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Die Veränderung von dysfunktionalen Erwartungen bei Menschen mit depressiven Störungen und Symptomen – Kognitive, affektive und verhaltensbezogene Mechanismen

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Zusammenfassung

Im Rahmen dieses Dissertationsvorhabens wurde mittels fünf wissenschaftlicher Artikel untersucht, welche Mechanismen die Erwartungsveränderung bei Menschen mit depressiven Störungen und Symptomen begünstigen beziehungsweise hemmen.

Es wurde ein experimentelles Paradigma entwickelt, in welchem positive Erfahrungsberichte über Psychotherapie genutzt wurden, um die Erwartungen bezüglich positiver versus negativer Lebensereignisse und die Behandlungserwartungen zu modifizieren. Es wurde an einer kleinen klinischen Stichprobe (N = 17) auf Machbarkeit überprüft (Artikel 1) und an einer großen klinischen Stichprobe (N = 156) angewendet. Die Erfahrungsberichte verbesserten die Erwartungen signifikant. Der Einfluss von kognitiver Immunisierung auf die Erwartungsveränderung konnte nicht nachgewiesen werden (Artikel 2). Menschen mit persistierender depressiver Störung (n = 54) verbesserten ihre Therapieerwartungen weniger stark als Menschen mit episodischer depressiver Störung (n = 102), besonders wenn kognitive Immunisierung experimentell gefördert wurde (Artikel 3).

Zudem wurde an einer klinischen Stichprobe (N = 80) der Einfluss von State Affekt auf die Erwartungsveränderung nach positivem versus negativem Leistungsfeedback untersucht. Affekt hatte keinen signifikanten Einfluss auf die Erwartungsveränderung (Artikel 4).

Abschließend wurde an zwei Stichproben (N = 149 und N = 212) untersucht, wie der Schweregrad depressiver Symptome mit der Inkongruenz zwischen Selbst- und erwarteter Fremdwahrnehmung (Metawahrnehmung) und dem Feedbacksuchverhalten zusammenhängt. Mit steigendem Schweregrad wich die Selbstwahrnehmung zunehmend negativ von der Metawahrnehmung ab. Außerdem zeigte sich ein negativer Zusammenhang zwischen dem Schweregrad und dem Feedbacksuchverhalten, der jedoch nicht durch Valenz des Feedbacks oder Inkongruenz zwischen Selbst- und Metawahrnehmung erklärt werden konnte (Artikel 5).

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1. Zusammenfassung und Abstract

1.1 Zusammenfassung

Dysfunktionale Erwartungen stellen ein Kernmerkmal depressiver Störungen dar. Sie sind bedeutsam für den Krankheitsverlauf und den Behandlungserfolg. Entsprechend ist es wichtig, dysfunktionale Erwartungen im Therapiekontext aufzugreifen und zu modifizieren. Dies erweist sich häufig als besonders herausfordernd, da Menschen mit depressiven Symptomen und Störungen die Tendenz aufweisen, dysfunktionale Erwartungen aufrecht zu erhalten, auch dann, wenn diese Erwartungen durch das Eintreten positiver, erwartungsinkongruenter Erlebnisse verletzt werden. Das Ziel des vorliegenden Dissertationsvorhabens war es daher, zu untersuchen, welche Mechanismen die Erwartungsveränderung bei Menschen mit depressiven Störungen und Symptomen begünstigen beziehungsweise hemmen.

Dafür wurde zunächst ein extern valides, experimentelles Paradigma entwickelt, in welchem positive Erfahrungsberichte über Psychotherapie genutzt werden sollten, um 1) die Erwartungen bezüglich positiver versus negativer Lebensereignisse und 2) die Behandlungserwartungen bei Menschen mit depressiver Störung zu modifizieren. Teil des Paradigmas war eine experimentelle Manipulation von kognitiver Immunisierung, deren Einfluss im Vergleich zu anderen kognitiven Mechanismen (Interpretationsbias und eingeschränktes Erinnerungsvermögen) auf die Erwartungsveränderung untersucht werden sollte. Das Paradigma wurde an einer kleinen klinischen Stichprobe (N = 17) auf seine Machbarkeit hin überprüft (Artikel 1).

Das experimentelle Paradigma wurde aufbauend auf den Erkenntnissen aus Artikel 1 leicht modifiziert und an einer großen klinischen Stichprobe (N = 156) von Menschen mit depressiver Störung eingesetzt. Es zeigte sich, dass die Erfahrungsberichte zu einer signifikanten Verbesserung der Erwartungen bezüglich positiver und negativer Lebensereignisse sowie der Therapieerwartungen führten. Anders als angenommen unterschieden sich die experimentellen

Bedingungen in der Veränderung der Erwartungen nicht voneinander, was bedeutet, dass der Einfluss von kognitiver Immunisierung auf die Erwartungsveränderung nicht nachgewiesen werden konnte (Artikel 2).

Mit der Stichprobe aus Artikel 2 wurden in einem dritten Artikel Unterschiede in der Erwartungsveränderung zwischen Menschen mit persistierender depressiver Störung (n = 54) und Menschen mit episodischer depressiver Störung (n = 102) untersucht. Auch hier wurde der Einfluss von kognitiver Immunisierung mitberücksichtigt. Es zeigte sich, dass Menschen mit persistierender depressiver Störung im Vergleich zu Menschen mit episodischer depressiver Störung insgesamt niedrigere Ausgangserwartungen hatten. Weiterhin verbesserten sich ihre Therapieerwartungen weniger stark. Die Unterschiede zwischen Menschen mit persistierender und Menschen mit episodischer depressiver Störung waren besonders stark ausgeprägt, wenn kognitive Immunisierung experimentell gefördert wurde (Artikel 3).

Weiterhin wurde an einer klinischen Stichprobe von N = 80 der Einfluss von traurigem versus heiterem Affekt und Affektregulation auf die Erwartungsveränderung nach positivem versus negativem Leistungsfeedback untersucht. Insgesamt zeigte sich, dass die Erwartungsveränderung in Reaktion auf negatives Feedback stärker ausfiel als in Reaktion auf positives Feedback. Affekt hatte keinen signifikanten Einfluss auf die Erwartungsveränderung. Explorative Analysen wiesen darauf hin, dass es bei den Teilnehmenden, bei denen Traurigkeit induziert wurde, Zusammenhänge zwischen den Ausgangserwartungen und der Erwartungsveränderung sowie der Affektregulation und der Erwartungsveränderung gab (Artikel 4).

Abschließend wurde untersucht, wie der Schweregrad depressiver Symptome mit dem Feedbacksuchverhalten von positivem versus negativem Feedback zusammenhängt. Dafür wurde an einer Stichprobe von N = 149 zunächst untersucht, ob es einen Zusammenhang zwischen dem Schweregrad depressiver Symptome und der Inkongruenz zwischen Selbst- und erwarteter Fremdwahrnehmung (Metawahrnehmung) gibt. Aufbauend auf den Ergebnissen dieser

Studie wurde eine zweite Studie durchgeführt, in der an einer Stichprobe von $N = 212$ untersucht wurde, ob es einen Zusammenhang zwischen dem Schweregrad depressiver Symptome und Feedbacksuchverhalten gibt und ob dieser Zusammenhang durch die Inkongruenz zwischen Selbst- und Metawahrnehmung und Valenz des Feedbacks erklärt werden kann. In beiden Studien zeigte sich ein Zusammenhang zwischen dem Schweregrad depressiver Symptome und der Inkongruenz zwischen Selbst- und Metawahrnehmung: mit steigendem Schweregrad depressiver Symptome wich die Selbstwahrnehmung zunehmend negativ von der Metawahrnehmung ab. Es zeigte sich in der zweiten Studie außerdem ein negativer Zusammenhang zwischen dem Schweregrad depressiver Symptome und dem Feedbacksuchverhalten. Dieser konnte jedoch nicht durch Valenz oder Inkongruenz zwischen Selbst- und Metawahrnehmung erklärt werden (Artikel 5).

1.2 Abstract

Dysfunctional expectations constitute a core feature of depressive disorders. They are significant for the course of the disorder and treatment success. Accordingly, it is important to address and modify dysfunctional expectations within the therapeutic context. This often proves to be particularly challenging, as people with depressive symptoms and disorders tend to maintain dysfunctional expectations, even when these expectations are violated by positive, expectation-inconsistent experiences. Therefore, the aim of this dissertation was to investigate which mechanisms promote or inhibit expectation change in individuals with depressive disorders and symptoms.

For this purpose, an externally valid experimental paradigm was developed, in which positive testimonials about psychotherapy were used to modify 1) expectations regarding positive versus negative life events and 2) treatment expectations in individuals with a depressive disorder. Part of the paradigm was an experimental manipulation of cognitive immunization, the influence of which on expectation change was to be investigated in comparison to other

cognitive mechanisms (interpretation bias and impaired memory recall). The feasibility of the paradigm was tested on a small clinical sample of $N = 17$ (paper 1).

Based on the findings of paper 1, the experimental paradigm was slightly modified and applied to a large clinical sample ($N = 156$) of individuals with a depressive disorder. The results showed that the experience reports led to a significant improvement in expectations regarding positive and negative life events as well as therapy expectations. Contrary to expectations, the experimental conditions did not differ from one another in terms of the change in expectations, meaning that the influence of cognitive immunization on expectation change could not be demonstrated (paper 2).

Using the sample from paper 2, a third paper examined differences in expectation change between individuals with persistent depressive disorder ($n = 54$) and individuals with episodic depressive disorder ($n = 102$). The influence of cognitive immunization was also taken into account here. The results revealed, that individuals with persistent depressive disorder had overall lower baseline expectations compared to individuals with episodic depressive disorder. Furthermore, their therapy expectations improved to a lesser extent. The differences between individuals with persistent and episodic depressive disorder were particularly pronounced when cognitive immunization was experimentally promoted (paper 3).

Furthermore, a clinical sample of $N = 80$ was used to examine the influence of sadness versus joviality and affect regulation on expectation change following positive versus negative performance feedback. Overall, it was found that expectation change in response to negative feedback was stronger than in response to positive feedback. Affect had no significant influence on expectation change. Exploratory analyses indicated that among participants who were induced to feel sadness, initial expectations and expectation change as well as affect regulation and expectation change were correlated (paper 4).

Finally, the relationship between depressive symptom severity and feedback seeking for positive versus negative feedback was examined. For this purpose, a sample of $N = 149$ was examined to determine whether there is a correlation between depressive symptom severity and the incongruence between self- and expected other-perception (meta-perception). Building on the results of this study, a second study was conducted with a sample of $N = 212$ to examine whether there is a correlation between depressive symptom severity and feedback seeking and whether this correlation can be explained by the incongruence between self- and meta-perception and the valence of the feedback. Both studies revealed a correlation between depressive symptom severity and the incongruence between self- and meta-perception: with increasing depressive symptom severity, self-perception deviated increasingly negative from meta-perception. The second study also showed a negative correlation between depressive symptom severity and feedback seeking. However, this could not be explained by valence or incongruence between self- and meta-perception (paper 5).

2. Theoretischer Hintergrund

2.1 Depressive Störungen

2.1.1 Klinisches Erscheinungsbild

Depressive Störungen gehören gemäß der Klassifikationssysteme „Diagnostic and Statistical Manual“ (DSM) und „International Statistical Classification of Diseases and Related Health Problems“ (ICD) zu den affektiven Störungen (American Psychiatric Association, 2013; World Health Organization, 2016). Die Symptome depressiver Störungen sind vielseitig und umfassen affektive (z.B. Gefühle von Niedergeschlagenheit), kognitive (z.B. Konzentrationsstörungen), physiologisch-vegetative (z.B. Schlafstörungen), motorische (z.B. motorische Verlangsamung) und verhaltensbezogene Symptome (z.B. suizidale Handlungen; American Psychiatric Association, 2013; World Health Organization, 2016).

Das häufigste Erscheinungsbild depressiver Störungen stellt die Major Depression dar (American Psychiatric Association, 2013). Die Major Depression ist charakterisiert durch voneinander abgrenzbare depressive Episoden, welche jeweils mindestens zwei Wochen anhalten. Tritt eine solche Episode bei einer betroffenen Person nur einmal im Leben auf, lässt sich dies als Major depressive Episode klassifizieren. Treten im Laufe des Lebens mindestens zwei Major depressive Episoden auf, spricht man von einer rezidivierenden depressiven Störung (American Psychiatric Association, 2013). Symptome einer Major depressiven Episode nach DSM-5 (American Psychiatric Association, 2013) und ICD-10 (World Health Organization, 2016) sind: Anhaltende Traurigkeit beziehungsweise gedrückte Stimmung, Verlust von Freude oder Interesse, Müdigkeit beziehungsweise Energieverlust, gestörter Schlaf, Konzentrationsstörungen beziehungsweise Entscheidungsschwierigkeiten, geringes Selbstvertrauen, schlechter oder gesteigerter Appetit, Suizidgedanken oder -handlungen, motorische Unruhe oder Verlangsamung und Schuldgefühle beziehungsweise Selbstvorwürfe.

Eine weitere häufige Erscheinungsform depressiver Störungen stellt die Dysthymia dar. Die Dysthymia unterscheidet sich in zwei wesentlichen Merkmalen von der Major depressiven Episode: es müssen weniger Symptome vorhanden sein, diese müssen aber persistierend sein. Bei der Dysthymia leiden die Betroffenen über einen Zeitraum von mindestens zwei Jahren an der Mehrzahl der Tage an einer depressiven Stimmung. Zusätzlich sind mindestens zwei der folgenden Kriterien erfüllt: verringerter oder gesteigerter Appetit, Schlafstörungen, Energieverlust, geringes Selbstwertgefühl, Konzentrationsschwierigkeiten und Gefühle der Hoffnungslosigkeit. In diesem Zweijahres-Zeitraum gibt es keinen symptomfreien Zeitraum von über zwei Monaten (World Health Organization, 2016).

Nach DSM-5 (American Psychiatric Association, 2013) wird die Major depressive Störung als eine episodisch verlaufende depressive Störung von der persistierenden depressiven Störung als eine chronisch verlaufende depressive Störung abgegrenzt. Die persistierende depressive Störung umfasst dabei die folgenden Erscheinungsformen: 1) das rein dysthyme Syndrom, wie oben beschrieben, 2) eine persistierende, also eine mindestens zwei Jahre andauernde, Major depressive Episode oder 3) eine rezidivierende depressive Störung, bei welcher die Symptomatik zwischen den einzelnen Episoden über einen Zweijahres-Zeitraum nicht vollständig abklingt, es also keine vollständige Remission zwischen den Rezidiven gibt. Eine Trennung zwischen episodischer und persistierender depressiver Störung lässt sich durch psychopathologische Unterschiede in der Ätiologie und im Krankheitsverlauf rechtfertigen (Klein & Kotov, 2016). Beispielsweise gehen persistierende depressive Störungen häufiger mit Missbrauchserfahrungen in der Kindheit einher (Brakemeier et al., 2018; Brown et al., 2013), sind mit einem niedrigeren sozialen und beruflichen Funktionsniveau assoziiert (Evans et al., 1996) und hängen mit schlechteren Krankheitsverläufen und Therapieergebnissen sowie einem erhöhtem Suizidrisiko zusammen (Klein et al., 2000).

2.1.2 Epidemiologie

Depressive Störungen gehören zu den weltweit am häufigsten auftretenden psychischen Störungen (Alonso et al., 2004). Über verschiedene Kulturen hinweg beträgt die 12-Monats-Prävelenz für eine Major depressive Episode 3.2% bei Menschen ohne körperliche Erkrankungen und 9.3% bis 23% bei Menschen mit körperlicher Erkrankung (Moussavi et al., 2007). Die kulturübergreifende Lebenszeit-Prävalenz reicht von 1.5% (Taiwan) bis zu 19% (Beirut; Weissman et al., 1996), in Deutschland beträgt die 12-Monats-Prävalenz 6% (Jacobi et al., 2014, 2016). Die Major Depression weist in der Regel einen episodischen Krankheitsverlauf auf. Bei etwa einem Drittel tritt im Laufe des Lebens eine isolierte depressive Episode auf, bei etwa einem Drittel kommt es im Laufe des Lebens zu wiederkehrenden depressiven Episoden und etwa ein Drittel weist einen chronischen Krankheitsverlauf ohne vollständige Remission zwischen den depressiven Episoden auf (Paykel et al., 2005).

Die individuellen Kosten depressiver Störungen sind vielfältig, bestimmen den weiteren Verlauf der Erkrankung und können sehr einschneidend sein. Depressive Störungen stellen gemeinsam mit Rücken- und Kopfschmerzen die Hauspursache für die „durch Behinderung beeinträchtigten Lebensjahre“ dar (GBD 2017 Disease and Injury Incidence and Prevalence Collaborators, 2018). In reichen Industrienationen weisen Kinder und Jugendliche, die von einer Major Depression betroffen sind, ein um 60% erhöhtes Risiko auf, die weiterführende Schule nicht erfolgreich abzuschließen (Kessler & Bromet, 2013). Depressive Erkrankungen können die Arbeitsfähigkeit und die psychosozialen Fähigkeiten der Betroffenen stark einschränken (Cambridge et al., 2018). Menschen mit depressiven Störungen haben im Vergleich zur Allgemeinbevölkerung eine etwa zweifach erhöhte Mortalität und eine um 10-14 Jahre reduzierte Lebenserwartung (Chesney et al., 2014; Laursen et al., 2016). Dies lässt sich zum einen dadurch erklären, dass depressive Störungen zu den häufigsten psychischen Ursachen für vollzogene Suizide gehören (Chesney et al., 2014) und zum anderen damit, dass die Betroffenen ein

erhöhtes Risiko für chronische, lebensverkürzende Erkrankungen wie Herz-Kreislauf-Erkrankungen, Diabetes und Adipositas aufweisen (Laursen et al., 2016; Penninx et al., 2013).

Neben diesen individuellen Kosten für die Betroffenen, führen depressive Störungen zu enormen gesellschaftlichen Kosten. In Deutschland gehören sie zu den häufigsten Diagnosen im Zusammenhang mit Arbeitsunfähigkeitstagen (Grobe & Bessel, 2024; Grobe & Steinmann, 2019; Knieps et al., 2019; Storm et al., 2019). Im Jahr 2012 stellten unipolare depressive Störungen darüber hinaus die häufigste Ursache für Erwerbsminderungsrenten dar, indem sie ursächlich für 16% aller Frühberentungen waren (Bundespsychotherapeutenkammer, 2013). Laut eines Berichts der Barmer Krankenkasse belaufen sich in Deutschland die durch depressive Störungen verursachten direkten Kosten (z.B. Medikamente, stationäre oder ambulante Behandlung) auf rund 5,2 Milliarden und die indirekten Kosten (z.B. Arbeitslosengeld, Krankengeld) auf 16,8 Milliarden Euro pro Jahr (Wende, 2022).

2.2 Erklärungsmodelle depressiver Störungen

Die Erklärungsmodelle für depressive Störungen sind vielfältig. Zu den bekanntesten und ältesten Modellen gehören die *Verstärker-Verlust-Theorie* (Lewinsohn, 1974), welche einen Mangel an positiven Verstärkern in der Lerngeschichte als ursächlich und aufrechterhaltend für depressive Störungen postuliert, das *Modell der erlernten Hilflosigkeit* (Seligman, 1974), welches depressive Störungen als eine Reaktion auf mangelnde Kontrolle über wichtige Lebensereignisse versteht und das *Modell der dysfunktionalen Kognitionen und Schemata* (Beck, 1970, 1974), nach welchem sich depressive Störungen mit dysfunktionalen kognitiven Schemata bezüglich sich selbst, der Umwelt und der Zukunft erklären lassen. Mittlerweile wird davon ausgegangen, dass depressive Störungen multifaktoriell bedingt sind, was sich in integrativen und biopsychosozialen Erklärungsansätzen widerspiegelt, wie dem *Vulnerabilitäts-Stress-Modell* (Wittchen et al., 2020). Das für die vorliegende Arbeit relevante Konstrukt der dysfunktionalen Erwartungen lässt sich aus dem *Modell der dysfunktionaler Kognitionen und*

Schemata (Beck, 1970, 1974) ableiten, weswegen auf dieses im Folgenden näher eingegangen wird.

2.2.1 Das Modell dysfunktionaler Kognitionen und Schemata (Beck, 1970, 1974)

Das oben genannte *Modell der dysfunktionalen Kognitionen und Schemata* (Beck, 1970, 1974; Abbildung 1) ist das wahrscheinlich bekannteste kognitive Modell depressiver Störungen. Das Modell definiert kognitive Schemata als stabile Denkmuster, welche sich durch Lernerfahrungen entwickeln und in Situationen, die diesen Erfahrungen ähneln, aktiviert werden (z.B. „Ich bin unfähig."). Dysfunktionale Schemata oder Grundannahmen sind in der Regel nicht direkt bewusst zugänglich und rigide gegenüber Veränderungen. Die Aktivierung eines Schemas führt zu automatischen Gedanken (z.B. „Das schaffe ich nicht."), welche der betroffenen Person bewusst sind, ihr in der Regel plausibel erscheinen und somit häufig handlungsleitend sind (z.B. Herausforderungen vermeiden). Dysfunktionale Gedanken zeichnen sich dadurch aus, dass sie absolutistisch, verallgemeinernd, verzerrt und unlogisch sind und sogenannten kognitiven Fehlern unterliegen. Typische kognitive Fehler sind beispielsweise voreilige Schlussfolgerungen (z.B. „Ich muss es gar nicht erst versuchen, es wird eh nicht klappen."), Katastrophisieren (z.B. „Wenn ich dieses Semester nicht alle Prüfungen bestehe, werde ich nie mit dem Studium fertig.") oder Übergeneralisierung (z.B. „Ich bekomme gar nichts auf die Reihe."). Beck (1970, 1974) beschreibt dabei eine *kognitive Triade*, nach welcher sich dysfunktionale Kognitionen auf sich selbst (z.B. „Ich bekomme einfach nichts hin."), auf die Umwelt (z.B. „Meine Kollegen halten mich für einen Versager.") oder auf die Zukunft (z.B. „Aus mir wird nie was.") beziehen können. Das Modell stellt bis heute eine wichtige Basis zum Verständnis und zur Behandlung depressiver Störungen dar. Gleichzeitig wurde es zuletzt dafür kritisiert, dass der Begriff der Kognitionen zu breit und unspezifisch gefasst ist (Rief & Joormann, 2019). Stattdessen benennen Rief und Joormann (2019) Erwartungen, als Subgruppe von

Kognitionen, als besonders relevant für depressive Störungen und deren Behandlung, wie im Folgenden beschrieben.

