approved your application for ethical approval. Details and conditions of the approval can be found below:

Applicant Name: Gemma Cherry
Ref. No: IPHS010
Supervisor: Dr Helen O'Sullivan
Title: An investigation of attachment styles, emotional intelligence and clinical communication in 2nd year medical students
Date of email approval: 19th May, 2011
The application was APPROVED subject to the following conditions:

Conditions

1. Mandatory: all serious adverse events must be reported to the Institute REC within 24 hours of their occurrence, via Lindsay Edmonds, IPHS Ethics Secretary (ledmonds@liverpool.ac.uk) and the Research Governance Officer (ethics@liverpool.ac.uk).

This approval applies for the duration of the research. If it is proposed to extend the duration of the study as specified in the application form, the Institute REC should be notified. If it is proposed to make any amendment to the research, you should notify the Institute REC by following the procedure found on the ethics web pages at the following link: http://www.liv.ac.uk/researchethics/localpolicy.htm

Yours sincerely

Chair of PHS Institute Research Ethics Committee

3 Study 3

3.1 Ethical Approval Letters: Study 3

NHS

National Research Ethics Service

North West 2 Research Ethics Committee – Liverpool Central

3rd Floor
Barlow House
4 Minshull Street
Manchester
M1 3DZ

Telephone: 0161 625 7818
Facsimile: 0161 237 9427

23 September 2010

Dr Helen O'Sullivan
Director, Centre for Excellence in Evidence Based Learning and Teaching (CEEBLT)
The University of Liverpool
School of Medical Education
Faculty of Medicine
Cedar House, Ashton Street
L693GE

Dear Dr O'Sullivan

Study Title: **An investigation of Foundation doctors' emotional intelligence and communication skills with patients**
REC reference number: **10/H1005/64**

Thank you for your letter of 22 September 2010, responding to the Committee's request for further information on the above research and submitting revised documentation.

The further information has been considered on behalf of the Committee by the Vice-Chair.

Confirmation of ethical opinion

On behalf of the Committee, I am pleased to confirm a favourable ethical opinion for the above research on the basis described in the application form, protocol and supporting documentation as revised, **subject to the conditions specified below.**

Ethical review of research sites

The favourable opinion applies to all NHS sites taking part in the study, subject to management permission being obtained from the NHS/HSC R&D office prior to the start of the study (see "Conditions of the favourable opinion" below).

Conditions of the favourable opinion

The favourable opinion is subject to the following conditions being met prior to the start of the study.

Management permission or approval must be obtained from each host organisation prior to the start of the study at the site concerned.

For NHS research sites only, management permission for research ("R&D approval") should be obtained from the relevant care organisation(s) in accordance with NHS research governance arrangements. Guidance on applying for NHS permission for research is available in the Integrated Research Application System or at http://www.rdforum.nhs.uk.

National Research Ethics Service

North West 2 Research Ethics Committee – Liverpool Central

3rd Floor
Barlow House
4 Minshull Street
Manchester
M1 3DZ

Telephone: 0161 625 7830

28 September 2010

Dr Helen O'Sullivan
Director, Centre for Excellence in Evidence Based Learning and Teaching (CEEBLT)
The University of Liverpool
School of Medical Education
Faculty of Medicine
Cedar House, Ashton Street
L693GE

Dear Dr O'Sullivan

Full title of study:	**An investigation of Foundation doctors' emotional intelligence and communication skills with patients**
REC reference number:	**10/H1005/64**
Protocol number:	n/a
EudraCT number:	

Thank you for your email of 27th September 2010. I can confirm the REC has received the documents listed below as evidence of compliance with the approval conditions detailed in our letter dated 23 September 2010. Please note these documents are for information only and have not been reviewed by the committee.

Documents received

The documents received were as follows:

Document	Version	Date
Letter of invitation to participant	1.1	15 September 2010
Participant Information Sheet	1.5	18 September 2010

You should ensure that the sponsor has a copy of the final documentation for the study. It is the sponsor's responsibility to ensure that the documentation is made available to R&D offices at all participating sites.

10/H1005/64	**Please quote this number on all correspondence**

Yours sincerely

[signature]

Miss Rowen Callaghan
Assistant Co-ordinator

E-mail: rowen.callaghan@northwest.nhs.uk

This Research Ethics Committee is an advisory committee to North West Strategic Health Authority

The National Research Ethics Service (NRES) represents the NRES Directorate within the National Patient Safety Agency and Research Ethics Committees in England

315

3.2 Local Research & Development Approval Letter: Study 3

Please contact: Dr S J Agius

Direct Line: 0161 625 7668
Fax: 0161 625 7503
Email: s.agius@nwpgmd.nhs.uk

Miss Gemma Cherry
Centre for Excellence in Developing
Professionalism (CETL)
School of Medical Education
University of Liverpool
Room 4.29
Cedar House
Ashton Street
Liverpool
L69 3GE

30th September 2010

Dear Miss Cherry

Re: Foundation doctors' attachment styles, emotional intelligence and communication skills with patients

I write to confirm that your application for R&D organisational approval by NHS North West Strategic Health Authority to conduct the above research study has been approved.

You may now proceed with the research, subject to securing favourable ethical review if required.

Best wishes.

Yours sincerely

Dr Steven J Agius
Senior Research Fellow

Appendix 3: Copies of Questionnaires and Measures[98]

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1 The Experience in Close Relationships: Short Form

The following statements concern how you feel in romantic relationships. We are interested in how you generally experience relationships, not just in what is happening in a current relationship. Respond to each statement by indicating how much you agree or disagree with it. Mark your answer using the following rating scale:

1	2	3	4	5	6	7
Strongly disagree	Disagree	Slightly disagree	Neutral	Slightly agree	Agree	Strongly agree

	Statement	Answer
1.	It helps to turn to my romantic partner in times of need	
2.	I need a lot of reassurance that I am loved by my partner	
3.	I want to get close to my partner, but I keep pulling back	
4.	I find that my partner(s) don't want to get as close as I would like	
5.	I turn to my partner for many things, including comfort and reassurance	
6.	My desire to be very close sometimes scares people away	
7.	I try to avoid getting too close to my partner	
8.	I do not often worry about being abandoned	
9.	I usually discuss my problems and concerns with my partner	
10.	I get frustrated if romantic partners are not available when I need them	
11.	I am nervous when partners get too close to me	
12.	I worry that romantic partners won't care about me as much as I care about them	

2 The Liverpool Undergraduate Communication Assessment Scale

LIVERPOOL UNDERGRADUATE COMMUNICATION ASSESSMENT SCALE (LUCAS)

INTRODUCTIONS

	Competent		Unacceptable
A) Greeting & introduction	i) greets patient, ii) states full name, iii) job title, iv) provides brief explanation why s/he is approaching the pt ☐		Omission of **any** of elements i)-iv) ☐
B) Identity check	i) checks patient's full name; ii) one other identifier (e.g. patient's D.O.B., address etc.) ☐		Omission of **either** i) **or** ii) ☐

GENERAL

	Competent	Borderline	Unacceptable
C) Audibility & clarity of speech	☐	☐	☐
D) Non-verbal behaviour Includes eye-contact, positioning, posture, facial expressions, gestures & mannerisms	☐	☐	☐
E) Questions, prompts and/or explanations Includes: i) exploration of pt's needs, feelings and concerns & ii) comprehensibility of Qs/explanation **(N.B. this item is *not* to assess the *medical* content of history taking, which is rated in other OSCE stations, or on separate mark sheets)**	☐	☐	☐
F) Empathy & responsiveness Includes adaptation & sensitivity to patient's needs	☐	☐	☐
G) Clarification & summarising Includes elicitation of pt's queries	☐	☐	☐
H) Consulting style & organisation Includes orderliness of the consultation, balance of open and closed Qs and time management	☐	☐	☐

PROFESSIONAL BEHAVIOUR AND CONDUCT

	Competent		Unacceptable
I) Professional behaviour	E.g. courteous, kind, thoughtful behaviour ☐		E.g. overly casual, disinterested, discourteous or thoughtless behaviour ☐
J) Professional spoken/verbal conduct	Remarks are: i) respectful & ii) avoid major inaccuracy & iii) within own competence & iv) reassurance is appropriate ☐		Remarks are: i) disrespectful OR ii) contain major inaccuracy OR iii) outside own competence OR iv) reassurance is inappropriate ☐

	Outstanding	Very good	Competent	Borderline pass	Borderline fail	Not yet competent	Not competent
Please indicate the student's overall performance	☐	☐	☐	☐	☐	☐	☐

3 **The Modified Liverpool Undergraduate Communication Assessment Scale (Station 1: Gastro-Intestinal Bleed)**

GI bleed - lower

10/11							Student No 9				
Please greet the student with the instructions on the sheet provided							**Examiner Rest**				
(barcode) 9 9 9 9							**01 Thur am**				
Please DO NOT write in this box (office use only)											

Please mark the relevant box for each component with a cross as shown ⊠	Performed adequately and completely		Attempted but incomplete or inadequate		Not attempted or done incorrectly	
Introduces self and indicates their status	4 ☐		2 ☐		0 ☐	
Checks patient identity (Name & Date of Birth)	4 ☐		2 ☐		0 ☐	
Gains consent for the history	4 ☐				0 ☐	

Elicits Current Problem:

		6	5	4	3	2	1	0
• Loose stool for 2 days • Started with very dark brown stool • Episode of melaena (black, tarry stool) overnight	• 2 further episodes • Assesses volume of melaena • No fresh blood	18 ☐	15 ☐	12 ☐	9 ☐	6 ☐	3 ☐	0 ☐

		7	6	5	4	3	2	1	0
• Epigastric pain • Continuous pain since started vomiting • Deep ache • No radiation	• No vomiting • No rectal bleeding • No dysphagia	21 ☐	18 ☐	15 ☐	12 ☐	9 ☐	6 ☐	3 ☐	0 ☐

		5	4	3	2	1	0
• Had epigastric pains for 6/12 • Usually after meals • Sensation of fullness/bloated after meals	• Tests arranged by GP • Seen GP about it	10 ☐	8 ☐	6 ☐	4 ☐	2 ☐	0 ☐

Review of systems

				5	4	3	2	1	0
• CVS • RS	• GU • CNS	• MS / joints		10 ☐	8 ☐	6 ☐	4 ☐	2 ☐	0 ☐

Other history:

		9	8	7	6	5	4	3	2	1	0
• No past medical problems • Drinks 2 pints per week • Ex smoker • Smoked 20/day • Gave up 5 years ago	• Works as a bus driver • Father died of an MI • Father died aged 67 • Mother died aged 72	18 ☐	16 ☐	14 ☐	12 ☐	10 ☐	8 ☐	6 ☐	4 ☐	2 ☐	0 ☐

	Excellent	Satisfactory	Borderline	Poor	Very poor
Elicits patient's ideas, concerns and expectations (e.g. wants them to read notes instead of asking questions, hates being incapacitated, doesn't like hospitals, worried about losing so much blood, pain is frustrating, thought having a camera test, wants diagnosis and how will be treated)	20 ☐	15 ☐	10 ☐	5 ☐	0 ☐
Demonstrates active listening skills (e.g. appears interested in answers, doesn't repeat question etc)	16 ☐	12 ☐	8 ☐	4 ☐	0 ☐
Demonstrates empathy and responds appropriately to patient's emotions (e.g. realises patient frustrated answering questions repeatedly, empathises, explains purpose of queries and establishes rapport)	16 ☐	12 ☐	8 ☐	4 ☐	0 ☐
Appropriate use of questions (Good balance and use of open and closed questions. No leading questions.)	16 ☐	12 ☐	8 ☐	4 ☐	0 ☐
Effective non-verbal behaviour	16 ☐	12 ☐	8 ☐	4 ☐	0 ☐
Conversational summarising and clarification when necessary	16 ☐	12 ☐	8 ☐	4 ☐	0 ☐
Candidate's consulting style (structure & organisation)	11 ☐	8.25 ☐	5.5 ☐	2.75 ☐	0 ☐

	Excellent	Satisfactory	Borderline	Poor	Very poor
Indicate the student's professional attitude and approach to the patient and the procedure	4 ☐	3 ☐	2 ☐	1 ☐	0 ☐

	Outstanding	Very good	Competent	Borderline pass	Borderline fail	Not yet competent	Not competent
Please indicate the student's overall performance	6 ☐	5 ☐	4 ☐	3 ☐	2 ☐	1 ☐	0 ☐

418

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4 The Modified Liverpool Undergraduate Communication Assessment Scale (Station 2: Bone Scan)

DEXA bone scan result (10 min station)

31/32

Student No. 30

Please do not write in this box for office use only

	01 Wed am		

Please mark the relevant box for each component with a cross as shown ☒	Performed adequately and completely	Attempted but incomplete or inadequate	Not attempted or grossly incorrect
Introduces self to patient and explains their role	4 ☐	2 ☐	6 ☐
Confirms identity of patient (name & DOB)	4 ☐	2 ☐	0 ☐
Gains consent for interview	4 ☐		0 ☐
Elicits current issue (had recent DEXA scan which showed osteopenia and would like more information)	5 ☐	2·5 ☐	0 ☐

Elicits information about patient's risk factors in order to tailor advice appropriately:

- Early menopause (aged 42) or hysterectomy (aged 41)*
- No HRT
- No steroids
- No medical conditions
- No history of fractures
- Patient's smoking history
- Patient's alcohol intake
- Family history of osteoporosis or fracture
- Patient's exercise habits

9	8	7	6	5	4	3	2	1	0
☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
45	40	35	30	25	20	15	10	5	0