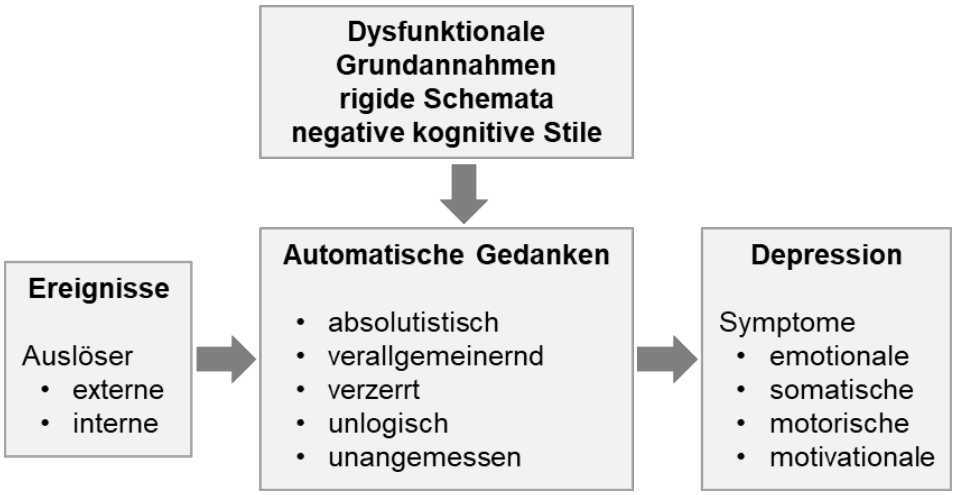


Abbildung 1. Modell der dysfunktionalen Kognitionen und Schemata (nach Hoyer & Knappe, 2020)

2.2.2 Die Rolle von Erwartungen

Erwartungen sind definiert als Kognitionen, welche sich auf das Eintreten eines zukünftigen Ereignisses oder Zustandes beziehen (Schulte, 2008). Bereits in der *kognitiven Triade* des *Modells der dysfunktionalen Kognitionen und Schemata* werden dysfunktionale Erwartungen durch die negative Sicht auf die Zukunft explizit benannt (Beck, 1970, 1974). In den letzten Jahren wurden dysfunktionale Erwartungen immer mehr in den Fokus der Forschung zu depressiven Störungen genommen (Kube, Siebers et al., 2018; Rief & Joormann, 2019; Strunk & Adler, 2009). Dysfunktionale Erwartungen haben einen bedeutsamen Einfluss auf das Verhalten und das emotionale Erleben von Menschen mit depressiven Störungen. Beispielsweise erklären dysfunktionale Erwartungen den Zusammenhang zwischen depressiver Stimmung und dem Aufbau von passivem (z.B. sitzen und nachdenken) bei gleichzeitigem Rückgang von aktivem Verhalten (z.B. soziale Interaktion; Cunningham, 1988). Dysfunktionale Erwartungen erschweren die Antizipation angenehmer Erlebnisse bei Menschen mit depressiven Störungen (MacLeod & Salaminiou, 2001). Menschen mit einer Vulnerabilität für depressive Störungen

zeigen weiterhin geringe Erwartungen bezüglich ihrer Emotionsregulationsfähigkeiten, was wiederum mit dem Vermeiden von (potentiell) emotionsauslösenden Erlebnissen zusammenhängt (Brockmeyer et al., 2012). Dysfunktionale Erwartungen stellen einen Prädiktor für den Verlauf depressiver Störungen dar, so sind Selbstwirksamkeitserwartungen ein negativer Prädiktor für Rezidive (Gopinath et al., 2007) und die Symptomschwere nach einer Behandlung (Gordon et al., 2011; Ludman et al., 2003). Erwartungen spielen bei der Behandlung depressiver Störungen auch deshalb eine wichtige Rolle für den Behandlungsverlauf und das Ergebnis, da Patient*innen, die erwarten, dass ihre Therapie einen positiven Effekt haben wird, sich konstruktiver in die Sitzungen einbringen (Meyer et al., 2002) und eine stärkere Symptomreduktion im Verlauf der Therapie zeigen (Meyer et al., 2002; Meyerhoff & Rohan, 2016).

Aus diesen Befunden lässt sich ableiten, dass eine fokussierte Modifikation dysfunktionaler Erwartungen die Behandlung depressiver Störungen optimieren kann, was sich in einzelnen Ansätzen zur Behandlung depressiver Störungen wiederfindet (Rief & Glombiewski, 2016; Vilhauer et al., 2012; Wilhelm et al., 2022). Die Modifikation dysfunktionaler Erwartungen bei Menschen mit depressiven Störungen stellt jedoch eine besondere Herausforderung dar, da depressive Störungen häufig mit einer Persistenz dysfunktionaler Erwartungen einhergehen. Dies äußert sich darin, dass Betroffene die Tendenz aufweisen, dysfunktionale Erwartungen aufrecht zu erhalten und zwar auch trotz positiver, erwartungsverletzender Erlebnisse, die im Widerspruch zu ihren dysfunktionalen Erwartungen stehen (Everaert et al., 2018; Kube, Rief et al., 2019; Liknaitzky et al., 2017). Aus diesem Grund ist es wichtig, die Mechanismen, welche die Veränderung dysfunktionaler Erwartungen bei depressiven Störungen begünstigen oder hemmen können, besser zu verstehen. Die vorliegende Arbeit versucht sich diesem Ziel anzunähern, indem der Fokus auf die folgenden Mechanismen gelegt wurde: kognitive Immunisierung, State Affekt und Affektregulation und selektives Feedbacksuchverhalten.

2.3 Kognitive Immunisierung

Kognitive Immunisierung ist ein Prozess, bei welchem eine erwartungsverletzende Erfahrung durch kognitive Strategien abgewehrt wird. Nach dem ViolEx-Modell (Abbildung 2) von Rief et al. (2015), welches von Panitz et al. (2021) erweitert wurde, bilden Menschen zum Beispiel auf Grund sozialer oder genetischer Einflüsse generalisierte Erwartungen (z.B. „Mich wird niemals jemand lieben."), welche in entsprechenden Situationen salient werden und sich in situationsspezifischen Erwartungen (z.B. „Heute Abend werde ich nur alleine in der Ecke stehen.") widerspiegeln. Das Modell beschreibt zwei mögliche Reaktionen auf Erwartungsverletzungen: Die Akkommodation, welche zu einer Veränderung der Erwartungen führt und die Immunisierung, welche die Erwartungsveränderung verhindert. Dabei benennt es zwei Strategien, die zur Immunisierung angewendet werden können: eine Daten-orientierte und eine Konstrukt-orientierte Strategie. Bei der Daten-orientierten Strategie wird die spezifische Erwartungsverletzung neubewertet, indem die Häufigkeit ihres Auftretens mit eingebunden wird (z.B. „Die anderen waren heute Abend nur ausnahmsweise nett zu mir. Normalerweise interessieret sich keiner für mich."). Bei der Konstrukt-orientierten Strategie wird das Konstrukt, welches in der spezifischen Situation salient ist, neubewertet (z.B. „Nur weil Toni heute nett zu mir war, heißt das noch lange nicht, dass er mich gut leiden kann."; Panitz et al., 2021; Rief et al., 2015).

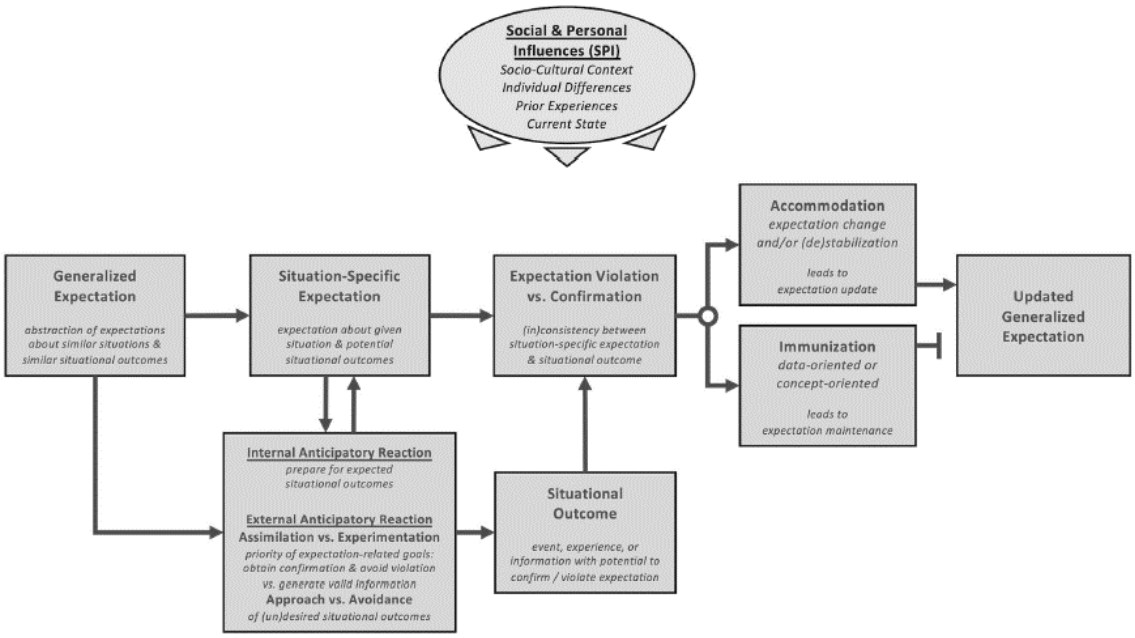


Abbildung 2. Das ViolEx-Model 2.0 von Panitz et al., 2021

Der Einfluss von *kognitiver Immunisierung* auf die Persistenz dysfunktionaler Erwartungen bei Menschen mit depressiven Symptomen und Störungen wurde in verschiedenen Studien experimentell untersucht (Kube, 2023). In einer Studie von Kube, Rief et al. (2019) wurde bei Menschen mit depressiven Symptomen untersucht inwiefern sie ihre Leistungserwartungen in Reaktion auf positives Leistungsfeedback verändern. Dabei wurde *kognitive Immunisierung* in einer Bedingung gefördert und in einer anderen gehemmt. Die Teilnehmenden in der Immunisierungs-hemmenden Bedingung verbesserten ihre Leistungserwartungen in Reaktion auf ein überraschend positives Feedback nach einem Leistungstest, während die Teilnehmenden in der Immunisierungs-fördernden Bedingung dies nicht taten. In weiteren Studien ließ sich nachweisen, dass die experimentelle Manipulation von *kognitiver Immunisierung* auf die Erwartungsveränderung bei Menschen ohne depressive Symptome keinen Einfluss hat (Kube & Glombiewski, 2021, 2022). Diese Befunde begründen die Annahme von Kube et al. (2020), dass *kognitive Immunisierung* ein Mechanismus ist, der spezifisch für depressive Symptome und Störungen ist.

In einem Artikel zur Rolle von Erwartungen bei depressiven Störungen stellen Rief und Joormann (2019) die Hypothese auf, dass Patient*innen mit persistierender depressiver Störung mehr Immunisierungsstrategien anwenden als Menschen mit episodischer depressiver Störung. Diese Hypothese leitet sich aus den psychopathologischen Unterschieden zwischen Menschen mit persistierender depressiver Störung und Menschen mit episodischer depressiver Störung ab. Beispielsweise leiden Menschen mit persistierender depressiver Störung häufiger unter dysfunktionalen Kognitionen (Riso et al., 2003), weisen größere Schwierigkeiten im Ausdruck ihrer Gefühle auf (van Randenborgh et al., 2012) und neiden stärker zu emotionaler, kognitiver und verhaltensbezogener Vermeidung (Brockmeyer et al., 2015).

2.4 Affektive Mechanismen

2.4.1 State Affekt

Aus der Grundlagenforschung ist bekannt, dass Affekt einen Einfluss auf kognitive Prozesse hat. Beispielsweise führt positiver Affekt zu mehr positiven und weniger negativen Zukunftsvorhersagen (Paul & Pourtois, 2017), während negativer Affekt zu mehr negativen und weniger positiven Zukunftsvorhersagen führt (Mayer et al., 1992; Wright & Bower, 1992). Weiterhin fördert positiver Affekt das Lernen (Bakic et al., 2014) und die kognitive Flexibilität (Dreisbach & Goschke, 2004; Goschke & Bolte, 2014), während negativer Affekt kognitive Transferleistungen, das Lernen (Brand et al., 2007) und die Berücksichtigung von Kontextinformationen erschwert (Masuyama & Mochizuki, 2020). Nach dem *Mood-Congruency Approach* von Ziegler (2010, 2019), werden Informationen dann besser verarbeitet, wenn sie in ihrer Valenz mit dem State Affekt der verarbeitenden Person übereinstimmen. Das bedeutet, dass Menschen, die negativen Affekt erleben, gut darin sind, negative Informationen zu verarbeiten, aber Schwierigkeiten bei der Verarbeitung positiver Informationen haben. Menschen mit positivem State Affekt haben im Gegensatz dazu Schwierigkeiten bei der Verarbeitung negativer Informationen, aber nicht bei der Verarbeitung positiver. Dieser Ansatz findet sich auch

in Studien zum *interoceptive predictive processing* wieder, nach welchen Menschen ihre Interozeption als zusätzliche Informationsquelle bei der Bewertung von äußerem Input nutzen (Allen, 2019; Barrett et al., 2016; Barrett & Simmons, 2015). Da ein Kernmerkmal depressiver Störungen negativer Affekt ist (American Psychiatric Association, 2013; World Health Organization, 2016), ist es insofern plausibel, dass dieser bei Menschen mit depressiver Störung die Erwartungsveränderung in Reaktion auf positive Informationen hemmt und in Reaktion auf negative Informationen fördert.

In einer Studie zu diesem Thema konnte gezeigt werden, dass Menschen mit depressiver Störung ihre Leistungserwartungen in Reaktion auf positives Feedback weniger in positive Richtung veränderten, wenn ihnen zuvor negativer (versus positiver) Affekt induziert wurde (Kube et al., 2023). Ähnlich zeigte sich in einer Studie von Ramos-Grille et al. (2022), dass Teilnehmende mit depressiver Störung im Vergleich zu Teilnehmenden ohne depressive Störung eine geringere Flexibilität in der Veränderung ihrer Vorhersagen zeigten und dass dies nach der Induktion von Traurigkeit besonders stark ausgeprägt war. Bei Personen ohne depressive Störung zeigt sich dahingegen ein gemischtes Bild: In zwei Studien von Kube und Glombiewski (2021) und Kube et al. (2023) beeinflusste die Induktion von Traurigkeit weder bei Teilnehmenden ohne noch bei Teilnehmenden mit subklinischen depressiven Symptomen die Veränderung ihrer Leistungserwartungen. Gleichzeitig zeigte sich in den Daten, dass die Erwartungsveränderung mit zunehmendem Schweregrad der depressiven Symptome abnahm und dass dies bei Teilnehmenden, bei denen Traurigkeit induziert wurde, besonders ausgeprägt war. In einer neueren Studie, in welcher der Einfluss von Affekt auf die Veränderung des Selbstbildes nach positivem Feedback bei einer nicht-klinischen Stichprobe untersucht wurde, zeigte sich dahingegen, dass die Induktion von negativem Affekt (im Gegensatz zu einer Induktion von positivem Affekt) auch bei Menschen ohne depressive Symptome die Integration von positivem Feedback in das Selbstbild erschwerte (Kube & Korn, 2025).

Da affektive Zustände in der Regel nicht auf eine passive Art und Weise erlebt werden, sondern Menschen vielmehr aktiv auf diese reagieren (Joormann & Stanton, 2016), können neben dem State Affekt auch Besonderheiten in der Affektregulation bei Menschen mit depressiven Störungen die Erwartungsveränderung hemmen beziehungsweise fördern, weswegen diese ebenfalls im vorliegenden Dissertationsvorhaben berücksichtigt werden sollen.

2.4.2 Affektregulation

Affektregulation wird definiert als ein Prozess, bei dem Menschen Einfluss darauf nehmen, welchen Affekt sie fühlen, wann sie ihn fühlen und wie sie ihn erleben und zum Ausdruck bringen. Dies kann automatisch oder kontrolliert beziehungsweise bewusst oder unbewusst ablaufen (Gross, 1998). Menschen mit depressiven Störungen weisen Besonderheiten in der Affektregulation auf, was in einem verstärkten Erleben von negativem und einem reduzierten Erleben von positivem Affekt resultiert (Joormann & Stanton, 2016).

Eine bei depressiven Störungen häufige Form der Affektregulation stellt die *Rumination* dar (Joormann & Stanton, 2016; Nolen-Hoeksema et al., 2008). *Rumination* wird definiert als eine Reaktion auf negativen Affekt, bei welcher sich die Betroffenen gedanklich repetitiv auf den negativen Affekt sowie dessen Ursachen und dessen Bedeutung fokussieren (Nolen-Hoeksema et al., 2008). Nach der *impaired cognitive disengagement hypothesis* von Koster et al. (2011) führt dies dazu, dass es immer schwerer wird sich von negativem kognitiven Material zu lösen, was zu einer Aufrechterhaltung beziehungsweise Intensivierung des negativen Affektes führt (Vickers & Vogeltanz-Holm, 2003). In Studien, die den Zusammenhang zwischen *Rumination* und kognitiven Verzerrungen und Auffälligkeiten untersuchten, zeigte sich, dass *Rumination* mit einem negativen Aufmerksamkeits-Bias (Donaldson et al., 2007), einer Übergeneralisierung von negativen Gedächtnisinhalten (Park et al., 2004), einer reduzierten Problemlösefähigkeit (Watkins & Moulds, 2005) und einer geringeren kognitiven Kontrolle

(Joormann, 2006; Joormann & Gotlib, 2008, 2010; Joormann et al., 2011; Philippot & Brutoux, 2008; Watkins & Brown, 2002; Whitmer & Gotlib, 2012) zusammenhängt.

Neuere Arbeiten legen nahe, dass Rumination nicht nur in Reaktion auf negativen, sondern auch auf positiven Affekt erfolgen kann. Dies beinhaltet auch Versuche, den positiven Affekt abzuschwächen, was als *Dampening* bezeichnet wird (Joormann & Stanton, 2016). Konkret wird *Dampening* definiert als kognitives Runterregulieren von positivem Affekt durch die negative Bewertung positiver Erfahrungen (Bean et al., 2022). *Dampening* wurde bereits mit depressiven Störungen in Zusammenhang gebracht und stellt eine weitere Erklärung für das verstärkte Erleben von negativem und das reduzierte Erleben von positivem Affekt bei depressiven Störungen dar (Bean et al., 2022; Raes et al., 2012; Werner-Seidler et al., 2013). In einer Studie von Everaert et al. (2020) zeigte sich, dass der Zusammenhang zwischen kognitiver Inflexibilität und depressiven Symptomen durch *Dampening* mediiert wird.

Eine weitere Affektregulationsstrategie, die mit depressiven Störungen im Zusammenhang steht, ist das Unterdrücken, auch genannt *Suppression* (Beblo et al., 2012; Campbell-Sills et al., 2006). *Suppression* wird definiert als der Versuch, affektive Reaktionen zu reduzieren. Affektive Reaktionen beinhaltet dabei den Ausdruck von Affekt (z.B. weinen bei Traurigkeit) sowie seine psychologischen (z.B. Erinnerungen zulassen) und psychophysiologischen (z.B. Erschöpfung) Charakteristiken (Beblo et al., 2012). In einer früheren Arbeit wurde ein Zusammenhang zwischen *Suppression* und eingeschränkter Gedächtnisfunktion hergestellt (Gross, 2002). Weitere Studien zeigen, dass *Suppression* mit einem stärkeren Erleben von negativem (Campbell-Sills et al., 2006; Gross & John, 2003) beziehungsweise einem reduzierten Erleben von positivem Affekt (Gross & John, 2003) in Verbindung steht.

2.5 Selektives Feedbacksuchverhalten

Die oben beschriebene kognitive Immunisierung sowie die affektiven Mechanismen können die Erwartungsveränderung beeinflussen nachdem eine Person mit einer neuen,

erwartungsinkongruenten Information konfrontiert wurde. Je nach Situation haben Menschen jedoch die Möglichkeit durch ihr Verhalten zu steuern, ob sie sich einer solchen Information aussetzen oder nicht. Aus dem Forschungsfeld des Informationssuchverhaltens ist bekannt, dass Menschen aktiv entscheiden, ob sie bestimmte Information erhalten wollen oder nicht und, dass sie dabei unterschiedliche Motive haben, die diese Entscheidung beeinflussen (Sharot & Sunstein, 2020). Eine Informationsquelle, die im Zusammenhang mit depressiven Störungen bedeutsam sein kann, stellt interpersonelles Feedback dar: Menschen mit depressiven Störungen weisen häufig ein negatives Selbstbild auf (Gara et al., 1993; Pietromonaco & Markus, 1985; Swallow & Kuiper, 1988). Dieses negative Selbstbild kann durch positives Feedback korrigiert werden. Jedoch weisen Menschen mit depressiven Symptomen eine Tendenz auf, negatives Feedback gegenüber positivem Feedback zu bevorzugen, was in der englischsprachigen Literatur als *negative feedback-seeking* bezeichnet wird (Giesler et al., 1996; Wakeling et al., 2020) und im Zusammenhang mit der Persistenz depressiver Symptome steht (Borelli & Prinstein, 2006; Evraire & Dozois, 2011; Joiner et al., 1993).

Erklärungen dafür warum Menschen bestimmtes Feedback bevorzugt aufsuchen während sie anderes vermeiden, lassen sich aus zwei Theoriesträngen ableiten: Theorien der *Self-Consistency* beziehungsweise *Self-Verification* und Theorien des *Self-Enhancement* (Kwang & Swann, 2010). Nach Theorien der *Self-Consistency*, bevorzugen Menschen Feedback, welches mit ihrer Selbstwahrnehmung im Einklang steht. Selbstkonsistentes Feedback wird demnach deshalb bevorzugt, da es Menschen ein Gefühl von Kohärenz, Kontrolle und Sicherheit gibt, was es ihnen wiederum erleichtert, Vorhersagen zu treffen und ihr Verhalten zu steuern (Swann, 2012). Belege für diese Theorie finden sich in der Forschung zum Informationssuchverhalten, wonach Menschen bevorzugt solche Informationen erhalten, welche die eigenen Überzeugungen bestätigen (Jonas et al., 2001; Meppelink et al., 2019; Westerwick et al., 2017).

Daneben besteht nach den Theorien zum *Self-Enhancement* ein zentrales menschliches Bedürfnis danach, ein positives Selbstbild aufzubauen und zu erhalten, was nahe legt, dass Menschen positives gegenüber negativem Feedback bevorzugen (Leary, 2007). Für Menschen mit einem positiven Selbstbild schließen sich die beiden Theorien nicht gegenseitig aus, da positives Feedback, das bereits bestehende positive Selbstbild festigt und bestätigt (Swann et al., 1987). Bei Menschen mit einem negativen Selbstbild, wie es sich beispielsweise häufig bei Menschen mit depressiven Symptomen zeigt, wäre ein selbstbestätigendes Feedback jedoch in der Tendenz negativ und würde somit nicht zum Aufbau eines positiven Selbstbildes beitragen (Giesler et al., 1996).

3. Darstellung des Dissertationsvorhabens

3.1 Relevanz und Herleitung der Fragestellung

Dysfunktionale Erwartungen stellen ein zentrales Merkmal depressiver Störungen dar (Kube, Siebers et al., 2018; Rief & Joormann, 2019; Strunk & Adler, 2009). Dabei nehmen sie Einfluss auf den Krankheitsverlauf und den Behandlungserfolg (Gopinath et al., 2007; Gordon et al., 2011; Ludman et al., 2003; Meyer et al., 2002; Meyerhoff & Rohan, 2016). Es ist somit von zentraler Bedeutung, dass Menschen mit depressiven Störungen positive Erwartungen entwickeln, in Bezug auf sich selbst, ihre Umwelt, aber auch bezüglich der antidepressiven Behandlung. Dies stellt insofern eine besondere Herausforderung dar, da depressive Symptome und Störungen häufig mit der Tendenz einhergehen, dysfunktionale Erwartungen aufrecht zu erhalten und zwar auch trotz positiver erwartungsverletzender Erfahrungen (Everaert et al., 2018; Kube, Rief et al., 2019; Liknaitzky et al., 2017). Das Phänomen der Persistenz dysfunktionaler Erwartungen bei depressiven Störungen bekam in den letzten Jahren zunehmend Aufmerksamkeit und es wurden diverse Mechanismen, welche die Veränderung dysfunktionaler Erwartungen hemmen beziehungsweise fördern, untersucht (Kube, 2023). Gleichzeitig bestehen noch einige Lücken, welche mit Hilfe des vorliegenden Dissertationsvorhabens geschlossen werden sollen.

Ein zentrales und gut erforschtes Konstrukt stellt die *kognitive Immunisierung* dar (Panitz et al., 2021; Rief et al., 2015). Die dabei angewendeten experimentellen Paradigmen bezogen sich vor allem auf den spezifischen Kontext der Leistungserwartungen oder der sozialen Erwartungen, wobei ein starker Fokus auf die interne Validität gelegt wurde (Kube, 2023). Entsprechend fehlte es noch an experimentellen Paradigmen, die den Fokus auf die externe Validität legen. Dieses Dissertationsvorhaben versucht diese Lücke zu schließen, indem ein neues experimentelles Paradigma entwickelt wurde, bei welchen Patient*innen, die sich in der Anbahnung oder am Anfang einer ambulanten Psychotherapie befanden, auf Video aufgezeichnete

positive Therapie-Erfahrungsberichte gezeigt wurden. Das Paradigma wurde zunächst an einer kleinen Patient*innen-Stichprobe auf seine Machbarkeit hin überprüft (Artikel 1). In einem nächsten Schritt wurde eine experimentelle Studie durchgeführt, in welcher anhand einer großen Patient*innen-Stichprobe untersucht wurde, ob die Patient*innen die Erfahrungsberichte nutzen können, um die eigenen Erwartungen an Psychotherapie im speziellen sowie an das Erleben positiver und negativer Lebensereignisse im Allgemeinen in positive Richtung zu verändern. Dabei wurde der Einfluss von kognitiver Immunisierung auf die Erwartungsveränderung in Abgrenzung zu anderen kognitiven Mechanismen (Interpretation-Bias und eingeschränktes Erinnerungsvermögen) untersucht. Es wurde angenommen, dass die Förderung von kognitiver Immunisierung die Erwartungsveränderung hemmt und die Hemmung von kognitiver Immunisierung die Erwartungsveränderung begünstigt (Artikel 2). In einem weiteren Artikel wurde die oben beschriebene Hypothese von Rief und Joormann (2019) aufgegriffen, indem Unterschiede zwischen Patient*innen mit persistierender depressiver Störung und Patient*innen mit episodischer depressiver Störung in der Erwartungsveränderung und in der Anwendung von kognitiven Immunisierungsstrategien untersucht wurden. Es wurde angenommen, dass Menschen mit persistierender depressiver Störung im Vergleich zu Menschen mit episodischer depressiver Störung stärker an ihren Ursprungserwartungen festhalten und dass sich dies durch eine stärkere Anwendung von kognitiver Immunisierung erklären lässt (Artikel 3).

Bisherige Studien, die sich mit der Persistenz dysfunktionaler Erwartungen bei Menschen mit depressiven Störungen auseinandersetzten, haben sich vor allem auf kognitive Mechanismen fokussiert. Dabei gibt es nur wenige Studien, die affektive Mechanismen in den Fokus nehmen (Kube, 2023). Affektive Mechanismen können insofern bedeutsam sein, da sie kognitive Prozesse beeinflussen können (Bakic et al., 2014; Brand et al., 2007; Dreisbach & Goschke, 2004; Goschke & Bolte, 2014; Masuyama & Mochizuki, 2020; Mayer et al., 1992; Paul & Pourtois, 2017; Wright & Bower, 1992). Bezüglich der Erwartungsveränderung bei

Menschen mit depressiver Störung konnten Kube et al. (2023) zeigen, dass Menschen mit depressiver Störung ihre Leistungserwartungen in Reaktion auf positives Feedback weniger in positive Richtung verändern, wenn ihnen zuvor negativer (versus positiver) Affekt induziert wurde. Zur Replikation und Erweiterung dieses Befunds wurde im Rahmen des vorliegenden Dissertationsvorhabens eine experimentelle Studie an einer Patient*innen-Stichprobe durchgeführt, bei welcher untersucht wurde, welche Rolle State Affekt und Affektregulation für die Veränderung von Leistungserwartungen spielen. Aufbauend auf dem *Mood-Congruency Approach* (Ziegler, 2010, 2019) wurde angenommen, dass die Erwartungsveränderung dann größer ist, wenn die Valenz des Feedbacks nach einem Leistungstest (positiv versus negativ) mit der Valenz des State Affekts (Heiterkeit versus Traurigkeit) übereinstimmt. Weiterhin wurde angenommen, dass Rumination den Effekt der Induktion von Traurigkeit verstärkt, Suppression die Erwartungsveränderung insgesamt hemmt und Dampening die Erwartungsveränderung in Reaktion auf positives Feedback hemmt (Artikel 4).

Neben kognitiven und affektiven Mechanismen können auch verhaltensbezogene Mechanismen im Prozess der Erwartungsveränderung wirksam sein, da Menschen durch ihr Verhalten steuern können, ob sie mit neuen, erwartungsinkongruenten Informationen konfrontiert werden (Sharot & Sunstein, 2020). Eine Informationsquelle, die zur Veränderung interpersoneller Erwartungen beitragen kann, stellt interpersonelles Feedback dar. Im Rahmen des vorliegenden Dissertationsvorhabens soll daher untersucht werden, ob es einen Zusammenhang zwischen dem Schweregrad depressiver Symptome und dem Feedbacksuchverhalten gibt. Dabei wurden zwei Studien durchgeführt. In einer ersten Studie sollte zunächst untersucht werden, ob der Schweregrad depressiver Symptome mit der Inkongruenz zwischen der Selbst- und der erwarteten Fremdwahrnehmung (sogenannte Metawahrnehmung) zusammenhängt. Darauf aufbauend, wurde an einer größeren Stichprobe untersucht, ob diese Inkongruenz den Zusammenhang zwischen dem Schweregrad depressiver Symptome und dem Feedbacksuchverhalten

erklärt. Weiterhin wurde untersucht, ob die Valenz des Feedbacks den Zusammenhang zwischen dem Schweregrad depressiver Symptome und dem Feedbacksuchverhalten erklärt. Aufbauend auf Theorien zum *Self-Enhancement* (Leary, 2007) wurde angenommen, dass positives gegenüber negativem Feedback insgesamt bevorzugt wird. Gleichzeitig wurde, aufbauend auf den Theorien zur *Self-Consistency* (Swann, 2012), angenommen, dass das Feedbacksuchverhalten bezüglich positivem Feedback mit zunehmendem Schweregrad depressiver Symptome abnimmt und das Feedbacksuchverhalten bezüglich negativem Feedback zunimmt (Artikel 5).

Die Hypothesen dieses Dissertationsvorhabens sind in Abbildung 3 grafisch zusammengefasst.

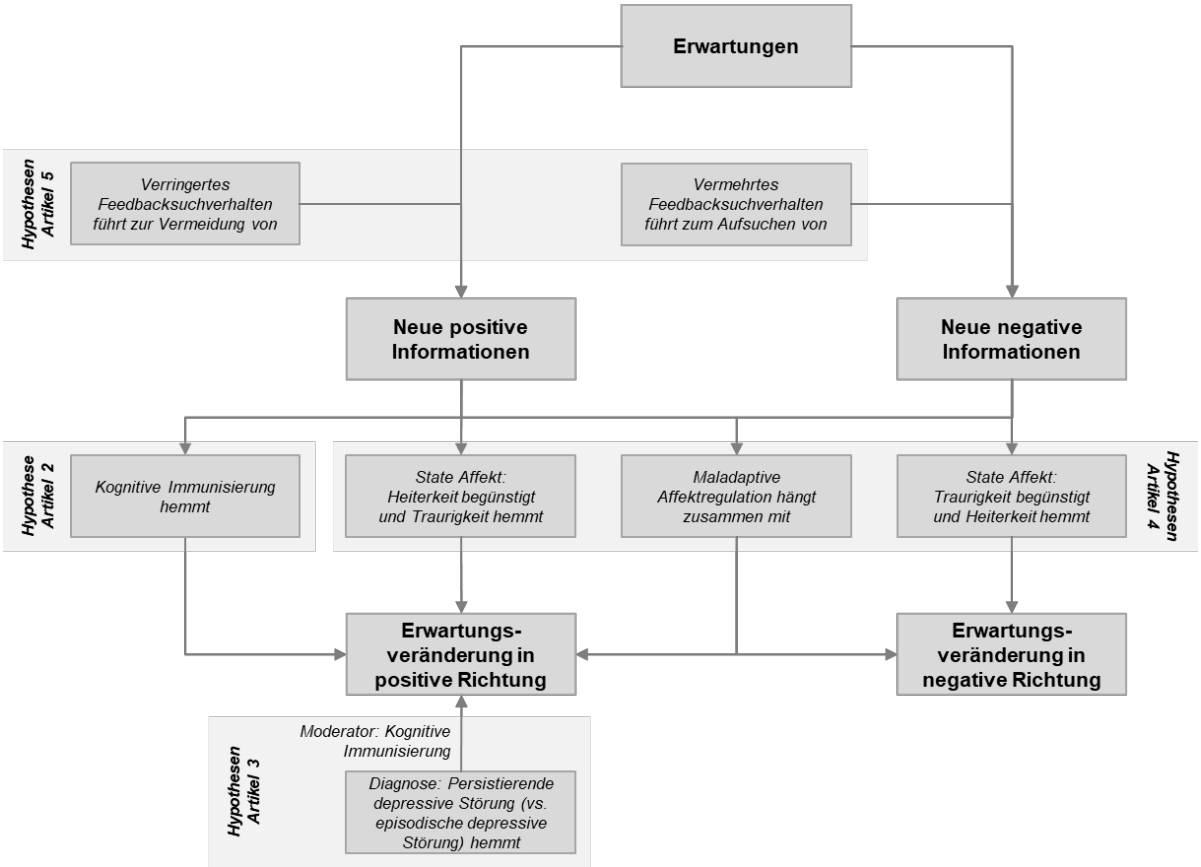


Abbildung 3. Zusammenfassende Darstellung der Hypothesen

Anmerkung. Da in Artikel 1 keine inferenzstatistische Hypothesentestung stattfand, sind die Fragestellungen von Artikel 1 nicht in der Abbildung dargestellt.

3.2 Fragestellungen des Dissertationsvorhabens

Im Rahmen von fünf wissenschaftlichen Artikeln wurden die folgenden Fragestellungen untersucht:

Artikel 1: Wie ist die Machbarkeit eines neu entwickelten, ökologisch validen Paradigmas, mit welchem untersucht werden soll, wie Patient*innen mit depressiven Störungen von den Therapieerfahrungsberichten anderer Patient*innen lernen können und welche Rolle dabei kognitive Immunisierung spielt, zu beurteilen?

Artikel 2: Beeinflussen positive Therapie-Erfahrungsberichte die Erwartungen an die eigene Psychotherapie und an das Erleben von positiven und negativen Lebensereignissen von Patient*innen mit depressiven Störungen und welche Rolle spielt dabei kognitive Immunisierung?

Artikel 3: Unterscheiden sich Patient*innen mit episodischer depressiver Störung von Patient*innen mit persistierender depressiver Störung in ihrer Erwartungsveränderung und lässt sich dies durch Unterschiede in der kognitiven Immunisierung erklären?

Artikel 4: Beeinflusst State Affekt bei Patient*innen mit depressiven Störungen die Veränderung von Leistungserwartungen in Reaktion auf positives und negatives Leistungsfeedback? Hat Affektregulation dabei einen zusätzlichen Erklärungswert?

Artikel 5: Gibt es einen Zusammenhang zwischen dem Schweregrad depressiver Symptome und der Inkongruenz zwischen der Selbst- und der erwarteten Fremdwahrnehmung (Meta-Wahrnehmung)? Gibt es einen Zusammenhang zwischen dem Schweregrad depressiver Symptome und dem Feedbacksuchverhalten und lässt sich dieser durch die Inkongruenz zwischen Selbst- und Metawahrnehmung und die Valenz des Feedbacks erklären?

4. Zusammenfassung der wissenschaftlichen Artikel

4.1 Artikel 1: "Learning from other patients - A feasibility study to establish an ecologically valid paradigm to modify negative expectations in depression through authentic psychotherapeutic treatment reports"

Rapo, E., Rief, W., & Kube, T. (2023). Learning from other patients - A feasibility study to establish an ecologically valid paradigm to modify negative expectations in depression through authentic psychotherapeutic treatment reports. *Journal of Behavioral and Cognitive Therapy, 33*, 195-206. https:// doi.org/10.1016/j.jbct.2023.10.001

Hintergrund: Erwartungen, die Patient*innen an ihre psychotherapeutische Behandlung haben, können das Therapieergebnis beeinflussen. Deswegen ist es wichtig, dass Patient*innen positive Erwartungen an ihre Psychotherapie richten. Dies hat bei Patient*innen mit depressiven Störungen eine besondere Relevanz, da depressive Störungen mit negativen Erwartungen und der Tendenz diese trotz erwartungsverletzender, positiver Informationen aufrecht zu erhalten, assoziiert sind. In diesem Artikel wurde die Machbarkeit eines neuen, ökologisch validen experimentellen Paradigmas untersucht. Mit diesem Paradigma soll untersucht werden, inwiefern Patient*innen mit depressiven Störungen ihre eigenen Erwartungen in Reaktion auf positive Erfahrungsberichte anderer Patient*innen verändern und welche kognitiven Mechanismen (kognitive Immunisierung, Interpretations-Bias und eingeschränktes Erinnerungsvermögen) die Erwartungsveränderung beeinflussen können.

Methode: Die Stichprobe umfasste $N = 17$ ambulante Patient*innen mit einer depressiven Störung. Die Teilnehmenden schauten sich Videos an, in denen Schauspielpatient*innen

über ihre Erfahrungen mit Psychotherapie sprachen. Dabei wurde jede*r Schauspielpatient*in in zwei separaten Videos gezeigt: Das erste Video zeigte sie bevor die Psychotherapie begann. In diesem Video äußerten sich die Schauspielpatient*innen pessimistisch bezüglich ihrer Zukunft und zeigten eine deutliche depressive Symptomatik. Das zweite Video zeigte sie am Ende der psychotherapeutischen Behandlung. Hier berichteten die Schauspielpatient*innen von den Verbesserungen in ihrem Befinden und darüber, wie sie gelernt haben, die Stressoren in ihrem Leben besser zu bewältigen. Es gab vier experimentelle Bedingungen: In Bedingung 1 sollte kognitive Immunisierung gehemmt werden, indem sich die Teilnehmenden beim Schauen der Videos auf Gemeinsamkeiten zwischen sich und den Personen in den Videos konzentrieren und diese in einem offenen Textfeld notieren sollten. In Bedingung 2 sollte kognitive Immunisierung gefördert werden, indem sich die Teilnehmenden beim Schauen auf Unterschiede zwischen sich und den Personen in den Videos konzentrieren und diese in einem offenen Textfeld notieren sollten. Bedingung 3 stellte eine aktive Kontrollbedingung dar, in welcher die Teilnehmenden abgelenkt werden sollten, indem sie sich auf äußere Merkmale der Personen in den Videos konzentrieren und diese in einem offenen Textfeld notieren sollten. Bedingung 4 stellte eine Kontrollbedingung ohne spezifische Instruktion dar. Die Instruktionen erfolgten jeweils vor dem Schauen des zweiten Videos, in welchem vom Ende der Therapie berichtet wurde. Danach wurde kognitive Immunisierung erhoben. Um in zukünftigen Studien sicherstellen zu können, dass sich die Unterschiede in der Erwartungsveränderung zwischen den experimentellen Bedingungen auf kognitive Immunisierung und nicht auf andere kognitive Mechanismen zurückführen lassen, wurden zusätzlich noch Interpretations-Bias und Erinnerungsvermögen erhoben. Alle drei Konstrukte wurden mittels selbst entwickelter Items erhoben. Zu Beginn und am Ende der Studie wurden die Erwartungen bezüglich des Erlebens positiver und negativer Lebensereignisse mittels einer adaptieren Version des „Future events questionnaires“ (FEQ) erhoben.

Ergebnisse: Bezüglich der Machbarkeit zeigte das schriftliche und mündliche Feedback der Teilnehmenden, dass alle Instruktionen und Inhalte des Paradigmas verständlich waren. $N = 4$ berichteten, dass sie die Erfahrungsberichte interessant fanden, $n = 3$ fanden es schwierig, Gemeinsamkeiten beziehungsweise Unterschiede zwischen sich und den Personen in den Videos zu finden, $n = 1$ hätte sich mehr Informationen über die Ursachen depressiver Störungen gewünscht, $n = 3$ vermuteten, dass es sich bei den Personen in den Videos nicht um echte Patient*innen handelte, $n = 1$ berichtete, dass es erleichternd gewesen sei, dass die Personen in den Videos so offen über ihre Krankheit berichtet haben. Eine sehr häufige Rückmeldung war, dass die Studie sehr lang und erschöpfend war. Bezüglich der Adhärenz zeigte sich, dass alle Teilnehmenden die offenen Textfelder nutzen, um ihre Beobachtungen bezüglich der Gemeinsamkeiten, Unterschiede oder des Aussehens zu notieren. Die Teilnehmenden gaben im Schnitt für eins der fünf Videos unspezifische Antworten, $M = 0.2$, $R = 0\text{-}4$. Sie bezogen sich bei ihren Beobachtungen auf $M = 2.38$ ($SD = 0.57$) Themenbereiche (z.B. Symptome, Beziehungen, Lebensumstände) beziehungsweise in der Ablenkungsbedingung auf $M = 2.92$ ($SD = 0.48$) äußerliche Merkmale (z.B. Haare, Klamotten, Mimik). Bezüglich kognitiver Immunisierung lassen sich folgende Ergebnisse festhalten: Über alle Bedingungen hinweg schwankte kognitive Immunisierung zwischen $M = 2.45$ und $M = 2.88$ ($SD = 0.60$), was auf eine geringe bis moderate Ausprägung von kognitiver Immunisierung auf der siebenstufigen Skala hinwies. Die Items zur kognitiven Immunisierung beinhalteten auch je ein negativ gepoltes Item zur Glaubwürdigkeit und Authentizität der Videos. Hier betrugen die Werte $M = 1.58$ ($SD = 0.63$) für Glaubwürdigkeit und $M = 1.82$ ($SD = 0.63$) für Authentizität, was für eine hohe Glaubwürdigkeit und Authentizität spricht. Hinsichtlich der Erwartungsveränderung zeigte sich, dass über alle Bedingungen hinweg die Erwartungen auf der fünfstufigen Skala bezüglich positiver Lebensereignisse stiegen, t_1: $M = 2.92$, $SD = 0.59$, t_2: $M = 3.15$, $SD = 0.72$, und bezüglich negativer Lebensereignisse abnahmen, t_1: $M = 3.07$, $SD = 0.64$, t_2: $M = 2.99$, $SD = 0.79$.

Diskussion: Das Ziel der Studie bestand darin, ein neues, ökologisch valides experimentelles Paradigma zur Erfassung von Erwartungsveränderungen zu entwickeln und in seiner Machbarkeit zu überprüfen. Die Ergebnisse der Studie weisen darauf hin, dass das Paradigma gut anwendbar ist und sich die Teilnehmenden an die vorgegebenen Instruktionen hielten und diese gut verstanden. Die Teilnehmenden erlebten die Videos als hilfreich, interessant und glaubwürdig. Gleichzeitig gab es drei Teilnehmende, die die Echtheit der Patient*innen in den Videos anzweifelten. Die Studie wurde als zu lang erlebt. Um Ermüdungseffekte zu verhindern, könnte das Paradigma zukünftig gekürzt werden, zum Beispiel indem die Videos von vier anstelle von fünf Schauspielpatient*innen gezeigt werden. Insgesamt zeigte sich, dass die Erwartungen über alle Bedingungen hinweg leicht positiver und etwas weniger negativ wurden. Auf Grund der kleinen Stichprobengröße lassen sich aber keine robusten Befunde ableiten. Die kleine Stichprobengröße stellt die wichtigste Limitation der Studie dar. Auf Grund der kleinen Stichprobe konnten die psychometrischen Eigenschaften der Messinstrumente nicht überprüft werden. Eine große Stärke des Paradigmas stellt die hohe ökologische Validität und der Einbezug des psychotherapeutischen Kontextes dar, was es zu einem nützlichen Instrument für größere Follow-Up-Studien machen kann.