*Depending on scenario being used today

	Excellent	Satisfactory	Borderline	Poor	Very poor or not done
Explains result (osteopenia) correctly	20 ☐	15 ☐	10 ☐	5 ☐	0 ☐
Gives appropriate advice regarding reducing risk factors (e.g. smoking cessation, weight bearing exercise etc)	20 ☐	15 ☐	10 ☐	5 ☐	0 ☐
All explanations / information is understandable (e.g. no unexplained jargon etc)	30 ☐	22·5 ☐	15 ☐	7·5 ☐	0 ☐
Information is tailored to patient's needs / risk	20 ☐	15 ☐	10 ☐	5 ☐	0 ☐
Appropriate use of open and closed questions throughout the consultation	15 ☐	11·25 ☐	7·5 ☐	3·75 ☐	0 ☐
Uses conversational summarising and clarifies where appropriate (has awareness of areas of potential misunderstanding)	15 ☐	11·25 ☐	7·5 ☐	3·75 ☐	0 ☐
Effective non-verbal behaviour	10 ☐	7·5 ☐	5 ☐	2·5 ☐	0 ☐
Structure and time management, including appropriate closing of the consultation	8 ☐	6 ☐	4 ☐	2 ☐	0 ☐

	Excellent	Satisfactory	Borderline	Poor	Very Poor
Please indicate the student's professional attitude and approach	☐ 4	☐ 3	☐ 2	☐ 1	☐ 0

	Outstanding	Very good	Competent	Borderline pass	Borderline fail	Not yet competent	Not competent
Please indicate the student's overall performance	☐ 6	☐ 5	☐ 4	☐ 3	☐ 2	☐ 1	☐ 0

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5 The Modified Liverpool Undergraduate Communication Assessment Scale (Station 3: Lifestyle Advice)

Lifestyle advice – fall (10 min station)

31/32

Student No. 30

01 Wed am

Please mark the relevant box for each component with a cross as shown ☒	Performed adequately and completely	Attempted but incomplete or inadequate	Not attempted or grossly incorrect
Introduces self to patient and explains their role	4 ☐	2 ☐	0 ☐
Confirms identity of patient (name & DOB)	4 ☐	2 ☐	0 ☐
Gains consent for interview	4 ☐		0 ☐

Elicits information about fall / injury

- Fall 3 days ago
- Hurt wrist or elbow*
- Mechanism of fall = Slip
- No LOC / blackout
- No other symptoms (e.g. chest pain)
- No previous falls
- Seen in A&E
- Xray nad
- Patient had been drinking alcohol that evening

*Depending on day of exam

9	8	7	6	5	4	3	2	1	0
☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
27	24	21	18	15	12	9	6	3	0

	Performed adequately and completely	Attempted but incomplete or inadequate	Not attempted or grossly incorrect
Quantifies and explores patients alcohol consumption in detail (amount drunk, what type of alcohol, pattern etc)	18 ☐	9 ☐	0 ☐
Explores possible negative effects of alcohol consumption (e.g. forensic history, days off work etc)	10 ☐	5 ☐	0 ☐
Assesses patient's tolerance and dependence on alcohol	12 ☐	6 ☐	0 ☐
Assesses patient's ideas and willingness to stopping drinking	12 ☐	6 ☐	0 ☐

Elicits other sections of history:

Elicits social situation (job, living circumstances, how spends free time / socialising etc)	10 ☐	5 ☐	0 ☐

• Review of systems • PMH	• Medication history • Family history	4	3	2	1	0
		8 ☐	6 ☐	4 ☐	2 ☐	0 ☐

	Excellent	Satisfactory	Borderline	Poor	Very poor or not done
Demonstrates active listening skills	12 ☐	9 ☐	6 ☐	3 ☐	0 ☐
Explores patient's alcohol consumption in a sensitive manner (empathetic, non-judgemental etc)	14 ☐	10.5 ☐	7 ☐	3.5 ☐	0 ☐
Counsels appropriately regarding excess alcohol intake	14 ☐	10.5 ☐	7 ☐	3.5 ☐	0 ☐
Explanation / information is understandable	12 ☐	9 ☐	6 ☐	3 ☐	0 ☐
Appropriate use of open and closed questions throughout the consultation	10 ☐	7.5 ☐	5 ☐	2.5 ☐	0 ☐
Uses conversational summarising and clarifies where appropriate (has awareness of areas of potential misunderstanding)	10 ☐	7.5 ☐	5 ☐	2.5 ☐	0 ☐
Effective non-verbal behaviour	10 ☐	7.5 ☐	5 ☐	2.5 ☐	0 ☐
Structure and time management, including appropriate closing of the consultation	9 ☐	6.75 ☐	4.5 ☐	2.25 ☐	0 ☐

	Excellent	Satisfactory	Borderline	Poor	Very Poor
Please indicate the student's professional attitude and approach	4 ☐	3 ☐	2 ☐	1 ☐	0 ☐

	Outstanding	Very good	Competent	Borderline pass	Borderline fail	Not yet competent	Not competent
Please indicate the student's overall performance	6 ☐	5 ☐	4 ☐	3 ☐	2 ☐	1 ☐	0 ☐

PATIENT ID NUMBER:

<div align="right">Form S</div>

Doctors' communication skills with patients

<u>Communication Assessment Tool</u>

Communication with patients is a very important part of quality medical care. We would like to know how you feel about the way your doctor communicated with you. Your answers are completely confidential, so please be as open and honest as you can. Thank you very much.

1	**2**	**3**	**4**	**5**
poor	**fair**	**good**	**very good**	**excellent**

Please use this scale to rate the doctor's communication with you, and circle your answer for each item below.

<u>The doctor</u> poor excellent

1.	Greeted me in a way that made me feel comfortable	1 2 3 4 5
2.	Treated me with respect	1 2 3 4 5
3.	Showed interest in my ideas about my health	1 2 3 4 5
4.	Understood my main health concerns	1 2 3 4 5
5.	Paid attention to me (looked at me, listened carefully)	1 2 3 4 5
6.	Let me talk without interruptions	1 2 3 4 5
7.	Gave me as much information as I wanted	1 2 3 4 5
8.	Talked in terms I could understand	1 2 3 4 5
9.	Checked to be sure I understood everything	1 2 3 4 5
10.	Encouraged me to ask questions	1 2 3 4 5
11.	Involved me in decisions as much as I wanted	1 2 3 4 5
12.	Discussed next steps, including any follow-up plans	1 2 3 4 5
13.	Showed care and concern	1 2 3 4 5
14.	Spent the right amount of time with me	1 2 3 4 5
15.	I would recommend this doctor to a friend	1 2 3 4 5

Version 1.1
7th November 2008

This set of questions is for statistical purposes. Your own responses are completely confidential. Please mark one answer for each question.

16. How old are you?
- $\square_1$ 24 or younger
- $\square_2$ 25-44
- $\square_3$ 45-64
- $\square_4$ 65-84
- $\square_5$ 85 or older

17. Are you male or female?
- $\square_1$ Male
- $\square_2$ Female

18. Have you seen this doctor before?
- $\square_1$ No
- $\square_2$ Yes, but only once
- $\square_3$ Yes, more than once

19. How would you rate your health?
- $\square_1$ Poor
- $\square_2$ Fair
- $\square_3$ Good
- $\square_4$ Very Good
- $\square_5$ Excellent

Thank you very much.

Version 1.1
7th November 2008

Appendix 4: Information Sheets and Consent Forms

1 Study 1

1.1 Participant Information Sheet

UNIVERSITY OF LIVERPOOL

An investigation of attachment styles, emotional intelligence and clinical communication in 1st year medical students

You are being invited to take part in a research study. Before you decide it is important for you to understand why the research is being done and what it will involve. Please take time to read the following information carefully. Please ask if there is anything that is not clear or if you would like more information. We would like to stress that you do not have to accept this invitation and should only agree to take part if you want to. Thank you for reading this.

What is the purpose of the study?

Researchers have identified that communication is an important factor in medical consultations. We want to see whether your attachment style or emotional intelligence influence your communication. We will do this by relating them to your OSCE scores and by investigating differences on ratings of communication skills. We will use a coding scheme that codes speech. For this reason we need to video record one 5-minute station in your summative OSCE examination.

Why have I been chosen to take part?

We have chosen the 1st year summative OSCE because it assesses communication skills.

What will happen if I take part?

We will video record one 5-minute station in your summative OSCE examination. **Please note** to minimise disruption during the summative OSCEs, all students will be videoed during this station regardless of their decision to consent. Only if you decide to participate in the study and sign the Consent form will your video be coded and your OSCE scores be obtained. If you do not wish to participate, your OSCE scores will not be used for research, your video will not be viewed by anyone and it will be destroyed following the OSCE.

The investigators are Miss Gemma Cherry and Dr Helen O'Sullivan, Medical Education, Dr Ian Fletcher, Division of Clinical Psychology. Gemma Cherry will be distributing the questionnaires and will attend the OSCEs.

Do I have to take part?

Participation is voluntary and you are free to withdraw at any time without giving any reason. If you do not complete the consent form your video will not viewed by anyone and it will be destroyed following the OSCE.

Are there any risks in taking part?

There are no perceived risks in participating in this study.

Are there any benefits in taking part?

There are no personal benefits in participating in the investigation. However, the data from the study is intended to assist the future communication skills teaching for medical students at Liverpool.

What if I am unhappy or there is a problem?

If you are unhappy, or if there is a problem, please feel free to let us know by contacting Miss Gemma Cherry. Any complaint about the *way* you have been dealt with during this study will be addressed in the first instance by Reverend Dr David Taylor, 0151 794 8747, email dcmt@liverpool.ac.uk. He will also notify the University Research Governance Officer.

Will my participation be kept confidential?

Yes. All the videos will be marked with a unique number to ensure anonymity. The videos will be kept securely stored at all times and all the information collected during this study will be kept strictly confidential. This means that only the researchers will view the videos. No staff involved in your medical training will be allowed to have access to the videos. You will not be named or identified in any reports of the study. We may include brief written quotations from interviews in future publications, but, we will always change details so that nobody can be identified.

Will my taking part be covered by an insurance scheme?

Participants in a University of Liverpool ethically approved study have insurance cover.

What will happen to the results of the study?

We intend to submit the results of the investigation for publication.

What will happen if I want to stop taking part?

You can withdraw from the investigation at any time without giving an explanation.

Who can I contact if I have further questions?
Miss Gemma Cherry. 0151 7954332. m.g.cherry@liverpool.ac.uk

UNIVERSITY OF
LIVERPOOL

CONSENT FORM - students

Title of Research Project:	An investigation of attachment styles, emotional intelligence and clinical communication in 1st year medical students
Researcher(s):	G Cherry I Fletcher H O'Sullivan

Please initial box

1. I confirm that I have read and have understood the information sheet for the above study. I have had the opportunity to consider the information, ask questions and have had these answered satisfactorily.

2. I understand that my participation is voluntary and that I am free to withdraw at any time without giving any reason, without my rights being affected.

3. I understand that, under the Data Protection Act, I can at any time ask for access to the information I provide and I can also request the destruction of that information if I wish.

4. I agree for my videoed OSCE, OSCE scores and demographic information to be made available to the researchers and to take part in the above study.

_____   _____   _____

Participant Name   Date   Signature

_____   _____   _____

Researcher taking consent   Date   Signature

The contact details of the lead researcher are:
Miss Gemma Cherry, School of Medical Education. 0151 7954332.
m.g.cherry@liverpool.ac.uk
Thank you very much for your time and cooperation

1.3 **Simulated Patient Information Sheet**

UNIVERSITY OF
LIVERPOOL

An investigation of attachment styles, emotional intelligence and clinical communication in 1st year medical students

You are being invited to take part in a research study. Before you decide it is important for you to understand why the research is being done and what it will involve. Please take time to read the following information carefully. Please ask if there is anything that is not clear or if you would like more information. We would like to stress that you do not have to accept this invitation and should only agree to take part if you want to. Thank you for reading this.

What is the purpose of the study?

Researchers have identified that communication is an important factor in medical consultations. We want to see whether students' attachment styles or emotional intelligence influence their communication. We will do this by relating these variables to their OSCE scores and by investigating differences on ratings of communication skills. We will use a coding scheme that codes speech. For this reason we need to video record one 5-minute station in the summative OSCE examination.

What will happen if I take part?

We will video record the students interviewing you in one of the 5-minute summative OSCE stations. We will ensure that you will not be in camera shot during the recording, although your voice will be recorded. Only the videoed simulated interviews will be viewed and coded by the researchers, any conversation that takes place outside of the simulated interviews will be deleted following the OSCEs. To minimise disruption during the summative OSCE, all the students will be videoed during this station.

The investigators are Miss Gemma Cherry and Dr Helen O'Sullivan, Medical Education, Dr Ian Fletcher, Division of Clinical Psychology. Gemma Cherry will be distributing the questionnaires and will attend the OSCEs.

Do I have to take part?

Your participation is voluntary.

Are there any risks in taking part?

There are no perceived risks in participating in this study.

Are there any benefits in taking part?

There are no personal benefits in participating in the investigation. However, the data from the study is intended to assist the future communication skills teaching for medical students at Liverpool.

What if I am unhappy or there is a problem?

If you are unhappy, or if there is a problem, please feel free to let us know by contacting Miss Gemma Cherry. Any complaint about the *way* you have been dealt with during this study will be addressed in the first instance by Reverend Dr David Taylor, 0151 794 8747, email dcmt@liverpool.ac.uk. He will also notify the University Research Governance Officer.

Will my participation be kept confidential?

Yes. All the videos will be marked with a unique number to ensure anonymity. The videos will be kept securely stored at all times and all the information collected during this study will be kept strictly confidential. This means that only the researchers will view the videos. You will not be named or identified in any reports of the study. We may include brief written quotations from interviews in future publications, but, we will always change details so that nobody can be identified.