4.2 Artikel 2: „How people with major depression adjust their expectations of future life events in response to other patients' reports of the positive effects of psychotherapy"

Kube, T., Rapo, E., Glombiewski, J. A., & Rief, W. (2025). How people with major depression adjust their expectations of future life events in response to other patients' reports of the positive effects of psychotherapy. *Behaviour Research and Therapy, 189*, 104736. https:// doi.org/10.1016/j.brat.2025.104736

Hintergrund: Die Tendenz, negative Erwartungen trotz positiver erwartungsverletzender Erfahrungen aufrechtzuerhalten, stellt ein zentrales Merkmal depressiver Störungen dar. Bisherige Studien konnten nachweisen, dass kognitive Immunisierung gegenüber positiven Informationen ein Mechanismus ist, welcher die Veränderung von negativen Erwartungen hemmt. Bisher wurde kognitive Immunisierung nur im Kontext von Leistungserwartungen und sozialen Erwartungen untersucht. Das Ziel dieses Artikels war es somit, kognitive Immunisierung in einem anderen Kontext zu untersuchen, indem die Veränderung von Erwartungen bezüglich positiver und negativer Lebensereignisse sowie von Therapieerwartungen untersucht wurde.

Methode: Bei der Studie handelt es sich um ein between-subjects-Design mit vier experimentellen Bedingungen: Hemmung von kognitiver Immunisierung, Förderung von kognitiver Immunisierung, Ablenkung (als aktive Kontrollgruppe) und eine Kontrollgruppe. $N = 156$ ambulante Patient*innen mit einer depressiven Störung als primäre Behandlungsdiagnose schauten sich Videos von Schauspielpatient*innen an, die über ihre positiven Erfahrungen mit Psychotherapie berichteten. Kognitive Immunisierung wurde manipuliert, indem sich die

Teilnehmenden a) auf Gemeinsamkeiten (Hemmung von kognitiver Immunisierung) beziehungsweise Unterschiede (Förderung von kognitiver Immunisierung) zwischen sich selbst und den Personen in den Videos fokussieren sollten und b) überlegen sollten, was dafür (Hemmung von kognitiver Immunisierung) beziehungsweise dagegen (Förderung von kognitiver Immunisierung) spricht, dass eine Psychotherapie bei ihnen ähnlich wirksam sein wird wie bei den Personen in den Videos. In der Ablenkungsbedingung sollten sich die Teilnehmenden auf das äußere Erscheinungsbild der Personen in den Videos konzentrieren. Die Kontrollbedingung erhielt keine spezifische Instruktion. Am Anfang und am Ende der Studie wurden jeweils die Erwartungen bezüglich positiver und negativer Lebensereignisse mittels einer adaptierten Version des *Future Event Questionnaire* (FEQ) und die Psychotherapieerwartungen mittels des *Milwaukee Psychotherapy Expectations Questionnaire* (MPEQ) erhoben. Nach jedem Video wurde kognitive Immunisierung mittels der selbst entwickelten Skala *Cognitive Immunisation Against Other People's Experiences* (CIA-OPE) sowie der Interpretationsbias und das Erinnerungsvermögen erhoben.

Ergebnisse: Die Erwartungen bezüglich des Erlebens positiver und negativer Lebensereignisse verbesserten sich über alle Gruppen hinweg signifikant, $F(1, 152) = 45.198$, $p < .001$, $\eta_p^2 = .229$, 90% CI [.137, .318]. Jedoch gab es keine signifikanten Gruppenunterschiede, weder der Interaktionseffekt für Zeit x Gruppe, $F(3, 152) = .278$, $p = .841$, $\eta_p^2 = .005$, 90% CI [0, .017], noch der Haupteffekt für Gruppe, $F(1, 152) = .122$, $p = .947$, $\eta_p^2 = .002$, 90% CI [0, .001], waren signifikant. Auf Grund unbeabsichtigter Gruppenunterschiede in Alter und Geschlecht wurden zusätzliche Analysen mit diesen Faktoren als Kovariaten durchgeführt. Dabei zeigte sich, dass die Bedingung der Immunisierungsförderung bei Männern die Erwartungsveränderung hemmte, $F(1, 145) = 3.048$, $p = .031$, $\eta_p^2 = .059$, 90% CI [.003, .116]. Bezüglich der Therapieerwartungen zeigte sich, dass sich diese ebenfalls über alle Bedingungen hinweg verbesserten, $F(1, 152) = 65.388$, $p < .001$, $\eta_p^2 = .301$, 90% CI [.203, .388], es gab aber

keinen signifikanten Interaktionseffekt für Zeit x Gruppe, $F(3, 152) = 2.095$, $p = .103$, $\eta_p^2 = .040$, 90% CI [0, .086], und keinen signifikanten Haupteffekt für Gruppe, $F(3, 152) = 1.550$, $p = .204$, $\eta_p^2 = .030$, 90% CI [0, .070]. Die Mitaufnahme von Alter und Geschlecht als Kovariaten änderte nichts an den Ergebnissen zu den Therapieerwartungen. Kognitive Immunisierung hing signifikant mit einer negativen Interpretation der Videos zusammen, $r = .382$, $p < .001$. Es gab keinen signifikanten Zusammenhang zwischen kognitiver Immunisierung und dem Erinnerungsvermögen, $r = -.034$, $p = .670$.

Diskussion: Im Rahmen dieser Studie sollte der aus Vorstudien bestehende Befund, dass kognitive Immunisierung der gehemmten Veränderung negativer Erwartungen bei Menschen mit depressiven Störungen zugrunde liegt, repliziert werden. Der Befund ließ sich im Rahmen dieser Studie nicht replizieren, was daran liegen kann, dass die experimentelle Manipulation nicht stark genug war, die Videos nicht ausreichend Material für eine effektive Immunisierung boten, da es zu viele Ähnlichkeiten zwischen den Teilnehmenden und den Personen in den Videos gab oder die Skala nicht ausreichend dazu geeignet war, um kognitive Immunisierung zu erfassen. Es zeigten sich geschlechtsspezifische Effekte, was darauf hinweist, dass eine stärkere Fokussierung auf geschlechtsspezifische Unterschiede für zukünftige Studien sinnvoll sein kann.

4.3 Artikel 3: „Differences between persistent and episodic depression in processing novel positive information“

Kube, T., Rapo, E., Houben, M., Gärtner, T., Brakemeier, E.-L., Glombiewski, J. A., & Rief, W. (2025). Differences between persistent and episodic depression in processing novel positive information. *Psychological Medicine, 55*, e261, 1-12. https://doi.org/10.1017/S0033291725101530

Hintergrund: Episodische und persistierende depressive Störungen lassen sich durch bedeutsame psychopathologische Unterschiede voneinander abgrenzen. In diesem Artikel wurde untersucht, ob Menschen mit persistierender depressiver Störung im Vergleich zu Menschen mit episodischer depressiver Störung größere Schwierigkeiten in der Veränderung von Erwartungen haben. Dabei wurde zusätzlich untersucht, ob sich dies durch die verstärkte Anwendung von kognitiver Immunisierung erklären lässt.

Methode: Die Hypothesen wurden innerhalb der Studie aus Artikel 2 untersucht. Von den $N = 156$ Teilnehmenden wiesen $n = 54$ eine persistierende und $n = 102$ eine episodische depressive Störung auf.

Ergebnisse: Menschen mit persistierender depressiver Störung zeigten geringere Ausgangserwartungen an die Psychotherapie als Menschen mit episodischer depressiver Störung, $t(154) = 2.318$, $p = .022$, $d = 0.390$, 95% CI [0.057, 0.719], und veränderten diese in Reaktion auf die Erfahrungsberichte in einem geringeren Ausmaß in positive Richtung, $F(1, 154) = 5.716$, $p = .018$, $\eta_p^2 = .036$, 90% CI [.003, .095]. Die Unterschiede in der Erwartungsveränderung zwischen den beiden Patient*innen-Gruppen waren in der Immunisierungs-fördernden Bedingung besonders ausgeprägt, $t(37) = 2.271$, $p = .029$, $d = 0.833$,

95% CI [0.084, 1.571]. Es gab jedoch keine Unterschiede zwischen den beiden Patient*innengruppen auf den Skalen zur kognitiven Immunisierung, zum Interpretationsbias und zum Erinnerungsvermögen.

Diskussion: Im Rahmen dieses Artikels wurden die Unterschiede in der Veränderung dysfunktionaler Erwartungen und der Anwendung kognitiver Immunisierungsstrategien zwischen Personen mit episodischer und Personen mit persistierender depressiver Störung untersucht. Den Hypothesen entsprechend wiesen Menschen mit persistierender depressiver Störung im Vergleich zu Menschen mit episodischer depressiver Störung eine reduzierte Veränderung ihrer Erwartungen auf und dies war besonders ausgeprägt in der Immunisierungs-fördernden Bedingung. Diese Studie war die erste, in welcher die Unterschiede in der Erwartungsveränderung zwischen Menschen mit episodischer und Menschen mit persistierender depressiver Störung systematisch untersucht wurden. Gleichzeitig liefert die Studie keine zuverlässigen Aussagen bezüglich der zu Grunde liegenden Mechanismen, da es keine signifikanten Unterschiede zwischen den beiden Patient*innengruppen in den Skalen zur kognitiven Immunisierung, zum Interpretationsbias oder zum Erinnerungsvermögen gab.

4.4 Artikel 4: „Understanding Biased Expectation Change in Depression - The Influence of State Affect and Affect Regulation"

Rapo, E., Milde, C., Glombiewski, J. A., & Kube, T. (2024). Understanding Biased Expectation Change in Depression - The Influence of State Affect and Affect Regulation. *Cognitive Therapy and Research, 49*, 34-49, https://doi.org/10.1007/s10608-024-10560-3

Hintergrund: In bisherigen Studien, in denen das Phänomen der eigeschränkten Veränderung dysfunktionaler Erwartungen bei Menschen mit depressiven Störungen untersucht wurde, lag der Fokus vor allem auf kognitiven Mechanismen. Gleichzeitig gibt es noch wenig Studien mit dem Fokus auf affektiven Mechanismen. Daher wurde in diesem Artikel untersucht, welchen Einfluss State Affekt auf die Erwartungsveränderung bei Menschen mit depressiven Störungen hat und ob Affektregulation einen zusätzlichen Erklärungswert für die Erwartungsveränderung hat.

Methode: N = 80 ambulante Patient*innen mit einer depressiven Störung als primäre Behandlungsdiagnose bearbeiteten zwei Teile eines Leistungstests. In randomisierter Reihenfolge erhielten sie nach einem der beiden Teile positives und nach dem anderen Teil negatives Feedback (within-subjects-factor). Bei n = 40 der Teilnehmenden wurde jeweils vor beiden Teilen des Leistungstests Traurigkeit und bei n = 40 Heiterkeit induziert (between-subjects-factor). Die Leitungserwartungen wurden drei Mal erhoben: Vor dem ersten Teil des Leistungstests, nach dem ersten Feedback und nach dem zweiten Feedback. Am Ende der Studie wurden Rumination, Dampening und Suppression im Selbstbericht erfasst.

Ergebnisse: Über alle Teilnehmenden hinweg war die Veränderung der Leistungserwartungen nach negativem Feedback stärker als nach positivem Feedback, aufgabenspezifische Leistungserwartungen: $F(2, 156) = 11.41$, $p < .001$, $\eta^2 = 0.13$, 95% CI [0.05, 1.00];

generalisierte Leistungserwartungen: $F(2, 156) = 8.55$, $p < .001$, $\eta^2 = 0.1$, 95% CI [0.03, 1.00], es gab jedoch keine signifikanten Unterschiede in der Erwartungsveränderung zwischen den beiden Affektbedingungen, aufgabenspezifische Leistungserwartungen: $F(2, 156) = 1.35$, $p = .26$; generalisierte Leistungserwartungen: $F(2, 156) = 2.07$, $p = .13$. Rumination, Suppression und Dampening hatten im Modellvergleich keinen signifikanten zusätzlichen Erklärungswert für die Erwartungsveränderung. In der grafischen Exploration der Daten zeigten sich Hinweise darauf, dass es in der Bedingung „Traurigkeit“ (im Vergleich zur Bedingung „Heiterkeit“) eine verstärkte Erwartungsveränderung auf negatives Feedback gab, aber nur bei Teilnehmenden, die die Baseline-Erwartung hatten, dass der Test leicht wird, $p = .073$, Cohen’s d = -0.41, 95% CI [-0.86, 0.04]. Weiterhin zeigte sich in der grafischen Exploration, dass es in der Bedingung „Traurigkeit“ einen positiven Zusammenhang zwischen Rumination und Erwartungsveränderung nach negativem Feedback, einen negativen Zusammenhang zwischen Dampening und Erwartungsveränderung nach positivem Feedback und einen negativen Zusammenhang zwischen Suppression und der Erwartungsveränderung gab.

Diskussion: Im Rahmen dieser Studie wurde der Einfluss von Traurigkeit versus Heiterkeit auf die Erwartungsveränderung nach positivem versus negativem Feedback bei Menschen mit depressiver Störung untersucht. Anders als in Vorstudien hatte die Induktion von Traurigkeit versus Heiterkeit keinen Einfluss auf das Ausmaß der Erwartungsveränderung. Affektregulation hatte keinen zusätzlichen Erklärungswert für die Erwartungsveränderung. Potenzielle Erklärungen hierfür sind, dass die Power zu gering war, die Affektinduktion nicht nachhaltig genug war und das Studiendesign zu komplex war, was zu maskierten Effekten geführt haben kann. Grafische Analysen wiesen darauf hin, dass die Baseline-Erwartungen und die Affektregulation bei traurigen Teilnehmenden mit der Erwartungsveränderung zusammenhingen.

4.5 Artikel 5: „Better to keep a negative self-perception than ask for feedback? - How depressive symptoms are associated with the desire for social feedback"

Rapo, E., Milde, C., Glombiewski, J. A., & Kube, T. (2025). Better to keep a negative self-perception than ask for feedback? - How depressive symptoms are associated with the desire for feedback. *Behaviour Research and Therapy, 149*, https://doi.org/10.1016/j.brat.2025.104872

Hintergrund: Bisherige Studien haben gezeigt, dass Menschen mit depressiver Symptomatik negatives gegenüber positivem Feedback bevorzugen. Vorherige Arbeiten legen nahe, dass Menschen bevorzugt Feedback aufsuchen, von welchem sie erwarten, dass es konsistent mit ihrem Selbstbild ist (self-consistency) oder zu einer Verbesserung des Selbstwertes führt (self-enhancement). Um beurteilen zu können, ob ein potenzielles Feedback diese beiden Motive bedienen würde, müssen Menschen eine Vorstellung davon haben, wie andere sie wahrnehmen (Metawahrnehmung). Im Rahmen dieses Artikels wurde mittels zwei Studien zunächst untersucht, ob der Schweregrad depressiver Symptome mit einer Inkongruenz zwischen Selbst- und Metawahrnehmung assoziiert ist (Studie 1). Aufbauend auf den Ergebnissen von Studie 1 wurde in einer weiteren Studie untersucht, ob der Schweregrad depressiver Symptome mit dem Feedbacksuchverhalten zusammenhängt und ob sich dieser Zusammenhang durch die Inkongruenz zwischen Selbst- und Metawahrnehmung und durch die Valenz des Feedbacks erklären lässt (Studie 2).

Methode: In Studie 1 (N = 149) wurden den Versuchsteilnehmenden 20 positive und 20 negative Eigenschaftswörter präsentiert. Für jedes Wort sollten sie angeben, wie sie sich diesbezüglich selbst einschätzen (Selbstwahrnehmung) und was sie denken, wie andere sie

diesbezüglich einschätzen würden (Metawahrnehmung). In Studie 2 ($N = 212$) wurden dieselben Eigenschaftswörter präsentiert. Neben der Selbst- und Metawahrnehmung sollten die Teilnehmenden zusätzlich für jedes Wort angeben, wie gerne sie diesbezüglich Feedback erhalten würden. In beiden Studien fand eine dimensionale Erfassung depressiver Symptome mittels der deutschen, revidierten Version des Beck-Depressions-Inventars (BDI-II) statt.

Ergebnisse: Studie 1 zeigte, dass der Schweregrad depressiver Symptome mit einer stärkeren Inkongruenz zwischen Selbst- und Metawahrnehmung zusammenhing, $b_1 = 0.14$, $F(1, 147) = 31.68$, $p < .001$, $\eta_p^2 = 0.18$, 95% CI [0.08, 0.28], was sich dadurch äußerte, dass die Selbstwahrnehmung mit steigendem Schweregrad depressiver Symptome zunehmend negativ von der Metawahrnehmung abwich. In Studie 2 konnte dieser Befund repliziert werden, $b_1 = 0.19$, $F(1, 210) = 52.74$, $p < .001$, $\eta_p^2 = 0.2$, 95% CI [0.11, 0.29]. Weiterhin zeigte Studie 2, dass der Schweregrad depressiver Symptome mit einem verringerten Feedbacksuchverhalten zusammenhing, $b_1 = -0.21$, $F(1, 208.04) = 7.84$, $p = .006$, $\eta_p^2 = 0.04$, 95% CI [0.003, 0.098]. Anders als angenommen, wurde dieser Zusammenhang nicht durch Valenz, between-subjects: $F(1, 207.90) = 0.01$, $p = .939$, within-subjects: $F(1, 154.81) = 0.19$, $p = .665$, oder Inkongruenz, between-subjects: $F(1, 142.66) = 0.00$, $p = .995$, within-subjects: $F(1, 208) = 1.67$, $p = .198$, moderiert.

Diskussion: Die Studien konnten zeigen, dass der Schweregrad depressiver Symptome positiv mit der Inkongruenz zwischen Selbst- und Metawahrnehmung und negativ mit dem Feedbacksuchverhalten zusammenhängt. Inkongruenz und Valenz konnten den Zusammenhang zwischen dem Schweregrad depressiver Symptome und dem Feedbacksuchverhalten nicht erklären. Dies ist inkonsistent zu bisherigen Studien, nach welchen depressive Symptome mit dem Aufsuchen von negativem Feedback zusammenhängen. Eine Erklärung dafür könnten die Unterschiede in der Operationalisierung sein. Zum einen wurde in der vorliegenden Arbeit Feedbacksuchverhalten als hypothetisches Konstrukt operationalisiert während in vorherigen

Studien das tatsächliche Verhalten untersucht wurde. Zum anderen mussten die Teilnehmenden in vorherigen Studien Feedback einholen und konnten sich dabei zwischen positivem und negativem Feedback entscheiden, während die Teilnehmenden in der vorliegenden Arbeit nicht zwischen verschiedenen Optionen entscheiden mussten und auch die Möglichkeit hatten, sich gar kein Feedback zu wünschen. Insgesamt konnte im Rahmen der Studien nicht geklärt werden, welche Mechanismen dem Zusammenhang zwischen dem Schweregrad depressiver Symptome und Feedbacksuchverhalten zugrunde liegen.

5. Diskussion und Ausblick

Aufbauend auf dem kognitiven Modell von Beck (1970, 1974), wurde zur Erklärung depressiver Störungen in den letzten Jahren ein starker Fokus auf die Rolle der erschwerten Veränderung von dysfunktionalen Erwartungen gelegt sowie auf Mechanismen, die die Erwartungsveränderung hemmen beziehungsweise fördern (Everaert et al., 2018; Kube, Rief et al., 2019; Liknaitzky et al., 2017). Das Ziel des vorliegenden Dissertationsvorhabens bestand darin, die Erforschung potenziell relevanter Mechanismen weiter fortzusetzen. Dabei wurde eine ganzheitliche Sichtweise eingenommen, indem neben dem bereits gut erforschten Konstrukt der kognitiven Immunisierung, welches die ebenfalls bereits umfassend untersuchte kognitive Ebene repräsentiert, auch affektive Mechanismen (State Affekt und Affektregulation) sowie der verhaltensbezogene Mechanismus des Feedbacksuchverhaltens miteinbezogen wurden. Weiterhin wurde mit Bezug zu Rief und Joormann (2019) der Zusammenhang zwischen der Diagnose (episodische versus persistierende depressive Störung) und der Erwartungsveränderung untersucht. Das Ziel des Dissertationsvorhabens wurde im Rahmen von fünf wissenschaftlichen Artikeln realisiert.

Das Ziel der Artikel 1 - 3 bestand darin, ein ökologisch valides experimentelles Paradigma zur Untersuchung des Einflusses von kognitiver Immunisierung auf die Erwartungsveränderung bei Menschen mit depressiver Störung zu entwickeln (Artikel 1) und in einer großen klinischen Stichprobe anzuwenden (Artikel 2 und 3). Dabei sollten Unterschiede zwischen Menschen mit episodischer und Menschen mit persistierender depressiver Störung untersucht werden (Artikel 3). Die Ergebnisse zeigten, dass die Therapieerwartungen sowie die Erwartungen an positive und negative Lebensereignisse durch das Anschauen von positiven Therapieerfahrungsberichten signifikant verbessert wurden. Im Gegensatz zu vorausgegangenen Arbeiten (Kube, Rief et al., 2019) konnte der Einfluss von kognitiver Immunisierung auf die Erwartungsveränderung jedoch nicht eindeutig nachgewiesen werden (Artikel 2). Dieses Ergebnis kann,

wie in Kapitel 5.1 beschrieben, methodische Ursachen haben, weswegen nur eingeschränkt robuste Schlussfolgerungen aus den Ergebnissen gezogen werden können. Explorative Analysen zeigten ein interessantes Teilergebnis bezüglich geschlechtsspezifischer Unterschiede, da die Manipulation der kognitiven Immunisierung bei Männern, aber nicht bei Frauen, wirkungsvoll war. Dies entspricht dem Befund, dass Männer eine stärkere Tendenz zur Reaktanz aufweisen als Frauen (Kube et al., 2024; McCright & Dunlap, 2011; Wullenkord & Reese, 2021).

Es konnte außerdem gezeigt werden, dass Menschen mit persistierender depressiver Störung ihre Therapierwartungen weniger stark in positive Richtung anpassten als Menschen mit episodischer depressiver Störung. Dabei führte die Förderung von kognitiver Immunisierung zu besonders großen Unterschieden in der Erwartungsveränderung zwischen den beiden Patient*innengruppen (Artikel 3). Der Einfluss von kognitiver Immunisierung konnte trotzdem nicht eindeutig nachgewiesen werden, da sich die beiden Patient*innengruppen nicht signifikant in ihren Werten in der kognitiven Immunisierung unterschieden. Insgesamt reiht sich das Ergebnis der Studie in bisherige Befunde ein, die Unterschiede in der Psychopathologie zwischen persistierender und episodischer depressiver Störung nahelegen (Brockmeyer et al., 2015; Riso et al., 2003; van Randenborgh et al., 2012) und passt zu der von Rief und Joormann (2019) aufgestellten Hypothese, dass Menschen mit persistierender depressiver Störung größere Probleme mit der Erwartungsveränderung in Reaktion auf positive Informationen aufweisen als Menschen mit episodischer depressiver Störung. Anders als von Rief und Joormann (2019) angenommen, konnte jedoch nicht eindeutig nachgewiesen werden, dass Unterschiede in der kognitiven Immunisierung die Unterschiede in der Erwartungsveränderung zwischen Menschen mit persistierender und Menschen mit episodischer depressiver Störung erklären.

In Artikel 4 sollte der Einfluss von affektiven Mechanismen auf die Veränderung von Leistungserwartungen bei Menschen mit depressiver Störung untersucht werden. Anders als in den Hypothesen angenommen und entgegen der Vorbefunde (Kube et al., 2023) hatte

State Affekt keinen Einfluss auf die Erwartungsveränderung. Auch Affektregulation hing nicht mit der Erwartungsveränderung zusammen. Auf einem explorativen Level zeigten sich Hinweise darauf, dass der Einfluss von State Affekt von den Baseline-Erwartungen abzuhängen schien, da ein nicht-signifikanter Trend darauf hinwies, dass Personen, die positive Ausgangserwartungen hatten, ihre Erwartungen nach negativem Feedback stärker in negative Richtung veränderten, wenn bei ihnen zuvor Traurigkeit (versus Heiterkeit) induziert wurde. Das passt zu dem Befund von Karnick et al. (2024), dass Traurigkeit einen negativen Einfluss auf den Optimismus-Bias hat, Menschen unter Traurigkeit also eher dazu bereit sind, negative Informationen zu integrieren. Weiterhin wiesen die deskriptiven Daten darauf hin, dass dysfunktionale Affektregulation bei traurigen, aber nicht bei heiteren Teilnehmenden mit Auffälligkeiten in der Erwartungsveränderung zusammenhing, was konsistent zu bisherigen Studien ist, die einen Zusammenhang zwischen Auffälligkeiten in der Affektregulation und kognitiven Verzerrungen bei Menschen mit depressiven Störungen beziehungsweise Symptomen zeigen (Everaert et al., 2020; Gross, 2002; Joormann & Stanton, 2016).

Abschließend konnte Artikel 5 Aufschluss darüber geben, ob der Schweregrad depressiver Symptome mit dem Feedbacksuchverhalten zusammenhängt. Mit Hilfe von zwei Studien wurde hier in Einklang mit einer Studie von Beck et al. (2001) zunächst nachgewiesen, dass der Schweregrad depressiver Symptome positiv mit der Inkongruenz zwischen der Selbstwahrnehmung und der erwarteten Fremdwahrnehmung (Metawahrnehmung) zusammenhängt. Dass depressive Symptome mit einer negativen Selbstwahrnehmung assoziiert sind, passt zu einer Studie, die zeigt, dass depressive Störungen mit verstärkter Selbstkritik zusammenhängen (Ehret et al., 2015). In Studie 2 konnte dann zusätzlich gezeigt werden, dass das Feedbacksuchverhalten mit steigendem Schweregrad depressiver Symptome abnimmt. Anders als in den Hypothesen angenommen, betraf dies aber nicht nur positives, sondern auch negatives Feedback. Dies widerspricht bisherigen Studien, die einen Zusammenhang zwischen depressiven

Symptomen und einem verstärkten Aufsuchen von negativem Feedback nachweisen konnten (Wakeling et al., 2020). Entgegen bisheriger Befunde (Giesler et al., 1996; Jonas et al., 2001; Leary, 2007; Meppelink et al., 2019; Wakeling et al., 2020; Westerwick et al., 2017) moderierten weder Inkongruenz zwischen Selbst- und Metawahrnehmung noch Valenz den Zusammenhang zwischen dem Schweregrad depressiver Symptome und dem Feedbacksuchverhalten. Die vorliegenden Arbeit lieferte somit keine Bestätigung für die Theorien der *self-consistency* (Swann, 2012) und des *self-enhancement* (Kwang & Swann, 2010).

Zusammengefasst konnten die Hypothesen des vorliegenden Dissertationsvorhabens nur teilweise bestätigt werden. Es finden sich aber insgesamt Hinweise darauf, dass neben den gut erforschten kognitiven Mechanismen, affektive und verhaltensbezogene Mechanismen die eingeschränkte Erwartungsveränderung bei Menschen mit depressiven Störungen und Symptomen erklären können (s. Abbildung 3). Die Nicht-Signifikanz der Teilergebnisse können sich teilweise durch methodische Einschränkungen erklären lassen (s. Kapitel 5.1). Eine Verbesserung dieser Einschränkungen kann in zukünftigen Studien dazu beitragen, robustere Schlussfolgerungen bezüglich der in diesem Dissertationsvorhaben untersuchten Mechanismen zu ziehen (s. Kapitel 5.2).

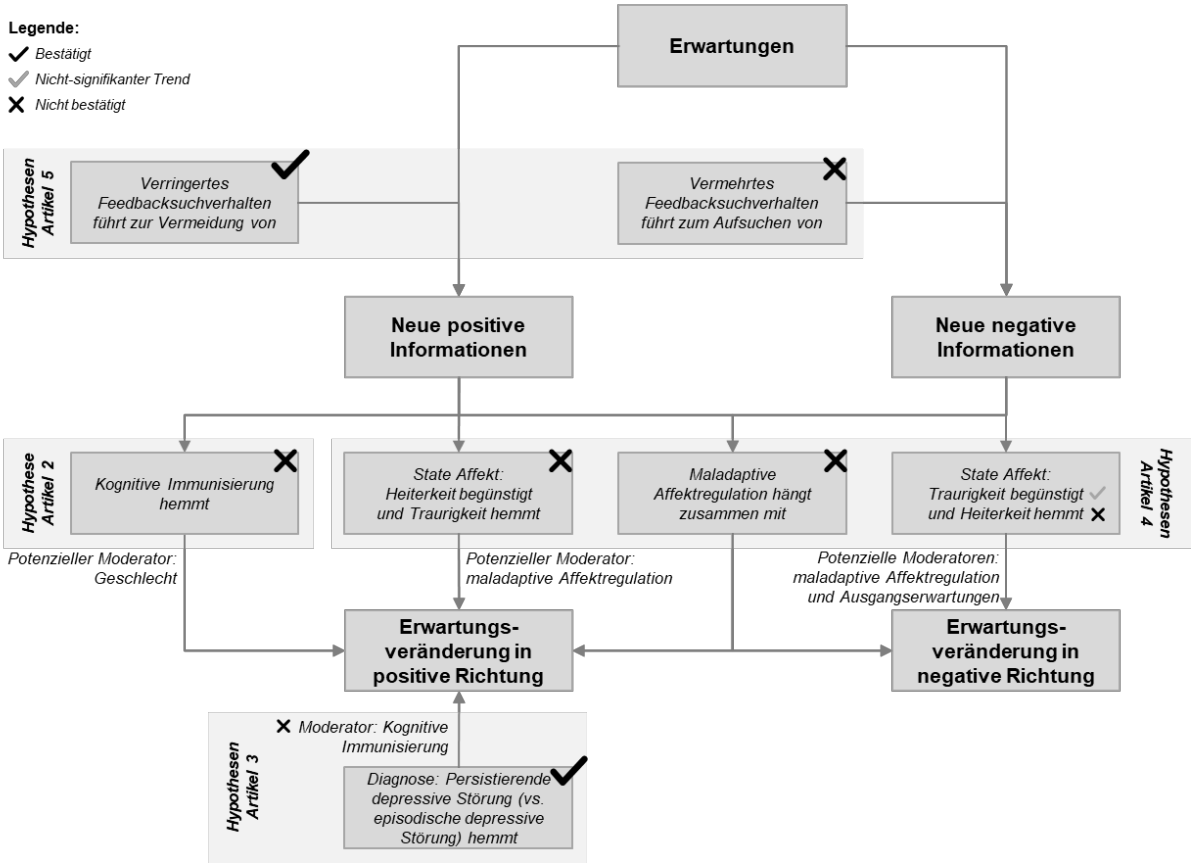


Abbildung 4. Zusammenfassende Darstellung der Ergebnisse

Anmerkung. Da in Artikel 1 keine inferenzstatistische Hypothesentestung stattfand, sind die Ergebnisse von Artikel 1 nicht in der Abbildung dargestellt.

5.1 Stärken und Einschränkungen

Mit Ausnahme von Artikel 1 wurden bei allen Studien die Hypothesen, das methodische Vorgehen und die statistischen Analysen präregistriert. Für Artikel 1 - 4 wurden klinische Stichproben verwendet, welche abgesehen von Artikel 1 aufwändig unter dem Einsatz von strukturierten klinischen Interviews diagnostiziert wurden. Für Artikel 1 - 3 wurde ein neues experimentelles Paradigma mit einem starken Fokus auf die externe Validität entwickelt und erfolgreich angewendet. Neben dem Fokus auf der externen Validität liegt eine weitere Stärke des Paradigmas darin, dass neben der kognitiven Immunisierung noch weitere kognitive Faktoren mitberücksichtigt wurden. In Artikel 3 wurden erstmals systematisch die Unterschiede zwischen Menschen mit persistierender und Menschen mit episodischer depressiver Störung in der Erwartungsveränderung untersucht. In Artikel 4 wurde erstmals systematisch untersucht,

welchen Effekt Heiterkeit versus Traurigkeit auf die Integration von positivem versus negativem Feedback bei Menschen mit depressiver Störung hat. Dabei wurde eine modifizierte Version des gut etablierten „Experimental Paradigm to investigate Expectation Change (EXPEC; Kube, Rief et al., 2018) eingesetzt. In Artikel 5 konnten, ebenfalls unter Anwendung einer modifizierten Version eines gut etablierten Studienprotokolls (Kelly & Sharot, 2021), neue Erkenntnisse bezüglich des Zusammenhangs zwischen dem Schweregrad depressiver Symptome und der Inkongruenz zwischen Selbst- und Metawahrnehmung sowie dem Feedbacksuchverhalten gewonnen werden. Neben diesen Stärken sind die folgenden Einschränkungen zu benennen:

In Artikel 1 wurde eine sehr kleine Stichprobe genutzt, weswegen weder inferenzstatistische Analysen noch eine ausreichende Einschätzung der psychometrischen Eigenschaften der Messinstrumente möglich waren. In den Artikeln 1 - 3 sollte kognitive Immunisierung experimentell gefördert versus gehemmt werden, indem sich die Teilnehmenden auf Unterschiede versus Gemeinsamkeiten zwischen sich selbst und den Personen, die positiv über die Ergebnisse ihrer Psychotherapie sprechen, fokussieren sollten. Diese Manipulation hat in keinem der Artikel zu signifikanten Unterschieden in der kognitiven Immunisierung geführt, was daran liegen kann, dass die Manipulation nicht ausreichend stark war oder dass die Skala nicht gut geeignet war, um kognitive Immunisierung zu messen. Für eine unzureichende Validität der Skala spricht das Teilergebnis aus Artikel 3, bei welchem die Manipulation von kognitiver Immunisierung zu Unterschieden in der Erwartungsveränderung, aber nicht zu Unterschieden in der kognitiven Immunisierung zwischen Menschen mit episodischer und Menschen mit persistierender depressiver Störung geführt hat. Dieses Ergebnis könnte aber auch dadurch zu Stande gekommen sein, dass ein anderer, nicht erfasster Mechanismus durch die Manipulation gefördert wurde. Eine weitere Einschränkung besteht darin, dass die Behandlungsvorgeschichte der Teilnehmenden nicht systematisch erfasst wurde. Dies wäre vor allem mit Hinblick auf die

Teilnehmenden mit einer langen Krankheitsgeschichte, wie zum Beispiel Teilnehmende mit rezidivierender oder persistierender depressiver Störung relevant gewesen, da davon auszugehen ist, dass die Behandlungserwartungen sowie das Ausmaß deren Veränderung durch frühere Therapieerfahrungen mitbeeinflusst wurden.

Mit Hinblick auf Artikel 4 besteht eine wesentliche Einschränkung in der relativ kleinen Stichprobe und in diesem Zusammenhang in einer limitierten statistischen Power in Kombination mit einem komplexen Studiendesign, weswegen methodische Probleme wie beispielsweise sich maskierende Effekte oder Reihenfolgeeffekte nicht ausgeschlossen werden können. Beispielsweise ist es möglich, dass die Ausgangserwartungen einen stärkeren Einfluss auf die Erwartungsveränderung hatten als das positive versus negative Feedback. Eine weitere Einschränkung besteht darin, dass die Daten zwar nahelegen, dass die experimentelle Manipulation des State Affekts zwar erfolgreich war, jedoch nur kurz anhielt und zu dem Zeitpunkt, zu dem das Leistungsfeedback gegeben wurde, nicht mehr wirksam war.

Eine gemeinsame Einschränkung der Artikel 1 - 4 liegt darin, dass keine gesunde Kontrollgruppe mit einbezogen wurde. Auf Grund der guten Studienlage bezüglich der Unterschiede zwischen Menschen mit und Menschen ohne depressive Störung in der Erwartungsveränderung wurde bei den Studien auf den erneuten Einsatz einer gesunden Kontrollgruppe verzichtet. Dennoch ist kritisch anzumerken, dass dadurch keine Aussage darüber möglich ist, welche (Teil-)Ergebnisse spezifisch auf das Vorliegen einer depressiven Störung zurückzuführen sind.

Hinsichtlich Artikel 5 ist kritisch zu benennen, dass nur das hypothetische und nicht das tatsächliche Feedbacksuchverhalten untersucht wurde, was einen Vergleich mit Vorstudien (Wakeling et al., 2020) beeinträchtigt. Weiterhin wurde bei dieser Studie keine klinische Stichprobe verwendet, sondern es wurden lediglich depressive Symptome im Selbstbericht erfasst. Der Artikel konnte, anders als geplant, keinen Aufschluss darüber geben, welche Mechanismen

dem Zusammenhang zwischen dem Schweregrad depressiver Symptome und dem Feedbacksuchverhalten zugrunde liegen. Ein möglicher Grund dafür kann im Studiendesign begründet sein, in welchem Inkongruenz und Valenz des Feedbacks nicht experimentell manipuliert, sondern aus den Antworten der Teilnehmenden heraus berechnet wurden. Es ist nicht auszuschließen, dass die Abweichung zwischen Selbst- und Metawahrnehmung insgesamt nicht groß genug war, um eine ausreichend starke Inkongruenz und Valenz herzustellen. Weiterhin wurden keine weiteren Kontrollvariablen erhoben, welche mit depressiven Symptomen assoziiert sind und den Zusammenhang zwischen dem Schweregrad depressiver Symptome und den Auffälligkeiten im Feedbacksuchverhalten erklären können. Darunter fallen unter anderem Ängstlichkeit (Reynolds et al., 2024), Anhedonie (Pizzagalli, 2014) und Vermeidungsverhalten (Brockmeyer et al., 2015; Trew, 2011).

5.2 Implikationen für zukünftige Forschung

Aus den Ergebnissen und Limitationen der Studien lassen sich die folgenden Implikationen für die zukünftige Forschung ableiten:

5.2.1 Kognitive Immunisierung

Der Einfluss von kognitiver Immunisierung auf die Erwartungsveränderung bei Menschen mit depressiver Störung konnte im Rahmen dieses Dissertationsvorhabens nicht nachgewiesen werden. Dies kann darin begründet sein, dass die Manipulation von kognitiver Immunisierung, welche darin bestand, dass sich die Teilnehmenden auf Unterschiede (Immunisierungsförderung) beziehungsweise auf Gemeinsamkeiten (Immunisierungshemmung) konzentrieren sollten, keinen direkten Einfluss auf die Stärke der kognitiven Immunisierung hatte. Zukünftige Studien könnten die experimentelle Manipulation modifizieren, indem beispielsweise der subjektive Nutzen der Erfahrungsberichte manipuliert wird. Beispielsweise könnte man die Teilnehmenden darüber informieren, inwiefern ihre eigene Psychotherapie der Therapie, die die Personen in den Videos erhalten haben, ähneln wird, um den informativen Nutzen der

Videos für die Teilnehmenden zu erhöhen versus zu senken. Dass die Manipulation des subjektiven Nutzens geeigneter zur Modulation von kognitiver Immunisierung sein könnte, legt eine Studie von Kube, Glombiewski et al. (2019) nahe, in welcher verschiedene Strategien zur Hemmung von kognitiver Immunisierung miteinander verglichen wurden.

Weiterhin legen die Ergebnisse aus Artikel 2 nahe, dass es relevante geschlechterspezifische Unterschiede in der kognitiven Immunisierung gibt, da die Manipulation für Männer, aber nicht für Frauen, wirkungsvoll war. Für zukünftige Studien ergeben sich dabei zwei Implikationen: Erstens zeigten drei der vier Erfahrungsberichte Frauen, was eine unbeabsichtigte zusätzliche Förderung der kognitiven Immunisierung bei Männern bedingt haben kann. Das Paradigma kann entsprechend abgewandelt werden, indem das Verhältnis von Männern und Frauen in den Erfahrungsberichten ausgeglichen wird. Zweitens lässt sich aus der aktuellen Studienlage ableiten, dass das männliche Geschlecht mit einer stärkeren Neigung zur Reaktanz zusammenhängt (Kube et al., 2024; McCright & Dunlap, 2011; Wullenkord & Reese, 2021), was wiederum die geschlechtsspezifische Unterschiede in der kognitiven Immunisierung erklären und somit in zukünftigen Studien mitberücksichtigt werden kann.

5.2.2 Unterschiede zwischen episodischer und persistierender depressiver Störung

Im Rahmen von Artikel 3 konnte nachgewiesen werden, dass Menschen mit persistierender depressiver Störung ihre Erwartungen weniger stark in positive Richtung anpassen als Menschen mit episodischer depressiver Störung. Die Frage nach den zugrundeliegenden Mechanismen konnte jedoch nicht beantwortet werden, da nicht eindeutig nachgewiesen werden konnte, dass kognitive Immunisierung die Unterschiede erklärt. Dies könnte an der Validität der Skala liegen. Für zukünftige Forschung kann es somit bedeutsam sein, die Skala hinsichtlich ihrer psychometrischen Eigenschaften zu überprüfen und sie gegebenenfalls zu modifizieren. Weiterhin kann es sinnvoll sein, andere potenziell zugrundeliegende Mechanismen miteinzubeziehen wie negativen Affekt (Kube et al., 2023) oder Aufmerksamkeitsbias (Everaert et al.,

2014; Keller et al., 2019). Die Ergebnisse der Studie legen weiterhin nahe, dass Menschen mit persistierender depressiver Störung weniger positive Ausgangserwartungen hatten als Menschen mit episodischer depressiver Störung. Es ist naheliegend, dass sich dies durch die Unterschiede in der Behandlungsgeschichte erklären lässt. Daher könnte es für zukünftige Studien hilfreich sein, explizit Daten zu beispielsweise vorherigen Therapien zu erheben und zu untersuchen, wie sich bisherige Behandlungserfahrungen auf die Erwartungsveränderung auswirken. Auch Unterschiede in den Vulnerabilitätsfaktoren und der Krankheitsgeschichte können ein relevanter Faktor sein, der in zukünftigen Studien mit bedacht werden kann: so hängen persistierende depressive Störungen häufig mit Erfahrungen von Kindesmisshandlung in der Biografie zusammen (Brakemeier et al., 2018), was wiederum mit eingeschränkten sozialen Kognitionen sowie stärkeren interpersonellen Problemen zusammenhängt (Struck et al., 2020). Weiterhin gehen persistierende depressive Störungen häufig mit einem jüngeren Ersterkrankungsalter einher („early-onset“; Agosti, 1999; Brockmeyer et al., 2015; Lizardi et al., 1995), was wiederum mit früher etablierten und rigideren kognitiven Schemata und somit auch mit änderungsresistenteren Erwartungen zusammenhängen kann. Weiterhin kann in zukünftigen Studien untersucht werden, ob sich Menschen mit persistierender und episodischer depressiver Störung auch in der Erwartungsveränderung bezüglich anderer Lebensbereiche voneinander unterscheiden. So wird beispielsweise ein besonders starker Zusammenhang zwischen dysfunktionalen interpersonellen Erwartungen und der persistierenden depressiven Störung angenommen (Kirchner et al., 2025).

5.2.3 State Affekt und Affektregulation

Im Rahmen von Artikel 4 konnte nicht eindeutig nachgewiesen werden, dass State Affekt und Affektregulation mit der Erwartungsveränderung bei Menschen mit depressiver Störung zusammenhängen. Anregungen für zukünftige Forschung lassen sich vor allem aus den explorativen Analysen ableiten, die darauf hinweisen, dass die Ausgangserwartungen die

Erwartungsveränderung beeinflussen. Dies passt wiederum zu den Befunden aus Artikel 3, dass sich Menschen mit persistierender und Menschen mit episodischer depressiver Störung nicht nur in der Erwartungsveränderung, sondern auch in ihren Ausgangserwartungen voneinander unterscheiden. Weiterhin gab es in den Daten Hinweise darauf, dass Traurigkeit den Zusammenhang zwischen den Ausgangserwartungen und der Erwartungsveränderung verstärkt, was in zukünftigen Studien gezielt untersucht werden kann. Bei weiterer Verwendung des Paradigmas sollte über eine Veränderung der Methode zur Affektinduktion nachgedacht werden, da die Daten darauf hinwiesen, dass die Affektinduktion durch die Videoclips zu kurzweilig war.

Bezüglich der Affektregulation gab es in den Daten Hinweise darauf, dass Rumination, Suppression und Dampening mit Auffälligkeiten in der Erwartungsveränderung zusammenhingen, jedoch nur bei Personen bei denen Traurigkeit induziert wurde. Es kann sich somit lohnen, in zukünftigen Studien systematisch zu untersuchen, ob sich maladaptive Affektregulation und Traurigkeit in ihrem Einfluss auf die Erwartungsveränderung gegenseitig verstärken. Dies würde einem theoretischen Ansatz von Kube (2023) entsprechen, in welchem angenommen wird, dass maladaptive Affektregulation zu verstärktem negativem Affekt und dies wiederum zu einer reduzierten Fähigkeit, positive Informationen zu integrieren, führt.