Will my taking part be covered by an insurance scheme?

Participants in a University of Liverpool ethically approved study have insurance cover.

What will happen to the results of the study?

We intend to submit the results of the investigation for publication.

What will happen if I want to stop taking part?

You can withdraw from the investigation at any time without giving an explanation.

Who can I contact if I have further questions?

Miss Gemma Cherry. 0151 7954332. m.g.cherry@liverpool.ac.uk

1.4 **Simulated Patient Consent Form**

UNIVERSITY OF
LIVERPOOL

CONSENT FORM – Simulated Patients

Title of Research Project:	An investigation of attachment styles, emotional intelligence and clinical communication in 1st year medical students
Researcher(s):	G Cherry I Fletcher H O'Sullivan

Please initial box

- I confirm that I have read and have understood the information sheet for the above study. I have had the opportunity to consider the information, ask questions and have had these answered satisfactorily.

- I understand that my participation is voluntary and that I am free to withdraw at any time without giving any reason, without my rights being affected.

- I understand that, under the Data Protection Act, I can at any time ask for access to the information I provide and I can also request the destruction of that information if I wish.

- I agree to take part in the above study.

_____   _____   _____

Participant name   Date   Signature

_____   _____   _____

Name of researcher taking consent   Date   Signature

The contact details of the lead researcher are:
Miss Gemma Cherry, School of Medical Education. 0151 7954332.
m.g.cherry@liverpool.ac.uk
Thank you very much for your time and cooperation

2   Study 2

2.1   Participant Information Sheet

UNIVERSITY OF
LIVERPOOL

An investigation of attachment styles, emotional intelligence and clinical communication in 2nd year medical students

You are being invited to take part in a research study. Before you decide it is important for you to understand why the research is being done and what it will involve. Please take time to read the following information carefully. Please ask if there is anything that is not clear or if you would like more information. We would like to stress that you do not have to accept this invitation and should only agree to take part if you want to. Thank you for reading this.

What is the purpose of the study?

Researchers have identified that communication is an important factor in medical consultations. We want to see whether your attachment style or emotional intelligence influence your communication. We will do this by relating them to your OSCE scores and by investigating differences on ratings of communication skills. We will use a coding scheme that codes speech. For this reason we need to video record one 10-minute station in your summative OSCE examination.

Why have I been chosen to take part?

We have chosen the 2nd year summative OSCE because it assesses communication skills.

What will happen if I take part?

We will video record one 10-minute station in your summative OSCE examination. **Please note** to minimise disruption during the summative OSCEs, all students will be videoed during this station regardless of their decision to consent. Only if you decide to participate in the study and sign the Consent form will your video be coded and your OSCE scores be obtained. If you do not wish to participate, your OSCE scores will not be used for research, your video will not be viewed by anyone and it will be destroyed following the OSCE.

The investigators are:
Miss Gemma Cherry and Dr Helen O'Sullivan, Medical Education
Dr Ian Fletcher, Division of Clinical Psychology
Gemma Cherry will be distributing the questionnaires and will attend the OSCEs.

Do I have to take part?

Participation is voluntary and you are free to withdraw at any time without giving any reason. If you do not complete the consent form your video will not viewed by anyone and it will be destroyed following the OSCE.

Are there any risks in taking part?

There are no perceived risks in participating in this study.

Are there any benefits in taking part?

There are no personal benefits in participating in the investigation. However, the data from the study is intended to assist the future communication skills teaching for medical students at Liverpool.

What if I am unhappy or there is a problem?

If you are unhappy, or if there is a problem, please feel free to let us know by contacting Miss Gemma Cherry. Any complaint about the *way* you have been dealt with during this study will be addressed in the first instance by Reverend Dr David Taylor, 0151 794 8747, email dcmt@liverpool.ac.uk. He will also notify the University Research Governance Officer.

Will my participation be kept confidential?

Yes. All the videos will be marked with a unique number to ensure anonymity. The videos will be kept securely stored at all times and all the information collected during this study will be kept strictly confidential. This means that only the researchers will view the videos. No staff involved in your medical training will be allowed to have access to the videos. You will not be named or identified in any reports of the study. We may include brief written quotations from interviews in future publications, but, we will always change details so that nobody can be identified.

Will my taking part be covered by an insurance scheme?

Participants in a University of Liverpool ethically approved study have insurance cover.

What will happen to the results of the study?

We intend to submit the results of the investigation for publication.

What will happen if I want to stop taking part?

You can withdraw from the investigation at any time without giving an explanation.

Who can I contact if I have further questions?
Miss Gemma Cherry. 0151 7954332. m.g.cherry@liverpool.ac.uk

2.2 Participant Consent Form

UNIVERSITY OF LIVERPOOL

CONSENT FORM - students

Title of Research Project:	An investigation of attachment styles, emotional intelligence and clinical communication in 2nd year medical students
Researcher(s):	G Cherry I Fletcher H O'Sullivan

Please initial box

1. I confirm that I have read and have understood the information sheet for the above study. I have had the opportunity to consider the information, ask questions and have had these answered satisfactorily.

2. I understand that my participation is voluntary and that I am free to withdraw at any time without giving any reason, without my rights being affected.

3. I understand that, under the Data Protection Act, I can at any time ask for access to the information I provide and I can also request the destruction of that information if I wish.

4. I agree for my videoed OSCE, OSCE scores and demographic information to be made available to the researchers and to take part in the above study.

_____   _____   _____

Participant name   Date   Signature

_____   _____   _____

Name of researcher taking consent   Date   Signature

The contact details of the lead researcher are:
Miss Gemma Cherry, School of Medical Education. 0151 7954332.
m.g.cherry@liverpool.ac.uk
Thank you very much for your time and cooperation

UNIVERSITY OF
LIVERPOOL

An investigation of attachment styles, emotional intelligence and clinical communication in 2nd year medical students

You are being invited to take part in a research study. Before you decide it is important for you to understand why the research is being done and what it will involve. Please take time to read the following information carefully. Please ask if there is anything that is not clear or if you would like more information. We would like to stress that you do not have to accept this invitation and should only agree to take part if you want to. Thank you for reading this.

What is the purpose of the study?

Researchers have identified that communication is an important factor in medical consultations. We want to see whether students' attachment styles or emotional intelligence influence their communication. We will do this by relating them to OSCE scores and by investigating differences on ratings of communication skills. We will use a coding scheme that codes speech. For this reason we need to video record one 10-minute station in the summative OSCE examination.

Why have I been chosen to take part?

We have chosen the 2nd year summative OSCE because it assesses communication skills, and they will be interviewing you as a simulated patient.

What will happen if I take part?

We will video record the students interviewing you in one 10-minute communication station OSCE station. We will ensure that you will not be in camera shot during the recording, although your voice will be recorded. Only the videoed simulated interviews will be viewed and coded by the researchers, any conversation that takes place outside of the simulated interviews will be deleted following the OSCEs. To minimise disruption during the summative OSCE, all the students will be videoed during this station.

The investigators are:
Miss Gemma Cherry and Dr Helen O'Sullivan, Medical Education
Dr Ian Fletcher, Division of Clinical Psychology
Gemma Cherry will be distributing the questionnaires and will attend the OSCEs.

Do I have to take part?

Your participation is voluntary.

Are there any risks in taking part?

There are no perceived risks in participating in this study.

Are there any benefits in taking part?

There are no personal benefits in participating in the investigation. However, the data from the study is intended to assist the future communication skills teaching for medical students at Liverpool.

What if I am unhappy or there is a problem?

If you are unhappy, or if there is a problem, please feel free to let us know by contacting Miss Gemma Cherry. Any complaint about the way you have been dealt with during this study will be addressed in the first instance by Reverend Dr David Taylor, 0151 794 8747, email dcmt@liverpool.ac.uk. He will also notify the University Research Governance Officer.

Will my participation be kept confidential?

Yes. All the videos will be marked with a unique number to ensure anonymity. The videos will be kept securely stored at all times and all the information collected during this study will be kept strictly confidential. This means that only the researchers will view the videos. You will not be named or identified in any reports of the study. We may include brief written quotations from interviews in future publications, but, we will always change details so that nobody can be identified.

Will my taking part be covered by an insurance scheme?

Participants in a University of Liverpool ethically approved study have insurance cover.

What will happen to the results of the study?

We intend to submit the results of the investigation for publication.

What will happen if I want to stop taking part?

You can withdraw from the investigation at any time without giving an explanation.

Who can I contact if I have further questions?
Miss Gemma Cherry. 0151 7954332. m.g.cherry@liverpool.ac.uk

2.4 Simulated Patient Consent Form

UNIVERSITY OF LIVERPOOL

CONSENT FORM – Simulated Patients

Title of Research Project:	An investigation of attachment styles, emotional intelligence and clinical communication in 2nd year medical students
Researcher(s):	G Cherry I Fletcher H O'Sullivan

Please initial box

1. I confirm that I have read and have understood the information sheet for the above study. I have had the opportunity to consider the information, ask questions and have had these answered satisfactorily.

2. I understand that my participation is voluntary and that I am free to withdraw at any time without giving any reason, without my rights being affected.

3. I understand that, under the Data Protection Act, I can at any time ask for access to the information I provide and I can also request the destruction of that information if I wish.

4. I agree to take part in the above study.

_____   _____   _____

Participant Name   Date   Signature

_____   _____   _____

Name of researcher taking consent   Date   Signature

The contact details of the lead researcher are:
Miss Gemma Cherry, School of Medical Education. 0151 7954332.
m.g.cherry@liverpool.ac.uk
Thank you very much for your time and cooperation

337

3   **Study 3**

3.1   **Participant Information Sheet (Doctors)**

UNIVERSITY OF
LIVERPOOL

**Foundation doctors' attachment style, emotional intelligence and
communication**

You are being invited to take part in a research study. Before you decide it is
important for you to understand why the research is being done and what it will
involve. Please take time to read the following information carefully. Please ask if
there is anything that is not clear or if you would like more information. We would
like to stress that you do not have to accept this invitation and should only agree to
take part if you want to. Thank you for reading this.

What is the purpose of the study?

Researchers have identified that communication is an important factor in medical
consultations. We want to see whether your communication skills are influenced by
your emotional intelligence or attachment style. We are exploring this by
investigating differences on ratings of communication skills. We will use a coding
scheme that codes speech. For this reason we would like to video record you
interacting with patients, in the form of routine consultations. We will do this by
video recording between 4 and 12 patient consultations, either one morning session
or one afternoon session.

Why have I been chosen to take part?

You have been chosen because you are a Foundation doctor. We have chosen routine
consultations with patients as they assess communication skills.

What will happen if I take part?

We will video record routine consultations with patients either on one morning
session or one afternoon session, within the GP surgery where you have been placed.
You will be videoed in between 4 and 12 patient consultations. Only if you decide to
participate in the study and sign the Consent form will your video be coded. If you
do not wish to participate, you will not be videoed. You will also be asked to
complete an emotional intelligence and attachment questionnaire. Please note **the
video camera will only be directed at you and the patient will not be in camera
shot at any time during the consultation. No physical examinations will be
videoed.** If the patient does not consent, then the consultation will not be video
recorded.
The investigators are Miss Gemma Cherry and Dr Helen O'Sullivan, Medical
Education, and Dr Ian Fletcher, Division of Clinical Psychology. Gemma Cherry
will be distributing the questionnaires and will attend the sessions.

Do I have to take part?

Participation is voluntary and you are free to withdraw at any time without giving any reason.

Are there any risks in taking part?

There are no perceived risks in participating in this study.

Are there any benefits in taking part?

You will be provided with proof of participation for use in your portfolio. The data from the study will be fed back into the medical curriculum at the University of Liverpool, and is intended to assist the future communication skills teaching for medical students studying there.

What if I am unhappy or there is a problem?

If you are unhappy, or if there is a problem, please feel free to let us know by contacting Miss Gemma Cherry. Any complaint about the way you have been dealt with during this study will be addressed in the first instance by the University Research Governance Officer.

Will my participation be kept confidential?

Yes. All the videos will be marked with a random number to ensure anonymity. The videos will be kept securely stored at all times and all the information collected during this study will be kept strictly confidential. This means that only the researchers will view the videos. No staff involved in your training will be allowed to have access to the videos. You will not be named or identified in any reports of the study. We may include brief written quotations from interviews in future publications, but, we will always change details so that nobody can be identified.

Will my taking part be covered by an insurance scheme?

Participants in a University of Liverpool ethically approved study have insurance cover.

What will happen to the results of the study?

We intend to submit the results of the investigation for publication.

What will happen if I want to stop taking part?

You can withdraw from the investigation at any time without giving an explanation.

Who can I contact if I have further questions?
Miss Gemma Cherry. 0151 7954332. m.g.cherry@liverpool.ac.uk

3.2 **Participant Consent Form (Doctors)**

UNIVERSITY OF
LIVERPOOL

CONSENT FORM - doctors

Title of Research Project:	Foundation doctors' attachment styles, emotional intelligence and communication with patients
Researcher(s):	G Cherry I Fletcher H O'Sullivan

Please initial box

1. I confirm that I have read and have understood the information sheet for the above study. I have had the opportunity to consider the information, ask questions and have had these answered satisfactorily.

2. I understand that my participation is voluntary and that I am free to withdraw at any time without giving any reason, without my rights being affected.

3. I understand that, under the Data Protection Act, I can at any time ask for access to the information I provide and I can also request the destruction of that information if I wish.

4. I agree for my videoed interviews and questionnaire data to be made available to the researchers and to take part in the above study.

_____   _____   _____

Participant Name   Date   Signature

_____   _____   _____

Name of researcher taking consent   Date   Signature

The contact details of the lead researcher are:
Miss Gemma Cherry, School of Medical Education. 0151 7954332.
m.g.cherry@liverpool.ac.uk.
Thank you very much for your time and cooperation

Foundation doctors' attachment styles, emotional intelligence and communication with patients

You are being invited to take part in a research study. Before you decide it is important for you to understand why the research is being done and what it will involve. Please take time to read the following information carefully. Please ask if there is anything that is not clear or if you would like more information. We would like to stress that you do not have to accept this invitation and should only agree to take part if you want to. Thank you for reading this.

What is the purpose of the study?

Researchers have identified that communication is an important factor in medical consultations, and we are interested in how communication relates to doctors' attachment styles and emotional intelligence. We want to see how doctors communicate with patients (you) in GP clinics, how the doctors' attachment styles or emotional intelligence influences communication, and your level of satisfaction with the doctors' communication. We are exploring these factors by videoing a doctor-patient interview, then rating the doctors' communication skills with an internationally agreed consensus coding scheme. For this reason we would appreciate your support to video record doctor-patient interviews in a GP clinic. You will also be asked to complete one brief questionnaire. Please note **the video camera will only be directed at the doctor and you will not be in camera shot at any time during the consultation.** This study has been reviewed and received NHS ethical approval. Ethical approval from the University of Liverpool has also been obtained from the Medical Education Research Ethics Committee and the Research Ethics Sub-Committee for Non-Invasive Interventions.

Why have I been chosen to take part?

You have been chosen as a possible participant as you are attending an appointment in a GP clinic where doctors who are training under the Mersey Deanery are routinely placed. We want to investigate the communication skills of these doctors.

What will happen if I take part?

We will video the doctor in a single doctor-patient consultation within the GP practice where you attend appointments. You will not be video recorded but your voice will be audio recorded on the video. No physical examinations will be videoed. No researchers will be present during videoed sessions between consenting parties. If

you decide to participate in the study the video will be viewed, coded and then destroyed. **If you decide not to participate, you will not be videoed.**
We will also ask you to complete one questionnaire (patient satisfaction) after the videoed session. This will take approximately 3-5 minutes.

The investigators are:
Miss Gemma Cherry, School of Medical Education, University of Liverpool
Dr Helen O'Sullivan, School of Medical Education, University of Liverpool
Dr Ian Fletcher, Division of Clinical Psychology

Gemma Cherry will be distributing the questionnaires and will be responsible for videoing.

Do I have to take part?

Participation is voluntary and you are free to withdraw at any time without giving any reason. If you do not complete the consent form you will not be videoed.

Are there any risks in taking part?

There are no perceived risks in participating in this study.

Are there any benefits in taking part?

There are no personal benefits in participating in the investigation. However, the data from the study is intended to assist the future communication skills teaching for medical students at Liverpool.

What if I am unhappy or there is a problem?

If you are unhappy, or if there is a problem, please feel free to let us know by contacting Dr Ian Fletcher or Dr Helen O'Sullivan and we will try to help. Any complaint about the way you have been dealt with during this study will be addressed in the first instance by the University Research Governance Officer.

Will my participation be kept confidential?

Yes. All the videos and the questionnaires will be marked with a random number to ensure anonymity. The videos will be transferred to a password protected database and then destroyed after transfer. All data collected during the study will be securely stored at all times and be kept strictly confidential. This means that only the researchers will view the videos and have access to any data collected. You will not be named or identified in any reports of the study. We may include brief written quotations from videos in future publications, but, we will always change details so that nobody can be identified.

What will happen to the results of the study?

We intend to submit the results of the investigation for publication.

What will happen if I want to stop taking part?

You can withdraw from the investigation at any time without giving an explanation.

Who can I contact if I have further questions?
Gemma Cherry, 0151 795 4332, email: m.g.cherry@liv.ac.uk
Dr Ian Fletcher, 0151 794 5530, email: ian.fletcher@liverpool.ac.uk
Dr Helen O'Sullivan, 0151 795 4356, email: h.m.osullivan@liverpool.ac.uk

3.4 Participant Consent Form (Patients)

UNIVERSITY OF LIVERPOOL

CONSENT FORM - patients

		Please initial box
Title of Research Project:	Foundation doctors' attachment styles, emotional intelligence and communication with patients	
Researcher(s):	Gemma Cherry Ian Fletcher Helen O'Sullivan	

1. I confirm that I have read and have understood the information sheet for the above study. I have had the opportunity to consider the information, ask questions and have had these answered satisfactorily. ☐

2. I understand that my participation is voluntary and that I am free to withdraw at any time without giving any reason, without my rights being affected. ☐

3. I understand that, under the Data Protection Act, I can at any time ask for access to the information I provide and I can also request the destruction of that information if I wish. ☐

4. I agree to take part in the above study. ☐

_____   _____   _____

Participant name   Date   Signature

_____   _____   _____

Name of researcher taking consent   Date   Signature

The contact details of lead Researcher are:
Miss Gemma Cherry, School of Medical Education, 0151 7954332, m.g.cherry@liv.ac.uk
Thank you very much for your time and cooperation

Appendix 5: Additional Information

1   Study 1

1.1   **Email to Students**

Dear 1st year medical student,

Please take the time to read the attached document which gives details of research taking place in a 5-minute station in your forthcoming summative communication skills' OSCE. Further information and materials regarding the study will be posted on VITAL shortly.

Thank you and please feel free to contact us with any queries

Gemma Cherry: gcherry@liv.ac.uk
Dr Ian Fletcher: ian.fletcher@liverpool.ac.uk
Dr Helen O'Sullivan: h.m.osullivan@liv.ac.uk

Note: Information sheet was attached to this email

Simulated Patient Information for the Videoed Station

Name:	Jan/Ian Curtis
Age:	Actors own
Medical Issue:	Hepatitis A
Setting:	General Practice surgery- routine appointment

Biomedical perspective
Three weeks ago you developed flu like symptoms. You had quite a high fever, with an aching body and brief headaches. You also noticed that you had lost your appetite. At times you felt quite nauseous but never vomited. You also had mild diarrhoea. After 4 or 5 days, you started to feel a bit better, but you noticed that there was a yellow tinge to your skin and when you looked in the mirror, your eyes looked very tired. Your partner commented that your eyes looked 'off white'. This made you think that you might have jaundice. During this week, you made sure to keep yourself hydrated by drinking quite a lot of water and cups of teas. Despite, drinking quite a lot of fluid, your urine was much darker than normal. You also noticed that your faeces were a very pale colour. In addition to the general aching in your muscles, there was a specific ache just below your ribs on the upper right hand side of your stomach.

You are no longer experiencing any flu like symptoms and the colour of your urine and faeces appear to be back to normal. However, you have been left with feelings of tiredness and lethargy for two weeks, despite sleeping well. You had a few days off work when you had flu like symptoms, but since then have been back at work, but are finding it much more tiring than normal.

Ideas and thoughts
You are beginning to get concerned that you have picked up a virus or some kind of parasite from your travels in northern Africa 6 weeks ago. Your partner had experienced similar symptoms a couple of weeks before your flu like symptoms began, but his/her symptoms cleared up within 3 or 4 days. When you were on holiday in North Africa, you stayed in some quite remote places, where there was poor sanitation and you are now worrying that you might have a serious disease.

What are you hoping for?
You are hoping that the doctor will be able to reassure you and tell you that there is nothing seriously wrong. You are also hoping for an explanation as to why the symptoms have only started 3 weeks after your travels in North Africa.

Past medical history
You are generally fit and healthy. You had a squamous cell carcinoma removed from your arm 2 years ago, with no further problems.

Medication
You are not on any medication.

Family history

Both of your parents died in their early 60's. Your mother died from lung cancer and was a heavy smoker all of her life. Your father died from a heart attack. You have an older brother, who is married and lives in Australia. As far as you know, he has no physical health problems.

Social and occupational History

You have worked as a sales manager for 7 years and manage a team of 6 people. You are a non-smoker and social drinker (15 units a week). Your partner is taking a music degree and hopes to offer piano lessons at the end of the year.

How to start/present symptoms?

The medical student will probably ask you:

Why did you come to see the doctor today?

You should start by explaining that you have been feeling tired for the last couple of weeks and wonder whether it is due to an illness you picked up when you were travelling in North Africa.

What type of patient am I?

Socially you are an 'average' patient. You are not overly talkative but you are not quiet either. You consider yourself to be quite a pleasant, calm person and you do not tend to get easily irritated with people. However, you will be firm with people when you need to be. You are not inclined to worry about your health but you are concerned about your symptoms and want to feel they have been fully explored - you see this is a sign that you are being listened to and your concerns are being taken seriously.

1.3 **Simulated Patient Information for the Additional Three Stations**

1.3.1 **Carpal Tunnel Syndrome**

Name:	Martin/Jenny Fisher
Age:	Actors own
Medical Issue:	Carpal Tunnel Syndrome
Setting:	General Practice surgery- routine appointment

Biomedical perspective
Over the past two months, you have had an intermittent pain in your left hand and forearm, which has become more painful recently. When it first started, you noticed 'pins and needles' or a mild tingling sensation in your index and middle fingers. This tingling sensation then spread to your thumb and the bottom half of your ring finger. You have never noticed any tingling or pain in your little finger. In addition to these tingling sensations, you noticed that your fingers and sometime the palm of your hand would have a dull ache and sometimes this dull ache would be in your forearm as well, but you have never noticed it going as far as the top of your arm. All of these symptoms tended to come and go and often just moving your hand would alleviate all of the symptoms. Both the aching and the pins and needles occur predominately on the palm side of your hand.

In the last fortnight the symptoms have got worse. The dull ache is there most of the time and is more painful. It has got to the point where the pain in your hand will wake you up during the night. You have found that you can lessen the pain and aching by 'shaking your wrist' or by frequently changing the position of your hand. You are a little concerned because your hand feels weaker and that your hand is less dextrous than it was previously. Your hand is also worse when you have spent a long time typing at work.

Ideas and thoughts
You have wondered if it is just repetitive strain injury or is something more serious. You do not know what it could be, but you find it puzzling that it is only happening in your left hand. Initially, you thought it would just go of its own accord, but it has become more painful and persistent and you are a little concerned that it's a problem that will be with you for some considerable time. A small consolation is that the affected hand is your non-dominant hand.

What are you hoping for?
You are hoping that it is a relatively straightforward problem that can be resolved quickly. Aside from the pain, it is beginning to interfere with your job as you spend a considerable number of hours at the computer and your typing is being adversely affected. You find yourself making noticeably more typing errors and are concerned that if your hand gets worse, it will slow you down considerably at work.

Past medical history

You have been fit and healthy and have only visited the doctor three times in your adult life. As a child, you broke your left arm, falling from a tree house, but as far as you can remember it healed well without complications and has never caused you any pain or discomfort.

Medication

You are not on any medication. You occasionally take pain killers for your hand, if the pain wakes you up during the night.

Family history

Both your parents are alive and well. As far you know, there is no family history of serious medical illnesses.

Social and occupational History

You work in the local university as a history lecturer, which you generally enjoy. Your family life is fine; you don't have any children. You and your spouse spend a lot of time at weekends hill walking and you lead an active social life.

How to start/present symptoms?

The medical student will probably ask you:

Why did you come to see the doctor today?

You should start by explaining that your left hand is quite painful and it seems to be getting worse.

What type of patient am I?

Socially you are an 'average' patient. You are not overly talkative but you are not quiet either. You consider yourself to be quite a pleasant, calm person and you do not tend to get easily irritated with people. However, you will be firm with people when you need to be. You are not inclined to worry about your health but you are concerned about your symptoms and want to feel they have been fully explored - you see this is a sign that you are being listened to and your concerns are being taken seriously.

1.3.2 **Patch Testing**

Name: Paul/Paula King

Age: Actors own

Medical Issue: Allergic Contact Dermatitis

Setting: General Practice surgery- routine appointment

Aim of scenario
The aim is to allow the student to provide you with some basic information about patch testing for allergic contact dermatitis.

What do you know so far?
You have developed dermatitis (red, dry patches of itchy and inflamed skin) over the past 6 months, but have not been able to identify any obvious cause such as new items of jewellery or cosmetics. The dry patches of skin occur mostly on your arms, but there have been patches on your shoulders and stomach. Following discussion with your GP, you have been referred to a dermatologist and it is likely that patch testing will be used to try to work out what is causing the irritation.

How are you feeling about it all?
You don't have any real concerns other that being hopeful that that the dermatologist will be able to identify the cause of the irritation.

How to start?
The medical student will probably say that s/he has been asked to give you some advice on patch testing.

You should begin by expressing that you just want to know more about the nature of patch testing and what to expect.

What type of patient am I?
Socially you are an 'average' patient. You are not overly talkative but you are not quiet either. You consider yourself to be quite a pleasant, calm person and you do not tend to get easily irritated with people. However, you will be firm with people when you need to be. You are not inclined to worry about your health but you are concerned about your symptoms and want to feel they have been fully explored - you see this is a sign that you are being listened to and your concerns are being taken seriously.

1.3.3   **Hypertension**

Name: Richard/Jo Ward

Age: Actors own

Medical Issue: Lifestyle factors and hypertension

Setting: General Practice surgery- routine appointment

Aim of scenario
The aim is to allow the student to provide you with some basic life style measures that can help to reduce high blood pressure.

What do you know so far?
You know that you have a family history of cardiovascular disease. Both maternal grandparents died because of heart attacks and your father has been on medication for high blood pressure for a number of years. You have recently been told that you have mildly high blood pressure and that your blood pressure will be monitored over the next 6 months. You also know that if your blood pressure does not drop following changes to your life style, then it is probable you will be prescribed medication.