5.2.4 Feedbacksuchverhalten

Im Rahmen von Artikel 5 konnte nachgewiesen werden, dass der Schweregrad depressiver Symptome positiv mit der Inkongruenz zwischen Selbst- und Metawahrnehmung und negativ mit dem Feedbacksuchverhalten zusammenhängt. Die Frage nach den zugrundliegenden Mechanismen konnte nicht geklärt werden, da weder Valenz noch Inkongruenz den Zusammenhang zwischen dem Schweregrad depressiver Symptome und dem Feedbacksuchverhalten erklären konnten. Entsprechend leitet sich für zukünftige Forschung ab, potenziell zugrundeliegende Mechanismen weiter zu untersuchen. Relevante Fragestellungen könnten in diesem Zusammenhang sein, welche Motive für Feedbacksuchverhalten (z.B. Verbesserung der

Stimmung) durch das Vorhandensein von depressiven Symptomen an Bedeutsamkeit verlieren und dadurch das Interesse an Feedback verringern. Auch der Einfluss von Variablen auf das Feedbacksuchverhalten, die explizit mit depressiven Störungen zusammenhängen, wie beispielsweise Ängstlichkeit, Anhedonie oder Vermeidungsverhalten, könnte in zukünftigen Studien untersucht werden. Weiterhin könnte untersucht werden, ob das hypothetische Feedbacksuchverhalten, wie es in der vorliegenden Arbeit operationalisiert wurde, mit dem tatsächlichen Feedbacksuchverhalten zusammenhängt. Dadurch könnten möglicherweise auch die Diskrepanzen zwischen den Ergebnissen der vorliegenden Arbeit und den Ergebnissen aus vorherigen Studien aufgeklärt werden. Abschließend kann es sich lohnen, die Studie mit einer klinischen Stichprobe von Menschen mit depressiver Störung zu replizieren, um robuste Schlossfolgerungen über den Zusammenhang zwischen depressiven Störungen und dem Feedbacksuchverhalten zu ziehen.

5.3 Praktische Implikationen

Aus den Artikeln, die diesem Dissertationsvorhaben zugrunde liegen, lassen sich die folgenden praktischen Implikationen ableiten:

Erstens lässt sich aus den Ergebnissen der Artikel 2 und 3 ableiten, dass es für Menschen mit depressiver Störung hilfreich sein kann, wenn man ihnen vor oder zu Beginn ihrer Psychotherapie positive Erfahrungsberichte von anderen Betroffenen zeigt. Es ist dabei jedoch zu beachten, dass in der zugrundeliegenden Stichprobe vor allem negative Erwartungen reduziert werden konnten, was nicht automatisch bedeutet, dass positive Erwartungen aufgebaut werden. Vorherige Studien legen nahe, dass der Aufbau positiver Erwartungen einer zusätzlichen Intervention bedarf, wie das Trainieren von optimistischen Erwartungen (Miranda et al., 2017) oder die Visualisierung positiver Erlebnisse (Kube, Glombiewski et al., 2019).

Zweitens lässt sich aus den Ergebnissen von Artikel 3 ableiten, dass es bei Patient*innen mit persistierender depressiver Störung von zusätzlicher Bedeutung ist,

Behandlungserwartungen, aber auch andere störungsrelevante Erwartungen in der Psychotherapie aufzugreifen. Psychotherapeut*innen sollten sich hier besonders bemühen, durch ihr Verhalten und ihr therapeutisches Vorgehen, die Erwartungen zu verbessern. Wärme und Kompetenz sind dabei zwei Faktoren, welche sich als relevante Variablen in der Veränderung von Behandlungserwartungen herausgestellt haben (Seewald & Rief, 2023, 2024). Gleichzeitig kann es in der Behandlung besonders hilfreich sein, sich als Therapeut*in selbst mehr auf einer persönlichen Ebene einzubringen und einen besonderen Fokus auf die therapeutische Beziehung zu legen, wie es im „Cognitive and Behavioral Analysis System of Psychotherapy“ (CBASP; McCullough, 2003) praktiziert wird.

Drittens lässt sich aus den Ergebnissen von Artikel 5 ableiten, dass Menschen mit depressiven Symptomen Situationen, in denen ihre (negativen) Überzeugungen korrigiert werden könnten, weniger aufsuchen als Menschen ohne depressive Symptome. Dies ist konsistent mit theoretischen Erklärungsansätzen zu depressiven Störungen, in welchen betont wird, dass das Fehlen von neuen erwartungsinkongruenten (positiven) Informationen ein wichtiger Faktor für die Entstehung und Aufrechterhaltung depressiver Störungen ist (Barrett et al., 2016; Kube et al., 2020). Für die Praxis bedeutet das, dass Menschen mit depressiven Symptomen besonders dazu angeregt werden sollten, erwartungsverletzende Situationen, beispielsweise durch das Einholen von Feedback, aufzusuchen. Dabei ist jedoch zu beachten, dass eine neue Information (z.B. positives Feedback) nicht automatisch dazu führt, dass dieses Feedback in das Selbstbild aufgenommen wird (Kube, 2023). Das zeigt sich auch in den Ergebnissen von Studie 5, welche belegen, dass Menschen mit depressiven Symptomen davon ausgehen, dass andere Menschen sie positiver und weniger negativ wahrnehmen als sie sich selbst und dennoch eine negative Selbstwahrnehmung haben. Als Behandler*in ist es somit zentral, Faktoren, die diese Integration erschweren zu identifizieren und zu adressieren (Rief & Glombiewski, 2016; Wilhelm et al., 2022).

5.4 Fazit

Ziel dieses Dissertationsvorhabens und der fünf zugrundeliegenden Artikel war es, besser zu verstehen, welche Mechanismen die Erwartungsveränderung bei Menschen mit depressiven Störungen und Symptomen hemmen versus fördern können. Im Rahmen des Dissertationsvorhabens konnte ein neues, extern valides experimentelles Paradigma etabliert werden, in welchem Patient*innen positive Erfahrungsberichte von Psychotherapie gezeigt werden. Es konnte gezeigt werden, dass sich diese Erfahrungsberichte dazu eignen, die Erwartungen bezüglich zukünftiger Lebensereignisse und der Psychotherapie zu verbessern. Anders als angenommen, konnte jedoch nicht eindeutig nachgewiesen werden, dass die Förderung versus Hemmung von kognitiver Immunisierung zu Unterschieden in der Erwartungsveränderung führt. Es gab dabei jedoch Hinweise auf geschlechterspezifische Unterschiede, da sich die experimentelle Manipulation von kognitiver Immunisierung bei Männern, aber nicht bei Frauen, als wirksamer erwies. Weiterhin konnte gezeigt werden, dass Menschen mit persistierender depressiver Störung im Vergleich zu Menschen mit episodischer depressiver Störung sowohl niedrigere Ausgangserwartungen als auch veränderungsresistentere Therapieerwartungen haben. Es konnte, wie in vorherigen Studien, weiterhin gezeigt werden, dass Menschen mit depressiver Störung ihre Erwartungen stärker in Reaktion auf negative als in Reaktion auf positive Informationen verändern. Anders als angenommen, zeigte sich kein Zusammenhang zwischen State Affekt und Affektregulation und der Erwartungsveränderung. Es gab jedoch Hinweise darauf, dass der Einfluss von State Affekt von den Ausgangserwartungen und der Einfluss von Affektregulation vom State Affekt abhängig ist. Weiterhin konnte gezeigt werden, dass der Schweregrad depressiver Symptome mit einer Inkongruenz zwischen Selbst- und Metawahrnehmung sowie einem verringerten Feedbacksuchverhalten assoziiert sind. Die Frage nach den zugrundeliegenden Mechanismen zwischen diesem Zusammenhang konnte nicht geklärt werden. Aufbauend auf den Limitationen sowie den Befunden der Studien, lassen sich neue Fragestellungen

für zukünftige Forschungsarbeiten ableiten. Für die Praxis ergeben sich Anhaltspunkte hinsichtlich der Maßnahmen, mit welchen Erwartungen bei Patient*innen verbessert werden können (z.B. das Präsentieren positiver Erfahrungsberichte) sowie der Faktoren, welche für eine erfolgreiche Integration von positiven Erwartungen berücksichtigt werden müssen (z.B. Erkrankungsdauer und Ausgangserwartungen).

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Anhang A: Artikel 1

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RESEARCH PAPER

Learning from other patients — A feasibility study to establish an ecologically valid paradigm to modify negative expectations in depression through authentic psychotherapeutic treatment reports

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Abstract
Background: Patients' expectations about psychotherapy are of great importance, since they can influence the outcome of psychotherapy. Thus, it is important to ensure that patients have positive expectations about the outcomes of psychotherapy. This is particularly relevant in patients with major depression, since they often hold (unrealistically) negative expectations and tend to maintain these expectations despite novel positive information. Here, we test the feasibility of a novel, ecologically valid experimental paradigm to investigate how depressed patients learn from other patients' experiences with psychotherapy, and which cognitive mechanisms hinder the integration of novel positive information.
Method: N = 17 outpatients diagnosed with a major depressive disorder watched videotaped experience reports of five acting patients. Each acting patient was shown twice: first, before receiving psychotherapeutic treatment, where they reported on feeling depressed and pessimistic about their future; second, at the end of psychotherapy, where they reported on feeling better and having overcome the challenges they used to struggle with. Before and after watching the videos, participants rated their expectations for positive and negative future life events.

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Results: Results indicate that the paradigm is well applicable and the videos were perceived as credible, interesting and helpful. Descriptive results show that the video reports led to a slight modification of expectations.
Conclusion: The results indicate that our new paradigm is a suitable tool to investigate expectation change in response to other patients' experiences with psychotherapy. Furthermore, our paradigm is suitable to investigate potential cognitive mechanisms involved in expectation change in depression.

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Introduction

In the context of psychotherapy, patients' expectations about themselves, others or treatment are of great importance (Rief & Glombiewski, 2016). Crucially, many patients show biases in these expectations. As such, people with major depression have negative expectations for future events (Strunk et al., 2006; Strunk & Adler, 2009; Thimm et al., 2013) and such negative expectations are predictive of the course of depressive symptoms (Gopinath et al., 2007; Gordon et al., 2011; Ludman et al., 2003). More specifically, expectations can also influence the effects of psychotherapy, since depressed patients who expect therapy to be effective tend to engage more constructively in therapy sessions (Meyer et al., 2002) and show reduced symptom severity in the course of therapy (Meyer et al., 2002; Meyerhoff & Rohan, 2016). Therefore, it is important to make sure that patients have positive expectations about the outcomes of psychotherapy. However, this often proves to be challenging, because people with depressive disorders show a strong tendency to hold on to dysfunctional expectations despite positive, disconfirming experiences (Everaert et al., 2018; Kube et al., 2020; Kube, Rief, et al., 2019; Liknaitzky et al., 2017). Therefore, it is important to better understand the mechanisms that contribute to the maintenance of dysfunctional expectations.

Recent research has discussed cognitive immunization as one potential factor underlying the persistence of (dysfunctional) expectations in depression (Kube, Glombiewski, et al., 2019; Kube, Rief, et al., 2019). Cognitive immunization is regarded as a cognitive process in which an expectation-violating (positive) experience is devalued through defensive cognitive strategies. Specifically, according to the model of psychological responses to violations of expectations by Rief et al. (2015), there are two strategies through which disconfirmatory information can be devalued: a data-oriented strategy and a concept-oriented strategy. The data-oriented strategy refers to a reframing of the particular expectation-violating situation (e.g., ''It was an exception of the rule, that they were friendly to me."), while the concept-oriented reframing refers to the reframing of the concept salient in the situation (e.g., ''Just because someone is friendly, it doesn't necessarily mean that they are a nice person."; Panitz et al., 2021; Rief et al., 2015). With regard to depressive disorders, cognitive immunization has been investigated experimentally (Kube, Glombiewski, et al., 2019; Kube & Glombiewski, 2021; Kube, Rief, et al., 2019). This line of research has shown that promoting the engagement in cognitive immunization strategies hinders the revision of negative performance expectations in response to positive performance feedback, whereas the inhibition of cognitive immunization enhanced expectation change (Kube, Glombiewski, et al., 2019; Kube, Rief, et al., 2019).

To date, research on the influence of cognitive immunization on expectation change in depression is mainly tied to the specific context of performance expectations (see also Groth & Rief, 2022b), although a few recent studies examined the potential of other experimental approaches focusing on social rejection expectations (D'Astolfo et al., 2020; Groth & Rief, 2022a; Kube et al., 2022). For the reasons mentioned above, however, it would also be important to experimentally investigate whether and how reports of other patients' experiences can be used to modify one's own expectations in depression — and whether cognitive immunization hinders the integration of such positive information from other patients.

Existing experimental tasks put effort into a high internal validity, while their external validity, that is, their relevance for depressed people's everyday life might be limited due to their focus on highly controlled experimental procedures. In the present study, we sought to develop an experimental paradigm that has higher external validity by focusing on people's expectations for experiencing positive vs. negative everyday life events in their lives. We aimed to alter these expectations in depressed patients awaiting psychotherapeutic treatment by presenting them videotaped reports of former patients, who explain how their psychotherapeutic treatment helped them overcome the depressive disorder and experience more positive life events. We hypothesized that such positive reports from other patients would enhance participants' own expectations for experiencing positive life events following psychotherapeutic treatment. In addition, we aimed to supplement this experimental approach by adding a manipulation of cognitive immunization, aimed at modulating participants' appraisal of the relevance of the other patients' reports for their own lives. The purpose of the present study is to describe the development and preliminary validation of this new experimental paradigm in a small sample of patients with major depression. More specifically, we aimed to evaluate a) participants' adherence to study procedures (i.e., instructions), b) participants' feedback on the videotaped reports, c) the suitability of the outcome measures, d) the feasibility of the paradigm in terms of investigating the influence of cognitive immunization and other cognitive

factors (i.e., attention, interpretation, memory) on expectation change.

Method

The local ethics committee (reference number 190_2019) approved the study. All participants gave written informed consent. The data is shared on https://osf.io (Stadlmeier et al., 2022a).

Participants

We recruited participants from an university outpatient clinic. We recruited participants who met the criteria of an episodic or persistent depressive disorder (ICD-10: F32.0-F32.2, F33.0-F33.2, F34.1) as the primary diagnosis, according to a structured clinical interview (usually the German version of the Structured Clinical Interview for DSM (SCID; Beesdo-Baum et al., 2019) or the German „Diagnostisches Kurz-Interview bei psychischen Störungen'' (Mini-Dips; Margraf, 1994)), as determined by a psychotherapist in training under supervision of a licensed psychotherapist. Further inclusion criteria were that patients had to be still in the diagnostic phase prior to psychotherapeutic treatment or at the very beginning of psychotherapeutic treatment (usually a maximum of 5 sessions completed), at least 18 years old, and fluent in German. Exclusion criteria were: psychotic symptoms and bipolar affective disorder. Participants received financial compensation (10€) for their participation. We recruited N = 17 (11 female, 6 male) participants from May to July 2021. Their age ranged from 21 to 53 years (M = 33.5, SD = 11.39). For an overview of the sample characteristics, see Table 1.

General procedure

A graphical illustration of the experimental procedure is shown in Fig. 1. The study was conducted online via https://www.soscisurvey.de. The data collection took place at an individually scheduled appointment, which patients could complete at home while being in contact with the study assistant via telephone. After giving written informed consent, sociodemographic variables and baseline expectations of future life events were assessed.

This was followed by the first video of an alleged outpatient claiming to be at the beginning of treatment and describing depressive symptoms. Depending on the experimental condition, the video was preceded by the instruction to focus either on identified similarities (''cognitive immunization inhibition") or differences (''cognitive immunization promotion") between themselves and the person in the video or on the physical appearance of the person (''distraction"), as detailed below. In the control group, participants received no specific instruction. After watching the video, subjects followed the instruction to note their observations regarding similarities, dissimilarities, and the physical appearance, respectively, in an open text field. We required participants to note down their observations for two reasons: First, we wanted to check whether participants were actually following the instruction. Second, we assumed that writing down the observed similarities vs. dissimilarities would amplify the effect on the perceived value of the videotaped patients' reports for their own life situation. This was followed by a video of the same person at the end of their alleged therapy, who now reported about the improvements that they have experienced (for details of the videotaped reports, see below). Participants were asked to watch the videos carefully and to think about to what extent the descriptions in the video could be relevant for their own life situation. Subsequently, cognitive immunization, recall of the content and interpretation with regard to the videos were assessed. In future studies using the paradigm, assessment of recall and interpretation is supposed to serve as a manipulation check to verify that cognitive immunization and not selective recall or interpretation bias is manipulated by the experimental condition. This procedure was repeated five times, that is, with five different patients each being presented twice (at the beginning and the end of psychotherapy). The order of the five patients was randomized. After completing the videos and the corresponding instructions, expectations about future life events were measured a second time.

At the end, participants had the possibility to give written feedback about comprehension problems and general remarks. Finally, participants were debriefed about the aims of the paradigm and that the people in the videos were not actual patients. After completing the procedure, participants were asked about oral feedback. On average, it took participants 74.68 minutes (SD = 9.84, Md = 74.78, R = 59.63—97.1) to complete the study.

Stimuli

The videos showed a total of five different patients performed by volunteer amateur actors/actresses. Participants were informed that the persons in the videos were real outpatients and that the videos were especially filmed for research purposes. However, after completing the study participants were debriefed about the fact that the people in the videos were actors, as described below. When developing the roles for the characters, we tried to create them in such a way that they differed in terms of socio-demographic variables as well as the course and appearance of the depressive disorder. In doing so, we pursued two goals: First, we wanted to increase the likelihood that the participants would be able to identify with at least one of the characters. Second, it was important to us to represent depression in its heterogeneity as broadly as possible. Regarding the forms of depression, we tried to map the following subtypes: 1) anhedonia with diminished ability to concentrate, listlessness, feelings of worthlessness and suicidal ideation; 2) somatoform depression with headaches, muscle tension, insomnia and fatigue; 3) seasonal recurrent depression with listlessness, social withdrawal and disturbed eating behavior; 4) depression with melancholic features with loss of pleasure, inner emptiness, loss of libido, irritability and feelings of guilt; 5) chronic depression with loss of interest, psychomotor retardation and fatigue.

In the first video (beginning of treatment) the characters introduced themselves and described why they were seeking

Table 1 Sample characteristics.

Variable	
Age in years, *M (SD)*	34.24 (11.29)
Sex, *N (%)*	
Male	6 (35.29)
Female	11 (64.71)
First language, *N (%)*	
German	15 (88.24)
Other	2 (11.76)
Highest educational level, *N (%)*	
School student	1 (5.88)
School diploma	7 (41.18)
Qualification for university entrance	4 (23.52)
University diploma	3 (17.65)
Other	2 (11.76)
Employment status, *N (%)*	
In training	2 (11.76)
Student	1 (5.88)
Employee	8 (47.06)
Self-employed	1 (5.88)
Unemployed	2 (11.76)
Other	3 (17.65)
Diagnoses (ICD-10), *N (%)*	
Primary diagnosis	
Depressive episode	7 (41.18)
Recurrent depressive disorder	10 (58.82)
Secondary diagnosis	
Alcohol abuse	1 (5.88)
Social phobia	2 (11.76)
Panic disorder	1 (5.88)
Obsessive-compulsive disorder, predominantly obsessional thoughts or rumination	1 (5.88)
Eating disorder, unspecified	1 (5.88)
Tertiary diagnosis	
Chronic pain disorder with somatic and psychological factors	2 (11.76)
Emotionally unstable personality disorder, borderline	1 (5.88)
Stage of treatment[a]	
Diagnostic phase, *N (%)*	5 (27.78)
Beginning of psychotherapeutic treatment, *N (%)*, therapy sessions completed, *M (SD)*	11 (61.11), 4.36 (1.03)

Note. [a]Two missing data points.

treatment, their symptomatology and their impairments. They further indicated that they did not have high expectations about their recovery. The first video was implemented for two reasons: Firstly, this aimed to enable our participants, who likewise were at the beginning of the therapy, to identify themselves as strongly as possible with the characters. Secondly, it aimed to increase the plausibility of the development that the characters have made during their therapy. In the second video, the characters described how their quality of life and their well-being had improved during psychotherapy, what they perceived as helpful in the therapy, and in which areas of life they have made positive experiences, i.e., have experienced positive expectation violations. The length of the videos varied between 2:30 and 5:01 minutes (beginning of treatment), and between 2:07 and 4:10 minutes (end of treatment), respectively. The physical appearance, mimic and the body language of the characters differed between the two videos: In the first video they appeared more depressed and fatigued, e.g., they wore plain clothes, did not keep eye contact, and were slowed down or agitated, respectively, in their speaking and motions. In the second video, they seemed more energetic and cheerful, for example they wore more colorful clothes, showed more positive affectivity in their facial expressions or had a more neatly done hairstyle. All the characters were introduced with an age-appropriate name. A detailed description of the characters can be found in the supplementary material.