Your current lifestyle
You stopped smoking 18 months ago, but realise that you probably drink too much (30 – 40 units per week), often eat unhealthy ready meals and do not do any regular exercise.

How are you feeling about it all?
You are a little concerned about finding out you have 'mildly' high blood pressure given your family history. However, your primary concern is that you would like to be able to reduce your blood pressure if possible, without having to take medication.

How to start?
The medical student will probably say that s/he has been asked to give you some advice on how you might be able to reduce your blood pressure.

You should begin by expressing that you are keen to find out what lifestyle changes you can make to reduce your blood pressure.

What type of patient am I?
Socially you are an 'average' patient. You are not overly talkative but you are not quiet either. You consider yourself to be quite a pleasant, calm person and you do not tend to get easily irritated with people. However, you will be firm with people when you need to be. You are not inclined to worry about your health but you are concerned about your symptoms and want to feel they have been fully explored - you see this is a sign that you are being listened to and your concerns are being taken seriously.

2 Study 2

2.1 Email to Students

Dear 2nd year medical student,

Please take the time to read the attached document which gives details of research taking place in a 10 minute station in your forthcoming summative OSCE. Further information and materials regarding the study will be posted on VITAL shortly.

Thank you and please feel free to contact us with any queries

Gemma Cherry: gcherry@liv.ac.uk
Dr Ian Fletcher: ian.fletcher@liverpool.ac.uk
Dr Helen O'Sullivan: h.m.osullivan@liv.ac.uk

Note: Information sheet was attached to this email

2.2 Simulated Patient Information for the Videoed Station

Name: Judith/John Peters

Date of birth: 01/01/1960

Medical Issue: Lower gastro-intestinal bleed

Setting: Hospital ward following overnight admission

Aims
- To take a history of the presenting complaint prior to admission
- To demonstrate sensitivity and a non-judgemental manner
- To acknowledge the patient's concerns
- To take a history which provides an assessment of the symptoms

Opening statement:
"*I passed some black motions and my friend called an ambulance. People have been asking me questions all night. Do I have to go through all this again?*"

History of presenting complaint:

Black stool
- You began to have some loose stools two days ago and initially this was a bit darker than normal colour (very dark brown), but you didn't think much of it, as it was only once per day.
- However in the early hours of last night, you woke at about 3 am with a hot sweat and passed some 'strange' stools. It was really black and tarry and had an unusual smell to it (almost sweet?).
- If asked the quantify the amount – it's very hard to say, as it was in the toilet bowl. (Try not to allude to a large quantity, as the volume needs to be fairly small). There was no red blood from the back passage (but the doctors have since told you that this black poo probably represented digested blood from the stomach).
- Your friend called an ambulance which took you to casualty. After they assessed you (told your history to about 5 different doctors, examined you, took blood tests, put a drip in), you were admitted to this ward. Since being on here, the same thing has happened really – more questions, more examinations, more blood tests.
- You still have a saline drip and have had the black stools twice more but not very much and not as much as the first time. You are currently not allowed to eat anything. You have been allowed a few sips of water but nothing else.

Pain
- You have suffered with stomach pains on and off for the last 6 months.
- This usually occurs 15 – 30 minutes after eating and takes an hour or so to resolve. However, you've had this pain now since you started with the loose stools. It's the same pain as normal, but has obviously lasted much longer than it normally does.

- It's at the top of your stomach, just lower than your breast bone/ribs in the midline.
- It is a deep ache. You don't get any heartburn / burning etc.
- The pain doesn't go anywhere else.
- You would rate the pain as 4-5/10 when it comes normally, but it's probably 6 at the moment.
- You have also had a sensation of fullness/bloating after meals for the last 6 months.
- You saw the GP about a month ago about this pain and she ordered some tests (you are not 100% sure what the tests were – possibly a camera into your stomach - and you are still waiting).

Other
- You haven't vomited or vomited any blood.
- You don't have any problems swallowing and food goes down ok (when you are allowed to eat!)
- You are passing urine ok.
- You haven't lost any weight recently.

Other history:

Past medical:
You have no other significant medical history.

Medication:
You have been taking gaviscon tablets 1 – 2 before meals or 10ml doses of liquid indigestion over the counter preparations every day for the past 6 months and have used these occasionally prior to this. The GP said they would prescribe something stronger when the tests were done at the hospital but you are not clear what tests you were waiting for.

Social/diet
- You live alone in a flat with your dog.
- You have a friend who stays with you occasionally.
- You are a bus driver.
- You have an active social life, going out two or three times in the week. You drink on occasion and have maybe 2 pints (beer or cider) in an average week.
- You used to smoke 20 a day; you stopped 5 years ago.
- You enjoy your work but you work around the city centre and this can become quite stressful.
- You used to enjoy cooking and like traditional healthy meals, meat and two veg, pie and chips, pasta and garlic bread and love your puddings. As the pain comes after food, it has made you enjoy food much less than normal, although you are still eating.

Family history:
Your parents are both dead, you are not aware of any particular problems. Your father had a heart attack aged 67 and your mother died in her sleep aged 72.
You have no siblings

Systems review:
No other symptoms

Ideas, concerns and expectations:
You want the student to read your notes rather than ask you questions again. You want an idea what is happening to you. You are waiting for a diagnosis. You hate being incapacitated and you don't like hospitals. You are very worried about this stool and that the doctor says it was blood and the pain is frustrating you. You thought you were having a camera test? You are expecting someone to give you a diagnosis and tell you how you will be treated. You were not expecting to have someone else come and ask the questions you feel you have already answered more than once. You will answer the questions if the student acknowledges your frustration.
Note: you understand that this student can't give you the diagnosis/camera test/treatment plan etc.

Character/behaviour:
You are feeling very worried and very tired. You are also getting frustrated at being asked the same questions by different people. (4-5/10 'fed-upness')
The student needs to communicate with some empathy and ensure you feel that they are hearing what you say in order for you to calm down and respond to the questions. If the student does not communicate empathy or seem to be acknowledging your frustrations you will give minimal or evasive responses to their questions for example, the student asks when the vomiting started, if you feel they have acknowledged your concerns and frustrations you may say, "*3am I was fast asleep and woke in a sweat*" or similar, if you do not feel that your frustrations have been acknowledged you may respond with, "*in the early hours*" or similar.
All students should be given consent for the interview (if asked).
If the candidate demonstrates some empathy to your frustrations and ensures you know you do have a choice about whether to answer their questions or not, then this will dissipate your frustration and you will be helpful with the history.
If they don't, then the 4-5/10 will continue and you will prompt them x 2 further times ("*I've already said this before....*").
If they still fail to empathise, there is no need to bring up the prompts again but the 4-5/10 will continue and you will be less inclined to give full answers.

2.3 Simulated Patient Information for the Additional Two Stations

2.3.1 Dexa Bone Scan Result

Name: Rebecca Peters

Date of birth: 08/06/1963

Medical Issue: Dexa bone scan result (hysterectomy)

Setting: General Practice surgery- routine appointment

Aims
- To identify and address the patients issue / concern
- To demonstrate sensitivity and a non-judgemental manner
- To provide information with clarity and acknowledge the patients concerns

Opening statement:
"I really don't want to waste your time, I know you are busy but I am concerned about the results of my bone scan. They told me over the phone that it showed osteopenia and I don't know what that means or what is going to happen to me."

History of presenting complaint:
- You had a hysterectomy at 41 years of age following long running problems with your periods. Heavy bleeding and fibroids. You think they left your ovaries in (if asked) but you aren't sure.
- Following surgery you recovered well and continue to feel well.
- You weren't prescribed hormone replacement therapy after the hysterectomy and have never taken it.
- You don't have any hot flushes.
- You are happy with the outcome of the surgery
- You have not had any broken bones or fractures
- It is 7 years since your operation and you have started to think about the consequences of this on your future health
- You saw your GP and they ordered a DEXA bone scan
- You are here for information about the results of your bone scan

Other history:

Past medical
You have no other significant medical history and the Hysterectomy was your only operation.

Medication
You take no prescribed medication. Over the counter- you occasionally take Ibuprofen if you get a headache

Social/diet

- You own a coffee bar and bookshop and you really enjoy your job
- You live with your partner
- You have a 22 year old son
- You have a 9 year old step daughter
- You are very content with your life
- You are very active, enjoying swimming particularly
- You would like to lose a little weight but this is not a big concern
- Your partner enjoys cooking and prepares healthy meals, you are both vegetarian
- You firmly believe in being pro-active about your help and want to reduce risks wherever possible

Family history
There is no significant medical history. Both of your parents are alive and active and both are approaching 70. You have two brothers both in good health

Systems review
Feeling well. You smoke 10 cigarettes daily and have done for about 20 years but you rarely drink alcohol.

Ideas, concerns and expectations
You want to know if there is anything to be concerned about in the scan results. You've read about osteoporosis and know that is thinning of the bones, but you've never heard of this osteopenia. You are an articulate, well informed individual and have some underlying concerns about the impact the early hysterectomy may have had on your long term health.

Character/behaviour
You are friendly, expressing yourself assertively. You want a clear response. You will not be comfortable if the student seems to lack confidence. This will leave you unsure and may make you more aggressive than assertive. You want to know about osteopenia and about what you can do about it.
You are willing to listen if the student demonstrates that they are listening and taking all your concerns seriously – to you this would mean describing the outcome of the scan and any risk factors, positive behaviours confidently.

2.3.2 Lifestyle Advice: Fall Resulting in Wrist Injury

Name: Karen/Keith Adams

Date of birth: 13/06/1970

Medical Issue: Wrist injury

Setting: General Practice surgery- routine appointment

Aims:
- To identify and address the patient's issue/concern
- To explore the patient's lifestyle so as to be able to give appropriate advice
- To give appropriate and understandable information to the patient
- To deal in a sensitive and non-judgmental manner with the patient's alcohol consumption

Opening statement:
"I've come because I hurt my wrist when I fell the other night, I was a bit unsteady on my feet"

History of presenting complaint:
The following points are a summary of what has been going on before you made this appointment and should be offered to students who ask open questions or use reflective statements. If students ask very specific "closed" questions, please just give them the appropriate answers.

- You slipped at home and hurt your wrist when attempting to break your fall.
- You have no history of falls.
- This happened after a night out. You had been out with friends to the pub to see a band and had 3 glasses of wine in the pub.
- You were alone but some friends called in on their way home and took you to hospital.
- You are wearing a 'tubi-grip' you purchased yourself.
- You have had an x-ray and there is no fracture; it's just bruised.
- You deflect questions about your wrist, it's fine, it feels better already.
- It has not affected your work but you were unable to drive for a couple of days and needed a lift.
- You had 2 glasses of wine before leaving home.
- You had 1 more glass of wine and 2 brandy coffees when you got home.
- In total you can remember 6 glasses of wine and 2 brandy coffees.
- This was a weekday evening.
- This happened 3 days ago.
- Your wrist was swollen initially and you used ice to reduce the swelling.
- You have taken over the counter Ibuprofen and this helped.
- You probably get drunk once a week but you can drink 'quite a lot' without feeling drunk, two bottles of wine shared with a friend and you feel fine.

- You would have to drink two bottles of wine alone to feel a little drunk, years ago it would have been a couple of glasses.
- When you really want to relax, sometimes you cannot remember everything that happened the night before and can lose the weekend to your hangover.
- One or two close friends have mentioned you are drinking more than them and you feel a little uncomfortable about this, you know it's increased.
- Another friend said they could not remember seeing you sober and you said that was because they always met in the pub.
- You have two sons who are aged 20 and 23 – one lives with their father / mother and the other with his girlfriend.
- You never drink first thing, at weekends- always after 11am.

Please give students the following information only if they ask you about it:

Other history:

Past medical
You have no significant medical or surgical history.

Medication
You don't take any regular medication. You have no allergies.

Social/diet
You work in a call centre selling mobile phones. You live on your own. You don't smoke and have never smoked. You meet friends in the pub or for dinner usually twice a week and will often drink several glasses of wine with them and a couple of glasses before leaving home. All in all you do drink 3 – 6 glasses of wine on two - four evenings per week and a little more at weekends (Saturday night you drink 2 bottles of wine). However you don't experience any problems (such as the 'shakes') on "drink-free" days. You would describe your diet as average, you recently moved house and live alone so it is difficult to motivate yourself to cook meals but you do try and have only two take-away meals each week. You don't go out of your way to do any exercise, though you do like going for walks at weekends. You have lost a little weight recently

Family history
Both of your parents are fit and well. You have two brothers both in good health.

Systems review
You are feeling fine, no particular new symptoms or changes.

Ideas, concerns and expectations
This wrist injury has made you think about the amount you have been drinking, this has crept up steadily since your divorce. This was 12 months ago. It was difficult as you ran a business together, a newsagents and your ex husband / wife is still running the shop. You had to start from scratch and have felt resentful that they are left with everything you built together. You have been feeling low and thought having a chat with the doctor might help since you don't know enough about units and safe drinking levels and could do without developing another problem.

Character/behaviour

If the student does not pick up on your cue about being unsteady and relate this to alcohol consumption you will say "*I have been overdoing it*" as another cue during the session. You are feeling a little embarrassed but you are keen on some concrete advice and information, which you can apply in your everyday life. What you are not conscious of is that your alcohol intake is well over the recommended limits and that this will contribute to your risk of liver disease. If the students tell you this, you should be taken aback at first and a little embarrassed about it. However, if the students give you the facts in a non-judgmental manner you will be prepared to listen to them. If the student is judgemental then the patient would become more defensive. If they give you a lecture, then you would get bored and 'switch off'.