As deceiving participants entails ethical challenges, we carefully considered how to justify our deception about the people in the videos being actual patients. In our view, using actors instead of real patients provided the following main advantage: It was important to us that the characters shown in the videos differed in certain aspects (as described above), and the choice of actors helped us control for these aspects. As a result, we decided to use scripted experience reports. However, we made sure that the videos were as authentic as possible by including the

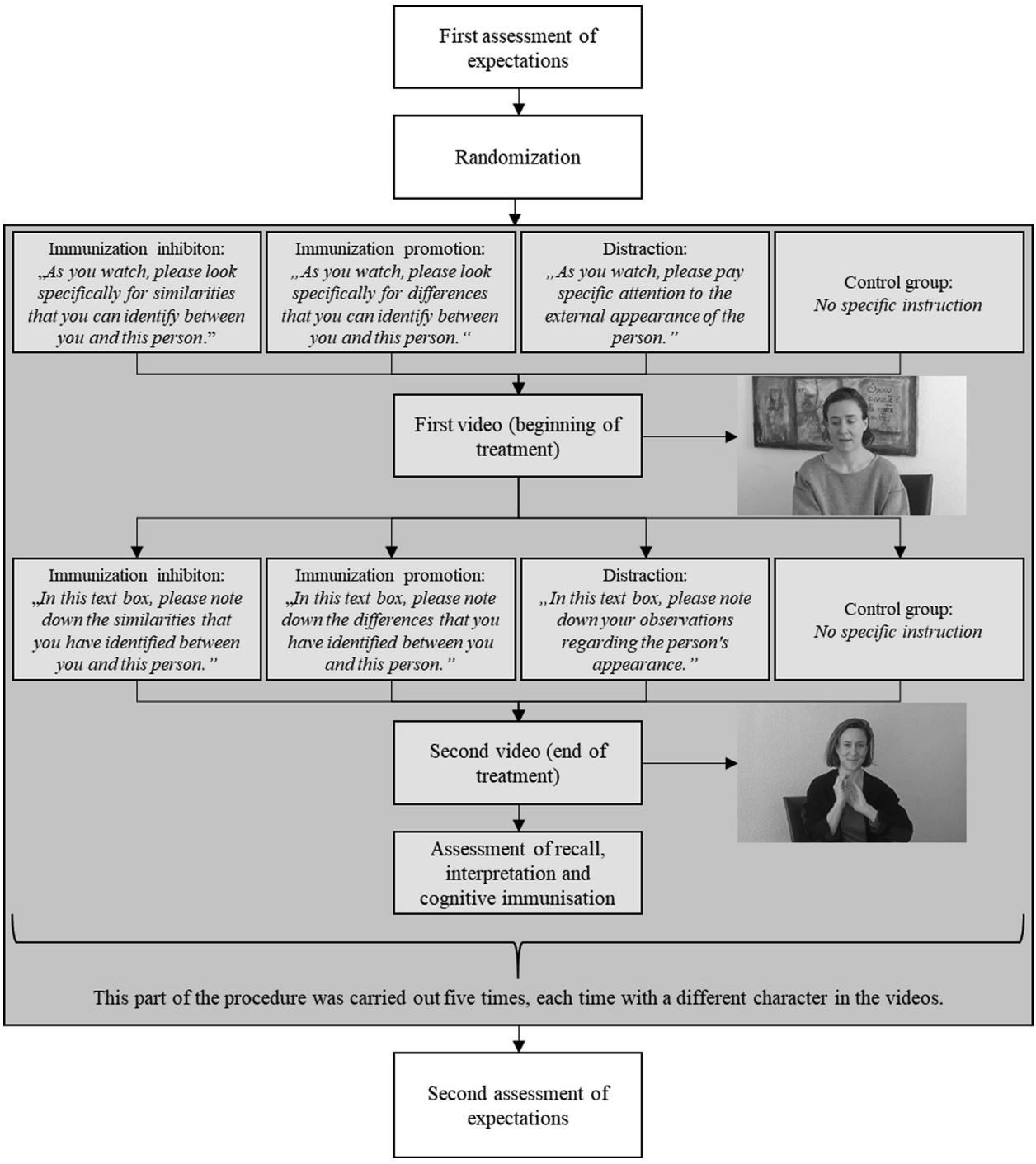


Fig. 1 General procedure.

experiences of many real patients in preparing the scripts. We decided to deceive participants about the authenticity of the characters at the beginning of the study for the following reason: If patients had known that the people in the videos were not actual patients, they could have questioned the relevance of the positive experiences from the videos. Accordingly, it would have been likely that all participants had engaged in some sort of cognitive immunization, not just those participants from the cognitive immunization-promoting condition.

Experimental conditions

Inhibition vs. Promotion of cognitive immunization

Participants from the cognitive immunization-promotion condition received the following instruction before watching each of the five videos from the patients at the beginning of their psychotherapy: ''As you watch, please look specifically for differences that you can identify between yourself and the person in the video." This instruction was supposed to enhance participants' engagement in cognitive

immunization because having the belief that the persons in the videos are quite different from oneself may ease the disregard of their experiences as not being relevant for one's own life situation. In other words, the manipulation was intended to promote data-oriented cognitive immunization by considering the information received from the other patients to be not comparable to one's life situation and thus irrelevant, e.g., by thinking, ''My life situation is very different from that person's life situation. Therefore, I do not believe that therapy will be just as successful for me." Hence, we expected that participants in the cognitive immunization-promotion condition made little use of the other patients' reports of positive developments in their lives after psychotherapeutic treatment, but largely retained their pessimistic beliefs about their future.

By contrast, participants from the cognitive immunization-inhibiting condition received the following instruction before watching each of the five videos: ''As you watch, please look specifically for similarities that you can identify between yourself and the person in the video." This instruction was supposed to inhibit the engagement in cognitive immunization as we reasoned that being aware of the similarities between the other patients and oneself would make it difficult for participants to disregard their experiences. Accordingly, we predicted that participants from the cognitive immunization-inhibiting condition would use the other patients' positive reports of improvements in their lives to update their own future expectations in a positive direction.

Distraction and no-manipulation control group

In the distraction condition, participants were instructed to pay attention to the physical appearance of the patients shown in the videos: ''As you watch, please pay attention to the physical appearance of the person. Try to remember the main aspects (e.g., hair color, hairstyle, clothes, color of clothes, jewelry, etc.). You will need these observations for a subsequent task." The distraction condition was implemented to verify that differences in expectation change resulted from the manipulation of cognitive immunization and not from a nonspecific interruption of the study procedure after the expectation violation. Thus, we consider the condition ''distraction" as an active control group. The instruction provided in the distraction condition, however, does not refer to the contents of the videos and, thus, should not impact the perceived relevance for one's own future expectations.

The no-manipulation control group did not receive any instruction before watching the videos.

Measures

Expectations of future life events

For the assessment of expectations of future life events, we used a German adaption of the ''Future events questionnaire" (Miranda & Mennin, 2007). This task consists of a list of 17 positive and 17 negative future events covering a range of important areas of life, such as ''being socially inadequate" (negative) or ''having a successful career" (positive). Participants received the following instruction for completing the questionnaire: ''For each of the following events, please rate how likely you think it is that you will experience it at some point in the future. How likely do you think it is that ..." Then the 34 life events were presented and participants were asked to predict the likelihood of each event to happen to them on a five-point Likert scale ranging from 1 (''not at all likely") to 5 (''very likely"). High ratings for positive events indicate higher levels of optimistic expectations, while high ratings for negative events indicate a higher level of pessimistic expectations. The FEQ has shown good to excellent internal consistency with α = 0.87—0.91 (Miranda et al., 2017).

Cognitive immunization

For the assessment of cognitive immunization, we developed a novel questionnaire to assess participants' appraisal of the videotaped patient reports (''Cognitive Immunization Against Other People's Experiences", CIA-OPE). This questionnaire is adapted from the ''Cognitive Immunization against Performance Feedback scale" (CIPF; Kube, Glombiewski, et al., 2019), assessing cognitive immunization in the context of performance feedback. When developing the items for this new measure, we referred to the model by Rief et al. (2015) and its revision by Panitz et al. (2021), according to which cognitive immunization is a cognitive process of retrospective devaluation of expectation-disconfirming experiences. Further, it has been distinguished between data-oriented immunization strategies (i.e., regarding the experience as exception of the rule) and concept-oriented immunization strategies (i.e., questioning the concept salient in the situation). The scale consists of 15 items, of which 11 items assess data-oriented strategies (e.g., ''I consider it as an exception that psychotherapy leads to such a positive development as in the case of the person in the video.") and four items assess concept-oriented strategies (e.g., ''The video illustrates that psychotherapy can be helpful."; reversely scored). Participants were asked to rate how much they agree with each item on a 7-point Likert-scale from 1 (''Totally disagree") to 7 (''Totally agree"). High scores on the scale represent a high level of cognitive immunization. The English version of the CIA-OPE can be found in the supplement.

Interpretation

It is well established that depression is related to a negative interpretation bias, i.e., the propensity to interpret ambiguous information negatively (Everaert et al., 2017; Everaert, 2021). Biased interpretation could also be a mechanism underlying the persistence of dysfunctional expectations. Thereby, interpretation bias and cognitive immunization differ in so far as the interpretation already takes place *during* the expectation violation, while cognitive immunization comes into play *after* the expectation violation (Kube & Rozenkrantz, 2021). By assessing interpretation bias, we aimed to control a) whether there is evidence of a negative interpretation bias while watching the experience reports and b) whether this systematically impacts change in expectations. Therefore, we developed seven items, which measure how the characters and their narratives were perceived by participants (e.g., ''The person made the impression that they still felt depressed after the therapy.", ''The person made the impression that they

enjoyed their life again." (reversely scored)). For each item, participants were asked how much they agreed on it with a 7-point Likert-scale from 1 (''Totally disagree") to 7 (''Totally agree"). High scores on the scale represent a high level of negative interpretation bias. The English version of the items can be found in the supplement.

Recall

Another frequently investigated cognitive bias in depression is memory bias, which manifests itself in reduced recall of positive and increased recall of negative information (Everaert et al., 2022). This bias could also be related to persistence of negative expectations as depressed people may have difficulty recalling positive information. However, this has not yet been tested systematically (Kube, 2022). Analogous to the interpretation bias, we aimed to check whether the recall of the content of the videos is systematically negatively biased and, if so, whether this has an influence on the change in expectations. Participants were asked to answer five content-related questions for each experience report. For example, one item referring to the report of the character named Anna-Lena was: ''At the end of the therapy, Anna-Lena cancels fewer appointments as compared to the beginning of the therapy." For each item, participants had to rate whether the respective statement was correct or not. The amount of correct answers represents the degree of correct recall. The English version of the items can be found in the supplement.

Feedback of participants

Oral Feedback. Oral feedback about the procedure was obtained at the end of the procedure via a semi-structured interview, with which we assessed how demanding, interesting and comprehensible participants perceived the study procedure.

Written Feedback. Written feedback was obtained at the end of the procedure through two open text boxes. Specifically, we asked participants to report a) about comprehension problems and b) general feedback about the contents and the procedures of the study.

Statistical analysis

The novel experimental paradigm was evaluated using both qualitative and quantitative data. Quantitative data was used for the evaluation of the outcome measures and the suitability of the paradigm to investigate expectation change. For the descriptive analysis of the quantitative data, we used R-Studio (version 2021.9.2.382; RStudio Team, 2022), as shared on https://osf.io (Stadlmeier et al., 2022c). For data preparation, we used the package ''car" (Fox & Weisberg, 2019). For descriptive statistics, we used the package ''psych" (Revelle, 2021). To evaluate adherence, we examined participants' qualitative answers regarding the noted similarities vs. dissimilarities vs. physical appearance by assigning them to predefined categories and evaluated them in terms of how concrete vs. unspecific they were. Participant feedback was evaluated by counting how often specific feedback was provided.

Results

Feasibility

Feedback of participants

Written Feedback. Of those participants who provided written feedback, the following impressions were obtained: it was interesting to watch the experience reports (n = 1); the instruction of the ''immunization inhibition"-condition was difficult, because it was challenging to find similarities between oneself and all the characters (n = 1); too little information about potential causes of depressive disorders as well as associated personality traits was provided (n = 1). No comprehension problems were reported. Both native and non-native German speakers reported that they were able to understand the content of the instructions and the videos well.

Oral Feedback. Oral feedback was obtained from all participants and a frequently reported impression was that participants perceived the study as being too long and exhausting. Further comments were: The people in the videos were not real patients (n = 3); could identify myself very well with one of the characters (n = 1); it was interesting to see different characters in different life situations dealing with the same diagnosis (n = 3); relieved that the people in the videos talked so openly about their disorder (n = 1); it was difficult to find similarities or differences with all the characters (n = 2).

Adherence to study procedures

To evaluate participants' adherence to the instructions from the experimental conditions, we examined the content of the similarities vs. dissimilarities vs. physical appearance which participants noted in the open text fields. All participants did note down something. To evaluate the contents of participants' notes, we predefined 11 categories for the two experimental conditions (e.g., ''Symptoms" or ''Social relationships") and 8 categories for the distraction condition (e.g., ''hair" or ''clothing") into which we assigned participants' answers, as shared on https://osf.io (Stadlmeier et al., 2022b). For example, we assigned the answers ''I am also always tired." and ''I also have concentration problems." to the category ''Symptoms". Further, we checked how often on average participants gave unspecific answers, i.e., we examined whether the participants referred to concrete aspects (e.g., ''I am also in a committed relationship.") or whether they gave abstract answers (e.g., ''My life circumstances are similar."). In sum, participants gave unspecific answers considering M = 0.2 videos (R = 0—4). On average, participants related to M = 2.38 (SD = 0.57) topics (e.g., symptoms, relationships, life circumstances) or, in the distraction condition, to M = 2.92 (SD = 0.48) aspects of physical appearance (e.g. hair, clothing, mimic), respectively.

Outcome measures

Cognitive immunization

Across all conditions, cognitive immunization varied between M = 2.45 and M = 2.88 (SD = 0.60), indicating a

moderate to low value for cognitive immunization on this 7-point scale. On average, the individual items yielded different scores: the lowest level of cognitive immunization was measured on item 12 (''The video illustrates that psychotherapy can be helpful."; *M* = 1.47 (*SD* = 0.67)) and the highest on item 9 (''The person from the video and I are very similar, so I can imagine that therapy will help me as much as it helped them."; *M* = 4.24 (*SD* = 0.99)). The intercorrelations can be found in the supplement. For an overview of cognitive immunization for each condition and each video see Table 2.

Credibility and Authenticity. Within the CIA-OPE, there were two items that measured the perceived credibility (Item 14) and authenticity (Item 15) of the videos. As these items are very informative for assessing the quality of our videos, we report their characteristics additionally. Item 14 (''The report of this person is not credible.") reached a mean value of *M* = 1.58 (*SD* = 0.63) and item 15 (''The report of this person is not authentic.") reached a mean value of *M* = 1.82 (*SD* = 0.63), indicating low values for cognitive immunization on the 7-point scale.

Interpretation bias and recall

Across experimental conditions, interpretation of the five videos varied between *M* = 1.19 (*SD* = 0.31) and *M* = 2.08 (*SD* = 0.57), indicating low values for negative interpretation bias on the 7-point scale. The amount of correct answers varied across the five videos between *M* = 4.76 (*SD* = 0.75) and *M* = 4.94 (*SD* = 0.24), whereby a maximum of five correct answers was possible each. For an overview see Table 3.

Change of expectations

Descriptive comparisons of mean values indicate that across all conditions, expectations for experiencing positive events slightly increased from before watching the videos (*M* = 2.92, *SD* = 0.59) to after it (*M* = 3.15, *SD* = 0.72). Similarly, expectations for experiencing negative events decreased (from *M* = 3.07, *SD* = 0.64 to *M* = 2.99, *SD* = 0.79). With all due caution because of the purely descriptive inspection of the data, the findings indicate that participants from the cognitive immunization-inhibiting condition showed the greatest increase in positive expectations and decrease in negative expectations. With regard to the control group, it is interesting to note that, surprisingly, both pessimistic and optimistic expectations increased. Due to the small sample size however, the robustness of this finding is limited, though. Fig. 2 shows the change in expectations for the four experimental conditions.

Discussion

The aim of this study was to develop and preliminarily evaluate a novel experimental paradigm to examine change in expectations about positive and negative life events in response to other patients' positive experience reports in depression. As patients often ask other patients about their experiences with psychotherapy, it is of particular interest to understand how positive information received from other patients is used to modify negative expectations. Previous studies investigating biased belief updating in depression

Table 2 Level of cognitive immunization on a scale from 1 (low level of cognitive immunization) to 7 (high level of cognitive immunization).

Condition	Character	*M (SD)*	*Min*	*Max*
Immunization inhibition (*n* = 6)	Anna-Lena	2.38 (0.73)	1.27	3.07
	Maria	3.02 (0.69)	2.00	3.73
	Gabi	2.94 (0.77)	2.00	3.93
	Mateo	2.90 (1.01)	1.67	4.53
	Erwin	3.13 (0.97)	1.40	4.20
	Total	**2.88 (0.60)**	**2.15**	**3.67**
Immunization promotion (*n* = 5)	Anna-Lena	2.25 (0.93)	1.20	3.20
	Maria	3.29 (0.98)	1.67	4.27
	Gabi	2.93 (1.12)	1.33	4.20
	Mateo	2.16 (0.88)	1.20	3.47
	Erwin	3.44 (0.55)	2.67	4.07
	Total	**2.82 (0.52)**	**2.15**	**3.52**
Distraction (*n* = 5)	Anna-Lena	2.25 (0.43)	1.53	2.53
	Maria	2.91 (0.95)	1.47	3.93
	Gabi	2.39 (1.00)	1.60	3.80
	Mateo	2.65 (0.43)	2.07	3.27
	Erwin	3.28 (0.73)	2.53	4.27
	Total	**2.70 (0.25)**	**2.40**	**3.09**
Control Group (*n* = 1)	Anna-Lena	1.53 (NA)	1.53	1.53
	Maria	2.13 (NA)	2.13	2.13
	Gabi	3.40 (NA)	3.40	3.40
	Mateo	2.93 (NA)	2.93	2.93
	Erwin	2.27 (NA)	2.27	2.27
	Total	**2.45 (NA)**	**2.45**	**2.45**

Table 3 Interpretation bias and recall.

M(SD)	Character				
	Anna-Lena	Maria	Gabi	Mateo	Erwin
Interpretation	2.08 (0.57)	1.19 (0.31)	1.34 (0.38)	1.66 (0.46)	1.66 (0.81)
Recall	4.94 (0.24)	4.94 (0.24)	4.94 (0.24)	4.76 (0.75)	4.82 (0.39)

Note. Interpretation (scale from 1 to 7): High values indicate a high level of negative interpretation bias; Recall: Values represent mean values of correct answers, a value of 0 would represent 0% correct answers, a value of 5 would represent 100% correct answers.

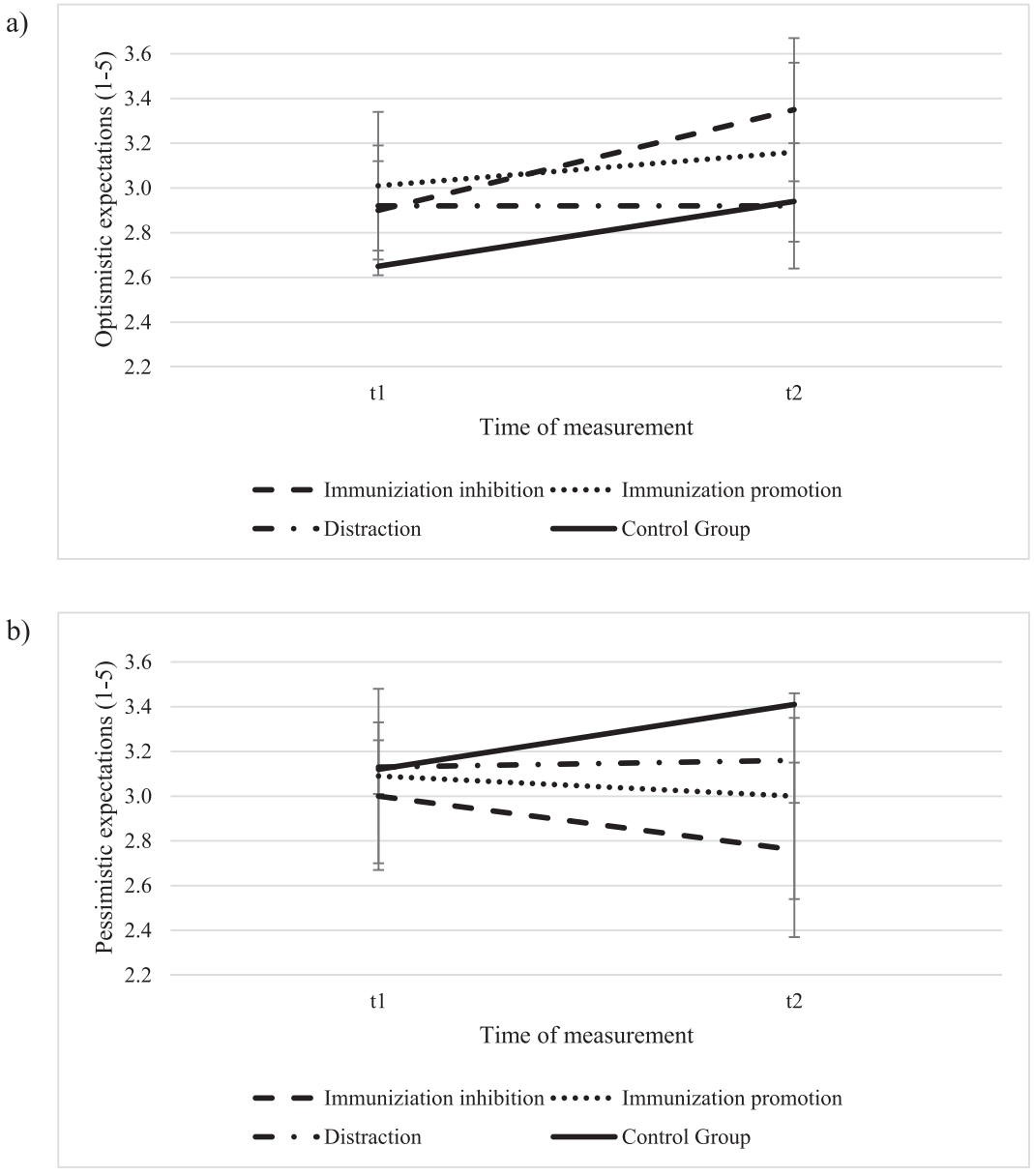


Fig. 2 a) Optimistic expectations at t_1 and t_2 on a scale of 1 (''not at all likely") to 5 (''very likely"); b) pessimistic expectations at t_1 and t_2 on a scale of 1 (''not at all likely") to 5 (''very likely"); Note. Error bars indicate ± 1SE.

mostly had quite a narrow focus in terms of the beliefs being studied and the experimental tasks being applied, thereby limiting the external validity (e.g., Everaert et al., 2018; Groth & Rief, 2022b; Kube et al., 2018). By contrast, the current task was designed to have a high external validity by considering patients' expectations to experience positive

vs. negative everyday life events before vs. after watching videos of other patients reporting on how psychotherapy helped them experience more positive life events. The basic design of this novel paradigm was supplemented by a manipulation of cognitive immunization and distraction, in order to examine their influence on the integration of the other patients' experiences into participants' future expectations. The results of this small feasibility study indicate that the paradigm is applicable, i.e., participants adhered to the instructions and reported no comprehension problems. All constructs could be assessed as intended. According to participants' feedback, the videos were perceived as credible, interesting and helpful. However, three out of the 17 participants suggested that the people in the videos were not real patients, which could have limited the perceived value of the video reports and thus, could have impacted participants' behavior. Future studies with larger samples are necessary to clarify how early doubts regarding the authenticity of the videos may affect the usefulness of the videos. Further, the study was also perceived as very long. Especially in depressed subjects, this might lead to fatigue effects and thus impact the quality of the assessed data. Thus, it should be considered to shorten the procedure, for example by presenting videos from only four patients instead of five.