3 Study 3

3.1 Surgery Invitation Letter

UNIVERSITY OF LIVERPOOL

Dear Dr Jones

Re: Foundation doctors' attachment styles, emotional intelligence and communication skills

The University of Liverpool (School of Medical Education) and the Mersey Deanery are offering an opportunity to collaborate in an investigation. You have been chosen as you host Foundation Year 2 doctors during their placements in 2010-2011. The study will investigate whether there are relationships between doctors' communication skills and their emotional intelligence and attachment styles.

We require your support to access and video a small number of doctor-patient consultations (not examinations) for each consenting F2 doctor. This will take the form of either one morning or one afternoon during the doctor's placement. We would like to emphasise that the researcher will not be present during video recording, and patients will not be in camera shot. The researcher will provide information, gain F2/patient consent, and will be responsible for the safekeeping of all material. There will be no additional work demands for your administration team.

The investigation is supported by the Mersey Deanery, responsible for Foundation doctors' placements during the investigation. We will also provide documentary evidence of research involvement for appraisal and portfolio purposes, and feedback on the study.

Please contact Gemma Cherry (details provided below) if you are interested in the investigation. If interested, further information and/or informal meetings will be arranged. Thank you for taking the time to read this letter and we hope that you will welcome this opportunity to become involved.

Yours sincerely,
Gemma Cherry
Centre for Excellence in Evidence Based Learning and Teaching (CEEBLT)
School of Medical Education
Faculty of Medicine
Cedar House
Ashton Street
L69 3GE
m.g.cherry@liv.ac.uk; (0151) 795 4332

Gemma Cherry (Researcher, CEEBLT, School of Medical Education, University of Liverpool), Dr Helen O'Sullivan (Director of the CEEBLT, School of Medical Education, University of Liverpool), Dr Ian Fletcher (Lecturer, Division of Clinical Psychology, University of Liverpool)

3.2 **Participant Invitation Letter (Doctors)**

UNIVERSITY OF LIVERPOOL

Dear Dr Smith

Re: Foundation doctors' attachment styles, emotional intelligence and communication skills

The University of Liverpool and the Mersey Deanery are offering you an opportunity to become involved in a project, examining whether your attachment style or emotional intelligence influence your communication skills with patients. Participation is voluntary and would require you being videoed during routine patient-doctor consultations. The camera would be directed at you, the patient would not be in camera shot at any time and would not include physical examinations. We would like to video between 4 and 12 consultations, either on one morning or one afternoon at your convenience. The researcher would set the camera up and would not be in the room at the time and the researcher will be responsible for gaining written, informed consent from the patients prior to your consultation with the patient. **We would like to emphasise that there will be no disruption to your surgery by participating and you will receive feedback for use in your portfolio.**

We would also invite you to complete two questionnaires as part of the research, which will measure your attachment style and your emotional intelligence. The Mersey Deanery and your GP surgery are supporting this study.

If you are interested please read the attached Participant Information Sheet for further details. You will be given a certificate of participation for use in your portfolio.

The results of this study will be fed back into the medical curriculum at the University of Liverpool, to assist in the teaching of communication skills to future doctors. Please contact Gemma Cherry (details below) if you are interested in participating and we hope to hear from you soon.

Thank you for your time

Best wishes

Gemma Cherry
E m.g.cherry@liverpool.ac.uk
T 0151 795 4332

Gemma Cherry (Researcher, CEEBLT, School of Medical Education, University of Liverpool), Dr Helen O'Sullivan (Director of the CEEBLT, School of Medical Education, University of Liverpool), Dr Ian Fletcher (Lecturer, Division of Clinical Psychology, University of Liverpool)

3.3 **Participant Reminder Email (Doctors)**

Dear Dr Smith

Foundation doctors' attachment styles, emotional intelligence and communication skills

I recently emailed you to invite you to participate in a research study, run collaboratively between the University of Liverpool and the Mersey Deanery. Participation is voluntary and would require you being videoed during routine patient-doctor consultations. The camera would be directed at you, the patient would not be in camera shot at any time and would not include physical examinations. I would like to video between 4 and 12 consultations, either on one morning or one afternoon at your convenience. I would set the camera up and would not be in the room at the time and I will be responsible for gaining written, informed consent from the patients prior to your consultation with the patient. **I would like to emphasise that there will be no disruption to your surgery by participating and you will receive feedback for use in your portfolio.**

I would also invite you to complete two questionnaires as part of the research, which will measure your attachment style and emotional intelligence. The head of General Practice at the Mersey Deanery and your GP surgery are supporting this study.

If you are interested please read the attached Participant Information Sheet for further details. **You will be given a certificate of participation for use in your portfolio.**

The results of this study will be fed back into the medical curriculum at the University of Liverpool, to assist in the teaching of communication skills to future doctors. **Please contact me to let me know if you are interested in participating (or do not wish to participate).** I hope to hear from you soon.

Thank you for your time

Best wishes

Gemma Cherry
E m.g.cherry@liverpool.ac.uk
T 0151 795 4332

Gemma Cherry
Researcher, Centre for Excellence in Evidence Based Teaching and Learning, School of Medical Education, University of Liverpool

Dr Helen O'Sullivan
Director of the Centre for Excellence in Evidence Based Teaching and Learning, School of Medical Education, University of Liverpool

Dr Ian Fletcher
Lecturer, Division of Clinical Psychology, University of Liverpool

3.4 Participant Reminder Email (Doctors, Sent to Educational Supervisors)

Dear Dr Jones,

Foundation doctors' attachment styles, emotional intelligence and communication skills

Thank you for kindly agreeing to let your practice be involved in the research. However, in order to continue with the investigation we require consent from Dr Smith for this placement. Documents were recently sent to Dr Smith, but unfortunately he has not replied at this stage. I would greatly appreciate it if you could mention to him that you support/consent to the research and ask him to reply to the email (regardless of whether or not he wishes to participate).

I am also happy to come to the clinic prior to videoing to speak with Dr Smith about the research if he would like further information.

Please do not hesitate to contact me with any queries.

Your support is greatly appreciated.

Regards
Gemma

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Centre for Excellence in Evidence Based Teaching and Learning
School of Medical Education
Faculty of Medicine
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Ashton Street
Liverpool
L69 3GE

m.g.cherry@liv.ac.uk
(0151) 795 4332

3.5   **Certificate of Participation (Doctors)**

UNIVERSITY OF LIVERPOOL

Foundation doctors' attachment styles, emotional intelligence and communication with patients

Dr Smith participated in a research study in March 2011 run by the University of Liverpool's School of Medical Education and the Mersey Deanery. The study looked at Foundation doctors' emotional intelligence and their communication with patients in General Practice.

What was the purpose of the study?

Researchers have identified that communication is an important factor in medical consultations. The study aimed to investigate whether the communication skills of Foundation doctors are influenced by their emotional intelligence or attachment styles. We explored whether these influenced communication by investigating differences on ratings of communication skills. We used a coding scheme that codes speech, and for this reason videoed doctors interacting with their patients, in between 4 and 12 patient consultations.

Why was Dr. Smith chosen to take part?

Dr. Smith was chosen because he is a Foundation doctor. We chose routine consultations with patients as they assess communication skills.

What happened when he took part?

We video recorded routine consultations with patients, within the GP surgery where he was placed. Dr Smith was asked to complete an attachment and an emotional intelligence questionnaire prior to being videoed. Please note **the video camera was only directed at Dr Smith and the patient was not in camera shot at any time during the consultation. No physical examinations were videoed.** If the patient did not consent, then the consultation was not video recorded.

The investigators are:
Miss Gemma Cherry and Dr Helen O'Sullivan, Medical Education
Dr Ian Fletcher, Division of Clinical Psychology.

Gemma Cherry distributed the questionnaires and attended the sessions.

Did Dr Smith have to take part?

Participation was voluntary and he was free to withdraw at any time without giving any reason.

Were there any risks to taking part?

There were no perceived risks in participating in this study.

Were there any benefits to taking part?

Dr Smith received this certificate of participation for use in his portfolio. The data from the study will be fed back into the medical curriculum at the University of Liverpool, and is intended to assist the future communication skills teaching for medical students studying there.

Was his participation kept confidential?

Yes. All the videos are marked with a random number to ensure anonymity. The videos are kept securely stored at all times and all the information collected during this study is kept strictly confidential. Dr Smith will not be named or identified in any reports of the study. We may include brief written quotations from his interviews in future publications, but we will always change details so that nobody can be identified.

What will happen to the results of the study?

We intend to submit the results of the investigation for publication.

Appendix 6: Statistical Tests and Associated Documentation

1 Study 1

1.1 Structural Equation Model Output

1.1.1 Model Fit Summary

Minimum was achieved
Chi-square = .560
Degrees of freedom = 1
Probability level = .451

1.1.1.1 CMIN

Model	NPAR	CMIN	DF	P	CMIN/DF
Default model	9	.560	1	.451	.560
Saturated model	10	.000	0		
Independence model	4	73.037	6	.000	12.173

1.1.1.2 RMR, GFI

Model	RMR	GFI	AGFI	PGFI
Default model	.962	.999	.988	.100
Saturated model	.000	1.000		
Independence model	49.494	.809	.681	.485

1.1.1.3 Baseline Comparisons

Model	NFI Delta1	RFI rho1	IFI Delta2	TLI rho2	CFI
Default model	.995	.968	1.008	1.055	1.000
Saturated model	1.000		1.000		1.000
Independence model	.000	.000	.000	.000	.000

1.1.1.4 Parsimony-Adjusted Measures

Model	PRATIO	PNFI	PCFI
Default model	.167	.166	.167
Saturated model	.000	.000	.000
Independence model	1.000	.000	.000

1.1.1.5 NCP

Model	NCP	LO 90	HI 90
Default model	.000	.000	5.061
Saturated model	.000	.000	.000
Independence model	67.037	43.135	98.390

1.1.1.6 FMIN

Model	FMIN	F0	LO 90	HI 90
Default model	.002	.000	.000	.031
Saturated model	.000	.000	.000	.000
Independence model	.451	.414	.266	.607

1.1.1.7 RMSEA

Model	RMSEA	LO 90	HI 90	PCLOSE
Default model	.000	.000	.177	.609
Independence model	.263	.211	.318	.000

1.1.1.8 AIC

Model	AIC	BCC	BIC	CAIC
Default model	18.390	18.963	46.233	55.233
Saturated model	20.000	20.637	50.938	60.938
Independence model	81.037	81.292	93.412	97.412

1.1.1.9 ECVI

Model	ECVI	LO 90	HI 90	MECVI
Default model	.114	.117	.149	.117
Saturated model	.123	.123	.123	.127
Independence model	.500	.353	.694	.502

1.1.1.10 HOELTER

Model	HOELTER .05	HOELTER .01
Default model	1598	2759
Independence model	28	38

1.1.2 Parameter Estimates

1.1.2.1 Regression Weights

			Estimate	S.E.	C.R.	P	Label
Eiyear1	<---	Year1avoidance	-.711	.226	-3.144	.002	par_3
Year1area2	<---	Eiyear1	1.134	.314	3.612	***	par_1
Year1area1	<---	Eiyear1	1.000				
Year1OSCE	<---	Eiyear1	.098	.049	2.017	.044	par_2
Year1OSCE	<---	Year1avoidance	-.073	.082	-.884	.377	par_4

1.1.2.2 Standardised Regression Weights

			Estimate
Eiyear1	<---	Year1avoidance	-.354
Year1area2	<---	Eiyear1	.778
Year1area1	<---	Eiyear1	.667
Year1OSCE	<---	Eiyear1	.218
Year1OSCE	<---	Year1avoidance	-.075

1.1.2.3 Bootstrapped Standard Error Estimates

Parameter			SE	Mean	Bias	SE-Bias
Eiyear1	<---	Year1avoidance	.003	-.341	.003	.004
Year1area2	<---	Eiyear1	.005	.787	.009	.007
Year1area1	<---	Eiyear1	.004	.678	.011	.006
Year1OSCE	<---	Eiyear1	.003	.206	-.003	.005
Year1OSCE	<---	Year1avoidance	.003	-.077	-.002	.004

1.1.2.4 Bootstrapped Bias-Corrected Regression Weights

Parameter			Estimate	Lower	Upper	P
Eiyear1	<---	Year1avoidance	-.711	-1.152	-.299	.010
Year1area2	<---	Eiyear1	1.134	.694	2.286	.003
Year1area1	<---	Eiyear1	1.000	1.000	1.000	...
Year1OSCE	<---	Eiyear1	.098	.008	.192	.075
Year1OSCE	<---	Year1avoidance	-.073	-.204	.070	.438

2 Study 2

2.1 Structural Equation Model Output

2.1.1 Model Fit Summary

2.1.1.1 Result (Default model)

Minimum was achieved
Chi-square = .714
Degrees of freedom = 1
Probability level = .398

2.1.1.2 CMIN

Model	NPAR	CMIN	DF	P	CMIN/DF
Default model	9	.714	1	.398	.714
Saturated model	10	.000	0		
Independence model	4	98.838	6	.000	16.473

2.1.1.3 RMR, GFI

Model	RMR	GFI	AGFI	PGFI
Default model	1.212	.997	.973	.100
Saturated model	.000	1.000		
Independence model	59.545	.730	.551	.438

2.1.1.4 Baseline Comparisons

Model	NFI Delta1	RFI rho1	IFI Delta2	TLI rho2	CFI
Default model	.993	.957	1.003	1.018	1.000
Saturated model	1.000		1.000		1.000
Independence model	.000	.000	.000	.000	.000

2.1.1.5   Parsimony-Adjusted Measures

Model	PRATIO	PNFI	PCFI
Default model	.167	.165	.167
Saturated model	.000	.000	.000
Independence model	1.000	.000	.000

2.1.1.6   NCP

Model	NCP	LO 90	HI 90
Default model	.000	.000	6.179
Saturated model	.000	.000	.000
Independence model	92.838	64.269	128.846

2.1.1.7   FMIN

Model	FMIN	F0	LO 90	HI 90
Default model	.005	.000	.000	.047
Saturated model	.000	.000	.000	.000
Independence model	.754	.709	.491	.984

2.1.1.8   RMSEA

Model	RMSEA	LO 90	HI 90	PCLOSE
Default model	.000	.000	.217	.471
Independence model	.344	.286	.405	.000

2.1.1.9   AIC

Model	AIC	BCC	BIC	CAIC
Default model	18.714	19.428	44.659	53.659
Saturated model	20.000	20.794	48.828	58.828
Independence model	106.838	107.155	118.369	122.369

2.1.1.10   ECVI

Model	ECVI	LO 90	HI 90	MECVI
Default model	.143	.145	.192	.148
Saturated model	.153	.153	.153	.159
Independence model	.816	.597	1.090	.818

2.1.1.11   HOELTER

Model	HOELTER .05	HOELTER .01
Default model	705	1217
Independence model	17	23

2.1.2 **Parameter Estimates**

2.1.2.1 **Regression Weights**

			Estimate	S.E.	C.R.	P	Label
Eiyear2	<---	Avoidance	-.677	.257	-2.633	.008	par_3
area2	<---	Eiyear2	.879	.192	4.568	***	par_1
area1	<---	Eiyear2	1.000				
TotalPercent	<---	Eiyear2	.149	.047	3.188	.001	par_2
TotalPercent	<---	Avoidance	-.143	.100	-1.436	.151	par_4

2.1.2.2 **Standardized Regression Weights**

			Estimate
Eiyear2	<---	Avoidance	-.264
area2	<---	Eiyear2	.820
area1	<---	Eiyear2	.799
TotalPercent	<---	Eiyear2	.329
TotalPercent	<---	Avoidance	-.124

2.1.2.3 **Bootstrapped Standard Error Estimates**

Parameter			SE	Mean	Bias	SE-Bias
Eiyear2	<---	Avoidance	.011	-.688	-.011	.013
area2	<---	Eiyear2	.024	.896	.017	.012
area1	<---	Eiyear2	.000	1.000	.000	.000
TotalPercent	<---	Eiyear2	.002	.150	.002	.003
TotalPercent	<---	Avoidance	-.010	-.147	-.003	.005

2.1.2.4 **Bootstrapped Bias-Corrected Regression Weights**

Parameter			Estimate	Lower	Upper	P
Eiyear2	<---	Avoidance	-.677	-1.216	-.182	.017
area2	<---	Eiyear2	.879	.559	1.390	.003
area1	<---	Eiyear2	1.000	1.000	1.000	...
TotalPercent	<---	Eiyear2	.149	.055	.238	.005
TotalPercent	<---	Avoidance	-.143	-.296	.053	.212

3 Study 3

3.1 List of Variables

3.1.1 Patient-level

- [ageone]: dummy variable for patient being aged 0-24 years (yes=1, no=0)
- [agetwo]: dummy variable for patient being aged 25-44 years (yes=1, no=0)
- [agethree]: dummy variable for patient being aged 45-64 years (yes=1, no=0)
- [agefour]: dummy variable for patient being aged 65-84 years (yes=1, no=0)
- [agefive]: dummy variable for patient being aged 85 or above (yes=1, no=0)
- [femaleb]: dummy variable for patient being a woman (yes=1, no=0)
- [hlth1]: dummy variable for patient rating health as poor (yes=1, no=0)
- [hlth2]: dummy variable for patient rating health as fair (yes=1, no=0)
- [hlth3]: dummy variable for patient rating health as good (yes=1, no=0)
- [hlth4]: dummy variable for patient rating health as very good (yes=1, no=0)
- [hlth5]: dummy variable for patient rating health as excellent (yes=1, no=0)
- [notseen]: dummy variable for patient having not seen the doctor before (yes=1, no=0)
- [seenoncebef]: dummy variable for patient having seen the doctor once before (yes=1, no=0)
- [seenmtoncebef]: dummy variable for patient having seen the doctor more than once before (yes=1, no=0)
- [psych]: dummy variable for patient presenting with a psychosocial health problem (yes=1, no=0)

3.1.2 Doctor-level

- [drfemale]: dummy variable for doctor being a woman (yes=1, no=0)
- [msceit]: total MSCEIT score
- [attachmentavoidance]: attachment avoidance score
- [attachmentanxiety]: attachment anxiety score
- [psychbymsceit]: MSCEIT interaction variable
- [psychbyavoidance]: attachment avoidance interaction variable
- [psychbyanx]: attachment anxiety interaction variable

3.1.3 Outcome variables

- [provide]: proportion of 'provide space' responses
- [affect]: proportion of 'affect focused' responses
- [ptsat]: dummy variable for patient rating doctor as 'excellent' (yes=1, no=0)
- [totalcues]: total number of cues presented per consultation

3.2 Stata Output for Null Model (Research Question 1)

```
xtpoisson totalcues, normal

Fitting comparison Poisson model:

Iteration 0:   log likelihood = -540.84131
Iteration 1:   log likelihood = -540.84131

Fitting full model:

tau =  0.0      log likelihood = -540.84131
tau =  0.1      log likelihood = -520.66015
tau =  0.2      log likelihood = -518.86121
tau =  0.3      log likelihood = -519.60161

Iteration 0:   log likelihood = -518.62454
Iteration 1:   log likelihood = -518.23819
Iteration 2:   log likelihood = -518.23023
Iteration 3:   log likelihood = -518.23023

Random-effects Poisson regression     Number of obs      =        173
Group variable (i): doctorb           Number of groups   =         26

Random effects u_i ~ Gaussian         Obs per group: min =          4
                                                     avg =        6.7
                                                     max =         11

                                      Wald chi2(0)       =          .
Log likelihood  = -518.23023          Prob > chi2        =          .

-------------------------------------------------------------------
totalcues | Coef.    Std. Err.   z     P>|z|    [95% Conf. Interval]
-------------+-----------------------------------------------------
 cons      | .717227  .1151881  6.23   0.000     .4914626    .9429915
-------------+-----------------------------------------------------
 /lnsig2u  | -1.367705 .3904332 -3.50  0.000     -2.13294    -.60247
-------------+-----------------------------------------------------
 sigma_u   | .504669   .0985198                   .3442215    .7399039
-------------------------------------------------------------------
Likelihood-ratio test of sigma_u=0: chibar2(01) =    45.22
Pr>=chibar2 = 0.000
```

3.3 Stata Output for Final Patient-Level Model (Research Question 1)

```
xtpoisson totalcues  seenmtoncebef psych, normal

Fitting comparison Poisson model:

Iteration 0:   log likelihood = -386.85087
Iteration 1:   log likelihood = -386.83269
Iteration 2:   log likelihood = -386.83269

Fitting full model:

tau =  0.0      log likelihood = -386.83269
tau =  0.1      log likelihood = -361.74472
tau =  0.2      log likelihood = -358.04605
tau =  0.3      log likelihood = -357.98184
tau =  0.4      log likelihood = -358.94322

Iteration 0:   log likelihood =  -358.0566
Iteration 1:   log likelihood = -355.16747
Iteration 2:   log likelihood =  -355.1277
Iteration 3:   log likelihood = -355.12769

Random-effects Poisson regression     Number of obs      =        151
Group variable (i): doctorb           Number of groups   =         26

Random effects u_i ~ Gaussian         Obs per group: min =          3
                                                     avg =        5.8
                                                     max =         10

                                      Wald chi2(2)       =     187.57
Log likelihood  = -355.12769          Prob > chi2        =     0.000

------------------------------------------------------------------------
totalcues |   Coef.   Std. Err.    z     P>|z|    [95% Conf. Interval]
----------+-------------------------------------------------------------
seenmto~f | -1.272399  .2323795  -5.48   0.000   -1.727854   -.8169436
psych     |  1.638889  .1237361  13.25   0.000    1.396371    1.881407
_cons     |  .0805947  .1565577   0.51   0.607   -.2262528    .3874421
----------+-------------------------------------------------------------
/lnsig2u  | -.9801334  .3671135  -2.67   0.008   -1.699663   -.2606042
----------+-------------------------------------------------------------
sigma_u   |  .6125855  .1124442                    .427487    .8778302
------------------------------------------------------------------------
Likelihood-ratio test of sigma_u=0: chibar2(01) =     63.41
Pr>=chibar2 = 0.000
```

3.4 Stata Output for Final Patient-Level and Doctor-Level Model (Research Question 1)

```
xtpoisson totalcues  seenmtoncebef psych  msceit attachmentanxiety
attachmentavoidance, normal

Fitting comparison Poisson model:

Iteration 0:   log likelihood = -377.47842
Iteration 1:   log likelihood = -377.46241
Iteration 2:   log likelihood = -377.46241

Fitting full model:

tau =  0.0     log likelihood = -377.46241
tau =  0.1     log likelihood = -355.29363
tau =  0.2     log likelihood =  -352.1549
tau =  0.3     log likelihood = -352.19907

Iteration 0:   log likelihood = -352.05092
Iteration 1:   log likelihood = -344.84125
Iteration 2:   log likelihood = -344.69308
Iteration 3:   log likelihood = -344.69282
Iteration 4:   log likelihood = -344.69282

Random-effects Poisson regression    Number of obs     =       151
Group variable (i): doctorb          Number of groups  =        26

Random effects u_i ~ Gaussian        Obs per group: min =         3
                                                    avg =       5.8
                                                    max =        10
                                     Wald chi2(5)      =    191.09
Log likelihood  = -344.69282         Prob > chi2       =    0.0000

------------------------------------------------------------------------
totalcues |   Coef.   Std. Err.     z    P>|z|   [95% Conf. Interval]
-------------+----------------------------------------------------------
seenmto~f | -1.360891  .2389373   -5.70  0.000  -1.829199   -.8925825
psych     |  1.645033  .1249128   13.17  0.000   1.400209    1.889858
msceit    |  -.006189  .0122087   -0.51  0.612  -.0301176    .0177396
attach~y  | -.1071096  .0297536   -3.60  0.000  -.1654255   -.0487936
attach~e  |  .0659606  .0382891    1.72  0.085  -.0090847    .1410059
_cons     |   1.92614  1.586211    1.21  0.225  -1.182777    5.035057
-------------+----------------------------------------------------------
/lnsig2u  | -.5037897  .4047134   -1.24  0.213   -1.297013    .289434
-------------+----------------------------------------------------------
sigma_u   |  .7773265 .1572972                   .5228259    1.155712
------------------------------------------------------------------------
Likelihood-ratio test of sigma_u=0: chibar2(01) =    65.54
Pr>=chibar2 = 0.000
```

3.5 Stata Output for Final Patient-Level and Doctor-Level Model with Interaction Terms (Research Question 1)

```
xtpoisson totalcues  seenmtoncebef psych  msceit attachmentanxiety
attachmentavoidance  psychbymsceit psychbyavoidance psychbyanx,
normal

Fitting comparison Poisson model:

Iteration 0:   log likelihood = -351.43894
Iteration 1:   log likelihood =  -347.9616
Iteration 2:   log likelihood = -347.95578
Iteration 3:   log likelihood = -347.95578

Fitting full model:

tau =  0.0     log likelihood = -347.95578
tau =  0.1     log likelihood = -328.47072
tau =  0.2     log likelihood = -326.04261
tau =  0.3     log likelihood =  -327.0195

Iteration 0:   log likelihood = -326.01824
Iteration 1:   log likelihood = -318.17688
Iteration 2:   log likelihood = -318.06465
Iteration 3:   log likelihood = -318.06431
Iteration 4:   log likelihood = -318.06431

Random-effects Poisson regression      Number of obs     =        151
Group variable (i): doctorb            Number of groups  =         26
Random effects u_i ~ Gaussian          Obs per group: min =         3
                                                      avg =        5.8
                                                      max =         10

                                       Wald chi2(8)      =     186.25
Log likelihood  = -318.06431           Prob > chi2       =     0.0000

------------------------------------------------------------------
totalcues | Coef.   Std. Err.    z    P>|z|    [95% Conf. Interval]
----------+-------------------------------------------------------
seenmto~f |-1.200996 .2382062  -5.04  0.000   -1.667871    -.73412
mental    |-9.047235 1.678529   5.39  0.000  -12.33709   -5.757379
msceit    |-.0470845 .0144314  -3.26  0.001    -.0753695  -.0187994
attach~y  |-.1408156 .0333782  -4.22  0.000    -.2062356  -.0753956
attach~e  |-.0567936 .0461397  -1.23  0.218    -.1472257   .0336385
psychby~t | .0720663 .0130636   5.52  0.000     .0464621   .0976705
psychby~e | .2332005 .0438727   5.32  0.000     .1472117   .3191893
psychby~x | .0418246 .0328306   1.27  0.203    -.0225221   .1061713
_cons     | 7.887867 1.811622   4.35  0.000     4.337153   11.43858
----------+-------------------------------------------------------
 /lnsig2u |-.5805961 .4030201  -1.44  0.150    -1.370501    .2093088
----------+-------------------------------------------------------
 sigma_u  | .7480406  .1507377                   .503964    1.110327
------------------------------------------------------------------
Likelihood-ratio test of sigma_u=0: chibar2(01) =    59.78
Pr>=chibar2 = 0.000
```

3.6 Stata Output for Null Model (Research Question 3)

```
xtreg  affect

Random-effects GLS regression              Number of obs = 93
Group variable (i): doctorb                Number of groups = 26

R-sq:  within  = 0.0000                     Obs per group: min = 2
       between = 0.0000                                    avg = 3.6
       overall = 0.0000                                    max = 7

Random effects u_i ~ Gaussian              Wald chi2(0)= 0.00
corr(u_i, X)= 0 (assumed)                  Prob > chi2 = .

-------------------------------------------------------------------
affect |     Coef.   Std. Err.     z    P>|z|   [95% Conf. Interval]
-------------+-----------------------------------------------------
_cons  | 12.54556   3.497108    3.59   0.000  5.691355    19.39977
-------------+-----------------------------------------------------
   sigma_u |  13.417197
   sigma_e |   21.55059
       rho |  .27934119    (fraction of variance due to u_i)
-------------------------------------------------------------------
```

3.7   Stata Output for Final Patient-Level Model (Research Question 3)

```
xtreg affect agefive hlth3 hlth4 psych

Random-effects GLS regression          Number of obs     =         93
Group variable (i): doctorb            Number of groups  =         26

R-sq:  within  = 0.4023                Obs per group: min =          2
       between = 0.5652                               avg =        3.6
       overall = 0.4798                               max =          7

Random effects u_i ~ Gaussian          Wald chi2(4)      =      58.19
corr(u_i, X)       = 0 (assumed)       Prob > chi2       =     0.0000

------------------------------------------------------------------
affect | Coef.    Std. Err.      z     P>|z|    [95% Conf. Interval]
-------+----------------------------------------------------------
agefive| 100.3591   15.14      6.63    0.000    70.68521   130.0329
hlth3  | 11.27754   5.556241   2.03    0.042    .3875129   22.16758
hlth4  | 13.73242   6.770768   2.03    0.043    .4619625   27.00289
psych  | 23.23819   5.07026    4.58    0.000    13.30066   33.17572
_cons  |-7.729809   5.585967  -1.38    0.166    -18.6781    .218485
-------+----------------------------------------------------------
    sigma_u | 7.4521582
    sigma_e | 18.617517
        rho | .13809557   (fraction of variance due to u_i)
------------------------------------------------------------------
```

3.8 Stata Output for Final Patient-Level and Doctor-Level Model (Research Question 3)

```
xtreg  affect  agefive  hlth3 hlth4 psych attachmentanxiety
attachmentavoidance msceit

Random-effects GLS regression              Number of obs = 93
Group variable (i): doctorb                Number of groups = 26

R-sq:  within  = 0.4926                     Obs per group: min = 2
       between = 0.5596                                    avg = 3.6
       overall = 0.5120                                    max = 7

Random effects u_i ~ Gaussian              Wald chi2(7)      = 67.91
corr(u_i, X) = 0 (assumed)                 Prob > chi2       = 0.0000

------------------------------------------------------------------
affect  |  Coef.   Std. Err.     z    P>|z|    [95% Conf. Interval]
--------+---------------------------------------------------------
agefive |  95.96091  14.84934   6.46  0.000    66.85673   125.065
hlth3   |  8.293796  5.368869   1.54  0.122    -2.228994  18.81659
hlth4   |  11.71725  6.534708   1.79  0.073    -1.090539  24.52504
psych   |  19.6786   5.050062   3.90  0.000     9.780656  29.57654
attach~y|  1.465577  .5397097   2.72  0.007     .4077656  2.523389
attach~e|  .133957   .820463    0.16  0.870    -1.474121  1.742035
msceit  |  .0128246  .2269507   0.06  0.955    -.4319906  .4576398
 _cons  | -33.99128  30.4421   -1.12  0.264    -93.65669  25.67413
--------+---------------------------------------------------------
   sigma_u |  10.04397
   sigma_e |  16.871909
       rho |  .26166063   (fraction of variance due to u_i)
------------------------------------------------------------------
```

3.9 Stata Output for Final Patient-Level and Doctor-Level Model with Interaction Terms (Research Question 3)

```
xtreg  affect  agefive  hlth3 hlth4 psych attachmentanxiety
attachmentavoidance msceit psychbymsceit psychbyavoid psychbyanx

Random-effects GLS regression              Number of obs    = 93
Group variable (i): doctorb                Number of groups = 26

R-sq:  within  = 0.4610                     Obs per group: min = 2
       between = 0.6668                                    avg = 3.6
       overall = 0.5482                                    max = 7

Random effects u_i ~ Gaussian              Wald chi2(10)     = 72.67
corr(u_i, X) = 0 (assumed)                 Prob > chi2       = 0.0000

        ----------------------------------------------------------------
affect |  Coef.    Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+--------------------------------------------------------
agefive|  99.97965  15.02682    6.65   0.000     70.52762    129.4317
hlth3  |  9.436061  5.531115    1.71   0.088    -1.404725    20.27685
hlth4  |  14.27392  6.809308    2.10   0.036     .9279181    27.61991
psych  | -16.61131  51.89619   -0.32   0.749     -118.326    85.10335
attac~y|  .3227562  .7776495    0.42   0.678    -1.201409    1.846921
attac~e| -.0408829  1.015048   -0.04   0.968     -2.03034    1.948574
msceit | -.0803102  .2864523   -0.28   0.779    -.6417463    .4811259
psych~t|  .0657903  .3791432    0.17   0.862    -.6773168    .8088973
psych~d|  .2064766  1.443941    0.14   0.886    -2.623597     3.03655
psych~x|  1.586412  1.017866    1.56   0.119    -.4085696    3.581393
_cons  |-4.810729   38.23377   -0.13   0.900    -79.74754    70.12608
-------------+--------------------------------------------------------
     sigma_u |  5.8212174
     sigma_e |  17.344744
         rho |  .10123653   (fraction of variance due to u_i)
        ----------------------------------------------------------------
```

3.10   Stata Output for Null Model (Research Question 4)

```
xtlogit  ptsat

Fitting comparison model:

Iteration 0:   log likelihood = -104.31619

Fitting full model:

tau =  0.0     log likelihood = -104.31619
tau =  0.1     log likelihood = -103.68546
tau =  0.2     log likelihood = -103.44645
tau =  0.3     log likelihood = -103.54594

Iteration 0:   log likelihood = -103.44645
Iteration 1:   log likelihood = -103.41982
Iteration 2:   log likelihood = -103.41971
Iteration 3:   log likelihood = -103.41971

Random-effects logistic regression   Number of obs     =        154
Group variable (i): doctorb          Number of groups  =         26
Random effects u_i ~ Gaussian        Obs per group: min =          3
                                                    avg =        5.9
                                                    max =         10
Wald chi2(0)       =         .
Log likelihood  = -103.41971         Prob > chi2       =          .

------------------------------------------------------------------
Ptsat   | Coef. Std. Err.     z    P>|z|    [95% Conf. Interval]
------------+-----------------------------------------------------
_cons   | .3439147 .2045812   1.68  0.093   -.0570571    .7448865
------------+-----------------------------------------------------
/lnsig2u |-1.238806 1.006048                -3.210623     .733012
------------+-----------------------------------------------------
 sigma_u | .5382658 .2707606                 .200827    1.442685
    rho  | .0809393 .074838                  .0121108    .3874994
------------------------------------------------------------------
----------
Likelihood-ratio test of rho=0: chibar2(01) =     1.79
Prob >= chibar2 = 0.090
```

3.11   Stata Output for Final Patient-Level and Doctor-Level Model (Research Question 4)

```
xtlogit ptsat  msceit attachmentanxiety attachmentavoidance

Fitting comparison model:

Iteration 0:   log likelihood = -104.31619
Iteration 1:   log likelihood = -100.50149
Iteration 2:   log likelihood = -100.49643
Iteration 3:   log likelihood = -100.49643

Fitting full model:

tau =  0.0     log likelihood = -100.49643
tau =  0.1     log likelihood = -100.49688

Iteration 0:   log likelihood = -100.49688
Iteration 1:   log likelihood = -100.46685
Iteration 2:   log likelihood = -100.46448
Iteration 3:   log likelihood = -100.46445
Iteration 4:   log likelihood = -100.46445

Random-effects logistic regression   Number of obs     =       154
Group variable (i): doctorb           Number of groups  =        26

Random effects u_i ~ Gaussian         Obs per group: min =         3
                                                     avg =       5.9
                                                     max =        10

                                      Wald chi2(3)      =      6.63
Log likelihood  = -100.46445          Prob > chi2       =    0.0845

------------------------------------------------------------------------------
   ptsat |   Coef.   Std. Err.     z    P>|z|   [95% Conf. Interval]
---------+--------------------------------------------------------------------
Msceit  |  .0146131   .013398    1.09   0.275  -.0116465    .0408728
attach~y| -.0350292  .0361554   -0.97   0.333  -.1058925    .035834
attach~e| -.0478345  .0500556   -0.96   0.339  -.1459417    .0502728
  _cons |  .0641299  1.823986    0.04   0.972  -3.510816    3.639076
---------+--------------------------------------------------------------------
/lnsig2u| -2.874775  4.157293                  -11.02292     5.27337
---------+--------------------------------------------------------------------
sigma_u |  .2375476   .4937774                  .0040402    13.96683
    rho |  .0168631   .0689226                  4.96e-06    .9834148
------------------------------------------------------------------------------
Likelihood-ratio test of rho=0: chibar2(01) =     0.06
Prob >= chibar2 = 0.400
```

3.12 Stata Output for Final Patient-Level and Doctor-Level Model with Interaction Terms (Research Question 4)

```
xtlogit ptsat  msceit attachmentanxiety attachmentavoidance
psychbymsceit psychbyavoidance psychbyanx

Fitting comparison model:

Iteration 0:   log likelihood = -104.31619
Iteration 1:   log likelihood = -100.21243
Iteration 2:   log likelihood = -100.20598
Iteration 3:   log likelihood = -100.20598

Fitting full model:

tau =  0.0     log likelihood = -100.20598
tau =  0.1     log likelihood = -100.26824

Iteration 0:   log likelihood = -100.26824
Iteration 1:   log likelihood = -100.20949
Iteration 2:   log likelihood = -100.20122
Iteration 3:   log likelihood = -100.20096
Iteration 4:   log likelihood = -100.20096

Random-effects logistic regression    Number of obs     =       154
Group variable (i): doctorb           Number of groups  =        26
Random effects u_i ~ Gaussian         Obs per group: min =         3
                                                     avg =       5.9
                                                     max =        10

                                      Wald chi2(6)      =      7.33
Log likelihood  = -100.20096          Prob > chi2       =    0.2914

------------------------------------------------------------------------
   ptsat |   Coef.    Std. Err.      z     P>|z|   [95% Conf. Interval]
---------+--------------------------------------------------------------
  msceit |  .0143698  .0137117     1.05   0.295   -.0125046    .0412443
 attach~y| -.0464487  .0419042    -1.11   0.268   -.1285794     .035682
 attach~e| -.0464119  .055032     -0.84   0.399   -.1542725    .0614488
  psych~t | -.0025009  .0116487    -0.21   0.830   -.025332    .0203303
  psych~e |  -.022764  .0864195    -0.26   0.792   -.1921431    .1466151
  psych~x |  .0376359  .076193      0.49   0.621   -.1116997    .1869714
    _cons |   .231423 1.795007      0.13   0.897   -3.286726    3.749572
---------+--------------------------------------------------------------
/lnsig2u| -3.388745 5.321287                       -13.81828    7.040786
---------+--------------------------------------------------------------
 sigma_u |  .1837145  .4887987                       .0009986    33.79772
     rho |  .0101549  .0534884                       3.03e-07    .9971282
------------------------------------------------------------------------
Likelihood-ratio test of rho=0: chibar2(01) =     0.01
Prob >= chibar2 = 0.460
```

4 Information Relating to the Verona Coding Definition of Emotional Sequences

4.1 Definition of Cues: Reproduced from Del Piccolo et al., 2009

Definition	Description	Type of emotional expression
Cue A	Words or phrases in which the patient uses vague or unspecified words to describe his/her emotions	Emotional expression is vague and unspecific with reference to patient's own feeling
Cue B	Verbal hints to hidden concerns (emphasizing, unusual words, unusual description of symptoms, profanities, exclamations, metaphors, ambiguous words, double negatives, expressions of uncertainties and hope)	Emotional expression hints to an implicit emotional using metaphors
Cue C	Words or phrases which emphasise (verbally or non-verbally) physiological or cognitive correlates (regarding sleep, appetite, physical energy, excitement or motor slowing down, sexual desire, concentration) of unpleasant emotional states. Physiological correlates may be described by words such as weak, dizzy, tense, restless, low or by reports of crying whereas cognitive correlates may be described by words such poor concentration or poor memory	Emotional expression indicates physiological correlate of emotion

Definition	Description	Type of emotional expression
Cue D	Neutral expressions that mention issues of potential emotional importance which stand out from the narrative background and refer to stressful life events and conditions.	Verbal content is neutral and has not been mentioned before. Context of expression is important rather than wording
Cue E	A patient elicited repetition of a previous neutral expression (repetitions, reverberations or echoes of neutral expression within a same turn are not included)	Emotion is suspected due to repetition of neutral expression or sentence in subsequent speech
Cue F	Non verbal cue: - clear expressions of negative or unpleasant emotions (crying), or hint to hidden emotions (sighing, silence after provider question, frowning etc)	Emotion is expressed non-verbally
Cue G	A clear and unambiguous expression of an unpleasant emotion which is in the past (more than one month ago)	Emotion is explicit but referred to in past tense and occurred more than one month ago
Concern	A clear and unambiguous expression of an unpleasant current or recent emotion where the emotion is explicitly verbalised with a stated issue of importance for the patient	Emotion is clearly verbalised. Emotion can be a response to healthcare provider question