In line with the rationale of the present task, descriptive results hint that watching positive experience reports may indeed lead to a slight increase in optimistic future expectations and decrease in pessimistic future expectations. Furthermore, on a descriptive level, we found some cautious support for the rationale of the study that inhibiting the engagement in cognitive immunization can promote change in future expectations. However, due to the small sample size, these results are hardly interpretable and a follow-up study using a sufficiently large sample to allow hypothesis testing is warranted.

Limitations

The most significant limitation of this study is the very small sample size, which prevents us from evaluating the suitability of the paradigm using inferential statistics. Instead, we could only descriptively analyze some coarse-grained trends, in addition to the evaluation of the feasibility of the experimental procedures. Relatedly, the small sample size prevented us from examining the psychometric properties of the newly developed measures sophisticatedly. A limiting factor of the applicability of the paradigm is its focus on psychotherapy, which makes it difficult to apply it in a non-clinical control sample. Further, we provided participants in this study only with positive experience reports, and it might be interesting for some research questions to add also a condition, in which participants watch videos of patients reporting on negative experiences with psychotherapy. Since it is likely that people suffering from depression are also confronted with negative opinions about psychotherapy, it could be worthwhile to include such a condition in future studies.

Future directions

Based on our results, we suggest that the paradigm is suitable to investigate expectation change in depression. It is easily adaptable and thus could be a convenient tool for including other relevant outcome measures, such as the enhancement of treatment expectations, which, as demonstrated by Seewald and Rief (2022), can be obtained through effective expectation violations. As treatment expectations have been shown to have an impact on therapy process and outcome (Meyer et al., 2002; Meyerhoff & Rohan, 2016), we think it would be worthwhile to examine whether an experimental enhancement of treatment expectations in turn influences the treatment process and treatment outcomes. Since our paradigm explicitly addresses the psychotherapeutic context, it could be used for investigating responses of patients, who are considered as rather treatment-resistant and to hold rather rigid dysfunctional believes such as people suffering from persistent depressive disorders (Rief & Joormann, 2019).

Future studies should consider whether to adopt our approach of using actors instead of real patients. From an ethical point of view, our approach brings about challenges. For example, participants could react with irritation to the debriefing. To be able to address such potential feelings, participants in our study were in touch with study assistants via telephone during the entire study procedure. This allowed us to respond to questions or concerns regarding the debriefing, such that all participants were fine with our approach. However, future studies might consider to choose real patients if they were able to cover the various facets of depression to circumvent these ethical challenges.

Conclusion

This paradigm was developed to investigate expectation change in people with depressive disorders in response to reports of other patients' positive experiences with psychotherapy. Our results seem to be promising in so far as the paradigm seems to initiate an increase in optimistic and decrease in pessimistic expectations. So far, to our knowledge, this experimental paradigm is the first using personal treatment reports of other patients to investigate expectation change in depression. Due to its high ecological validity, we are confident that the paradigm is a useful tool for investigating multiple research questions in the context of belief updating in depression. The results presented in this small feasibility study may provide a good basis for applying the paradigm in a larger follow-up study.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.jbct.2023.10.001.

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Anhang B: Artikel 2

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How people with major depression adjust their expectations of future life events in response to other patients' reports of the positive effects of psychotherapy

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ABSTRACT

Research proposed the devaluation of positive information, referred to as cognitive immunisation, as a mechanism underlying the persistence of negative expectations in depression. In a pre-registered experimental study, we tested this hypothesis by enhancing vs. inhibiting the engagement in cognitive immunisation and comparing it with a distraction control condition and a no-instruction control condition. In a between-subjects design, we presented participants with major depression ($N = 156$) with video recordings of other patients in which they reported on the positive effects of psychotherapy. Cognitive immunisation was manipulated by instructing participants to focus on similarities vs. differences between themselves and the persons from the videos. The results show that the other patients' reports led to a significant increase in participants' expectations of future life events and treatment expectations. However, there were no significant differences between the experimental conditions in expectation change, most likely because the manipulation was not powerful enough according to the manipulation check. Only in men the cognitive immunisation-promoting condition effectively blocked expectation change, according to exploratory analyses. This study shows that watching positive reports from other patients helps people with major depression improve their pre-treatment expectations. However, cognitive immunisation does not modulate this process, unless gender is considered.

Introduction

Cognitive models of depression propose that in people with depression, beliefs about future events or experiences, referred to as expectations, are shaped negatively (Beck et al., 1979). Indeed, research has shown that negative expectations are a core feature of depression (Horwitz et al., 2017; Kube et al., 2018; Strunk et al., 2006). However, in recent years, research has suggested that it is not so much the content of expectations that is aberrant in depression, but the inability to revise negative expectations in response to novel positive experiences (Barrett et al., 2016; Kube et al., 2020; Rief & Joormann, 2019). This shift of the focus to the changeability of expectations in depression is vital to understanding how a negatively coloured mental reality is construed and sustained. In particular, if people fail to use novel positive experiences to revise negative expectations, it is likely that negative expectations will stabilise or reinforce. As a result, the disregard of novel positive information can perpetuate the negative emotional (e.g., feeling upset) and behavioural (e.g., social withdrawal) consequences of negative beliefs (Everaert et al., 2020).

The shift to the changeability of expectations has been inspired by research from general psychology and cognitive neuroscience on how people update their beliefs in light of new information, referred to as belief updating (Kube & Rozenkrantz, 2021; Sharot et al., 2023; Sharot & Garrett, 2016). In this context, it has been proposed that the more certain people are that their beliefs are true, the less beliefs are revised even if they are challenged by disconfirmatory evidence (Kanai et al., 2015; Paulus et al., 2019). Thus, the certainty about the veracity of beliefs is closely linked to the ability to update beliefs. Since research has demonstrated that people with depression tend to be very certain about negative beliefs, such as beliefs about the occurrence of negative future life events (Andersen, 1990; Miranda et al., 2023; Rosario-Williams et al., 2021), it should follow that people suffering from depression have difficulty adjusting negative beliefs in response to novel positive information. This is precisely what research on belief updating has shown in

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the last few years (Kube, 2023).

For instance, researchers found that patients with major depressive disorder (MDD) struggle to revise negative performance expectations when receiving positive feedback for their performance in an emotion recognition test, whereas healthy individuals do adjust their expectations in line with the positive feedback (Kube, Rief, et al., 2019). Relatedly, other studies demonstrated that elevated depressive symptoms were associated with a reduced revision of performance expectations in non-clinical (Feldmann et al., 2023; Kube & Glombiewski, 2021, 2022) and at-risk samples (Kube et al., 2023). Similarly, investigations into the update of interpersonal beliefs showed that elevated depressive symptoms were associated with difficulty revising established negative interpretations in response to novel positive information (Deng et al., 2022; Everaert et al., 2018, 2020). Furthermore, research has revealed that while healthy people usually adjust their expectations for future life events more in response to positive than in response to negative information, this positivity bias is absent in people with MDD (Garrett et al., 2014; Hobbs et al., 2022; Korn et al., 2014). Thus, different lines of research have converged on the finding that depression is related to a deficient revision of negative expectations in response to novel positive information.

Several potential mechanisms have been discussed to underlie these problems in information processing, such as interpretation biases (Everaert et al., 2017), cognitive inflexibility (Miranda et al., 2012; Stange et al., 2017), prediction error processing (Spaeth et al., 2024), and reward insensitivity (Borsini et al., 2020; Eshel & Roiser, 2010; Whitton et al., 2015). Recently, research has suggested that also cognitive immunisation – a cognitive devaluation of expectation-disconfirming information – might contribute to the lack of expectation change in depression (Kube et al., 2017, 2020; Rief & Joormann, 2019). In particular, drawing from expectation models from the general psychology literature (Panitz et al., 2021; Pinquart et al., 2021; Rief et al., 2015), it has been proposed that people with depression may engage in cognitive immunisation by negatively re-appraising unexpectedly positive information, e.g., by doubting the validity of that information, considering it a non-representative exception, or questioning the relevance of such information for one's personal life. As a result, people's expectations become immune to updating and learning from new experiences.[1]

Preliminary evidence supports the proposition of cognitive immunisation as an important mechanism of lacking expectation change: a proof-of-concept study in the context of performance feedback demonstrated that in people with elevated levels of depressive symptoms, the degree of change in performance expectations was modulated by an experimental manipulation that aimed to increase vs. decrease the value of positive performance feedback (Kube et al., 2019). In line with this finding, another study examining an inpatient sample of patients with MDD found that increasing the value of unexpectedly positive performance feedback (by underscoring its validity and relevance for people's personal lives) inhibited the engagement in cognitive immunisation and boosted the degree of change in performance expectations (Kube et al., 2019). On the other hand, people without depressive symptoms were found not to be prone to devaluing positive performance feedback, even if the engagement in cognitive immunisation was promoted (Kube & Glombiewski, 2021, 2022).

Although the extant evidence for cognitive immunisation as a mechanism underlying the lack of expectation change in depression is promising, it is very limited as it has to date only been investigated in the context of performance feedback. Accordingly, a major goal of the present research was to apply a manipulation of cognitive immunisation in another context. To this end, we chose to focus on people's expectations of future life events as examined in a series of studies by Miranda and colleagues (Matuza et al., 2023; Miranda et al., 2017, 2023; Rosario-Williams et al., 2021). This line of research has demonstrated that depression is associated with the enhanced prediction of negative events (e.g., "Get the blame for things going wrong") and the reduced prediction of positive events (e.g., "Have a successful career"). Some of these studies, though, showed that this asymmetry in predicting future life events can be reduced through induced optimism (i.e., practice in making optimistic predictions) (Matuza et al., 2023; Miranda et al., 2017).

The present study

In the present study, we applied a manipulation of cognitive immunisation to the future life event task by Miranda and colleagues to investigate whether a modulation of cognitive immunisation alters expectations of future life events in patients with MDD. To this end, we used a recently developed adaptation of this future event task (Rapo et al., 2023). In this adapted task, participants initially indicate their expectations for positive vs. negative future life events, before they watch video-taped reports of formerly depressed patients who explain how psychotherapy helped them experience more positive life events. Subsequently, their expectations of future life events are assessed again, such that expectation change in response to the positive video reports can be examined.

Here, we aimed to manipulate the engagement in cognitive immunisation against these positive video reports by instructing participants to focus on differences vs. similarities between their own life situation and the other patients' ones and, relatedly, reasons for why psychotherapy may vs. may not be as effective for them as for the other patients. The focus on differences was supposed to enhance cognitive immunisation by prompting the thought that the positive experiences of the other patients can hardly be applied to the participants' own situation and that the fact that the other patients benefited from psychotherapy therefore does not say much about the likelihood that the participants themselves will benefit from it. The focus on similarities, on the other hand, was intended to inhibit the engagement in cognitive immunisation by facilitating the transfer to the participants' own situation. To be able to test whether really the contents of this cognitive immunisation manipulation and not just any unspecific instruction regarding the videos influences expectation change, we also added an experimental group which was instructed to focus on the physical appearance of the patients in the videos, referred to as distraction control group. Furthermore, there was a no-instruction control group, which did not receive any instruction prior to watching the other patients' videos. Accordingly, the main hypothesis was that people with depression revise their initial expectations of future life events more if cognitive immunisation against positive experiences of other patients is inhibited, as compared to the promotion of cognitive immunisation, the distraction control group, and no-instruction control group.

An additional goal of the present study was to investigate how cognitive immunisation relates to other well-established cognitive factors of depression: negative interpretations and deficient recall of positive events. To this end, we assessed the interpretation and the recall of the contents presented in the video reports. We did not expect any group differences in interpretation and recall, but assumed that across groups the degree of cognitive immunisation would be modestly associated with the endorsement of negative interpretations and deficient recall.

Methods

Ethics

The study was approved by the local ethics committee of the

[1] Note that this has some conceptual similarities to the literature on "dampening appraisals", which has been shown to reduce positive affect and increase negative affect (Burr et al., 2017; Dunn et al., 2018; Yilmaz et al., 2019), but has not yet been systematically applied to clinically depressed individuals.

Department of Psychology at the university where the study was conducted (reference number LEK-190_2019). It was conducted in accordance with ethical standards as laid down in the 1964 Declaration of Helsinki and its later amendments. All participants gave written informed consent.

Transparency and Openness

The hypotheses, methods, and the analysis plan were preregistered (https://aspredicted.org/65B_3L2) on 2021-07-21, prior to data collection which began on 2021-08-11. After extensive discussion, we opted against fully sharing the anonymised data through the OSF or other data repositories, because we worried that highly potent data-analytic algorithms might be able to de-anonymise the patients' identity with a certain probability when taking into account that it is publicly known where the study was conducted and, accordingly, in which geographical area the patients live. As all participants suffered from depression, identification of patients would be accompanied by recognising the diagnosis. Yet, the data and the analysis code will be made available to other researchers upon reasonable request.

Participants

We recruited participants from a university outpatient clinic and several private psychotherapy practices in the surrounding of the university. Participants were included if they currently met the criteria of a major depression (ICD-10: F32.0-F32.2, F33.0-F33.2) or dysthymia (F34.1) as the primary diagnosis, as ascertained by a structured clinical interview. In 94.2 % of all cases, the Structured Clinical Interview for DSM-5 (SCID) was used to determine the diagnosis (Beesdo-Baum et al., 2019). In 4.5 % of the cases, the German "Diagnostisches Kurz-Interview bei psychischen Störungen" (Mini-DIPS) was used (Margraf, 1994), which was followed by an interview that was specifically developed to assess whether people meet the criteria of a PDD (Klein et al., 2018). In two patients (1.3 %), another unspecified clinical interview was conducted, followed by the PDD interview. The SCID and PDD interviews were conducted by psychotherapists in training under the supervision of a licensed psychotherapist or by psychology master students, who were specifically trained in the SCID/PDD interview and supervised by a licensed psychotherapist. The Mini-DIPS and the unspecified interviews were conducted by licensed psychotherapists from private practices. Further inclusion criteria were: patients had to be still in the diagnostic phase prior to psychotherapeutic treatment or at the very beginning of their psychotherapeutic treatment (maximum of 5 sessions completed); be at least 18 years old; and be fluent in German. Exclusion criteria were: psychotic symptoms and bipolar affective disorder; less than one month of abstinence in a given substance use disorder; intake of neuroleptic medication or benzodiazepines in the last month; neurological disorders which could impair cognitive functions. Participants received financial compensation (15€) for their participation.

The pre-registered a-priori power analysis indicated a minimum sample size of 149 participants (expected effect size: $f = .275$; power = .80; $\alpha = .05$; groups: 4; numerator df: 3). This effect size was estimated based on previous studies, which manipulated cognitive immunisation in individuals with depressive symptoms and found medium (or slightly larger) effects of this manipulation on expectation change (Kube et al., 2019; Kube et al., 2019). A total of 161 patients were included and began to work on the study. Of these, one person had to be excluded because there turned out to be a diagnostic failure; that is, contrary to the initial assessment, the person did not have MDD as the primary diagnosis. Similarly, one person had to be excluded because it turned out that they had completed already seven psychotherapy sessions. Another two participants had to be excluded due to technical problems during the study completion, such that the video clips could not be played. In addition, one person had to be excluded as a statistical outlier (>3 *SD*s above the mean on the dependent variable). Thus, we had a final sample size of $N = 156$ patients with major depression as the primary diagnosis.

According to the ICD-10 diagnoses, 21.2.% met the criteria of a single major depressive episode, 44.2 % of a recurrent major depressive disorder, 16.7 % of a dysthymia, and 17.9 % of a "double depression" (dysthymia plus current depressive episode). According to the DSM-5, 65.4 % met the criteria of a non-persistent MDD and 34.6 % of a PDD. In a separate publication, which will combine the current data with another data set, we will systematically analyse differences between PDD and non-persistent MDD in terms of expectation change, cognitive immunisation, and other cognitive factors, so we will not examine that further here. In the current sample, 37.8 % had at least one comorbid mental disorder. In terms of the secondary diagnosis, 10.3 % met the criteria of a social anxiety disorder, 7.7 % generalised anxiety disorder, 5.1 % substance use disorder, 3.2 % somatoform disorder, 2.6 % panic disorder, 1.3 % posttraumatic stress disorder, .6 % each obsessive-compulsive disorder, hyperkinetic disorder, and attention deficit hyperactivity disorder, and 4.5 % other anxiety disorders. In this sample, 12.2 % also met the criteria of an additional third mental disorder, of which generalised anxiety disorder and other anxiety disorders (3.2 % each) were the most frequent ones. In terms of the severity of depressive symptoms, the mean BDI-II score was 28.78 ($SD = 9.79$), reflecting moderate to severe depressive symptoms (Beck et al., 1996). About one third (32.7 %) of the sample took antidepressant medication, with Sertraline (7.7 %) being the most frequently used antidepressant, followed by Escitalopram (5.1 %), and Citalopram (3.2 %). The other 67.3 % did not take any psychopharmacological medication.

Participants' age ranged from 18 to 70 ($M = 34.72$, $SD = 13.28$). In terms of gender, 67.3 % reported to be female, 30.8 % male, and three persons (1.9 %) reported their gender to be diverse. In terms of the highest educational degree, 39.2 % had the school leaving examination comparable to high school graduation (German "Abitur" or "Fachabitur"), 30.8 % had primary education, 21.8 % had a university degree, 1.9 % were still at a secondary school, and 6.4 % had other educational degrees. In this sample, 44.9 % were employees, 22.4 % were university students, 6.4 % were unemployed, 5.8 % were in training, 2.6 % were self-employed, 1.9 % were still at school, 1.3 % were civil servants, and 14.7 % reported to have other occupations (e.g., being on parental leave, disabled, homemaker).

General procedure

If participants were included, an individual appointment for the study participation was scheduled. At this appointment, participants completed the study online at home, while being assisted by a student research assistant via phone. The main reason for why participants completed the study at home was the COVID-19 pandemic and the restrictions related to it at the time when the study began. Data were collected between August 2021 and April 2024. Participants completed the study using the online survey platform www.soscisurvey.de, which lasted about 65 min.

At baseline, participants completed an assessment of expectations of future life events (primary outcome) and their expectations of the effects of psychotherapeutic treatment (secondary outcome). Subsequently, participants watched a total of 4×2 videos (for details of the stimuli, see next section). Specifically, they first saw a video of a patient who explained they were at the beginning of their psychotherapeutic treatment and suffering from quite severe depressive symptoms. Depending on the specific experimental condition, to which participants were randomly assigned, the video was preceded by a particular instruction what to focus on and followed by the instruction to note their observations in an open text field. Subsequently, participants watched a second video of the same patient, who now explained that they were at the end of their psychotherapy and have benefitted from it quite significantly. Here, participants again received different instructions depending on the specific experimental condition. After watching the second video, participants were asked about their recall of the contents,

the interpretations of the contents from the two videos, and their potential engagement in cognitive immunisation.

This procedure was repeated for another three acting patients, each of which was shown both at the beginning of their therapy and at the end of it (see Fig. 1 for an illustration of the study design). The order in which the four characters were presented was randomised for each participant. This was a between-subjects design; that is, participants assigned to one condition followed the instructions of that condition for all four videos. After watching the videos from the last patient and completing the questions related to them, participants were asked again about their expectations of future life events as well as their treatment expectations, before completing questions about depressive symptoms and sociodemographic variables. Finally, participants were debriefed with respect to all details of the present study.

Stimuli

Participants watched a total of eight videos developed and validated previously (Rapo et al., 2023), in which four different persons reported on their situation both before treatment and at the end of it (see Supplementary Table S1 for a full description of all characters). Although participants were led to believe that these four persons were real patients, they were in fact amateur actresses/actors. We chose to show videos of acting patients instead of real patients for the following reasons. First, we aimed to show a number of different character profiles to cover some of the most important manifestations of depression (see below) and thought we would have more control over that when creating roles than when having people tell their real stories. Second, and relatedly, since the goal was to show each person twice, it would have been lacking authenticity if we had asked a patient from the beginning of their therapy to imagine themselves being at the end of the therapy and make up a story of how psychotherapy helped them; on the other hand, it would have been unauthentic to have a patient from the end of their therapy to reflect on what life was like at the beginning of therapy. Third, in terms of data protection, using real patients' reports would either have prevented us from sharing materials openly or endangering patients' privacy rights once material is shared on the internet.

When initially creating the roles for the patient characters, the researchers pursued two goals (Rapo et al., 2023): first, to make sure that participants could identify with at least one of the characters; and second, to cover the heterogeneity of depression. With respect to the latter, the videos covered the following clinical manifestations of depression: 1) anhedonia, along with problems concentrating, feeling worthless, and suicidal ideation; 2) depression with intense somatic symptoms such as headache, muscle tension, insomnia, and fatigue; 3) seasonal recurrent depression with listlessness, social withdrawal, and changes in appetite; 4) chronic depression with a pronounced loss of interest, psychomotor retardation, and escapism. In addition to these clinical features, the characters also varied in terms of age (25–63 years), gender (three female actresses vs. one male actor), profession (student vs. full-time working vs. part-time working vs. civil service), family status (in a couple relationship vs. single mum vs. married vs. divorced), and immigration history (one person with vs. three persons without immigration history). Originally, the researchers also developed a fifth character showing some pronounced melancholy (Rapo et al., 2023). For the present study, we removed this fifth character because we wanted to shorten the overall duration of the study to reduce the burden for participants (taking into account many patients' problems concentrating). In addition, the psychometric properties of the assessments related to this fifth character were relatively poor in the original investigation (Rapo et al., 2023).

In terms of contents, each (acting) patient introduced themselves in the first video, reported on their symptoms, their impairments, and explained why they were seeking treatment. They also mentioned explicitly that they were relatively pessimistic about their future. This video was shown to make sure that participants, who too were quite upset at the beginning of (or prior to, respectively) their own treatment, can identify with the characters from the video. In the second video, the acting patients explained how their symptoms, their quality of life, and

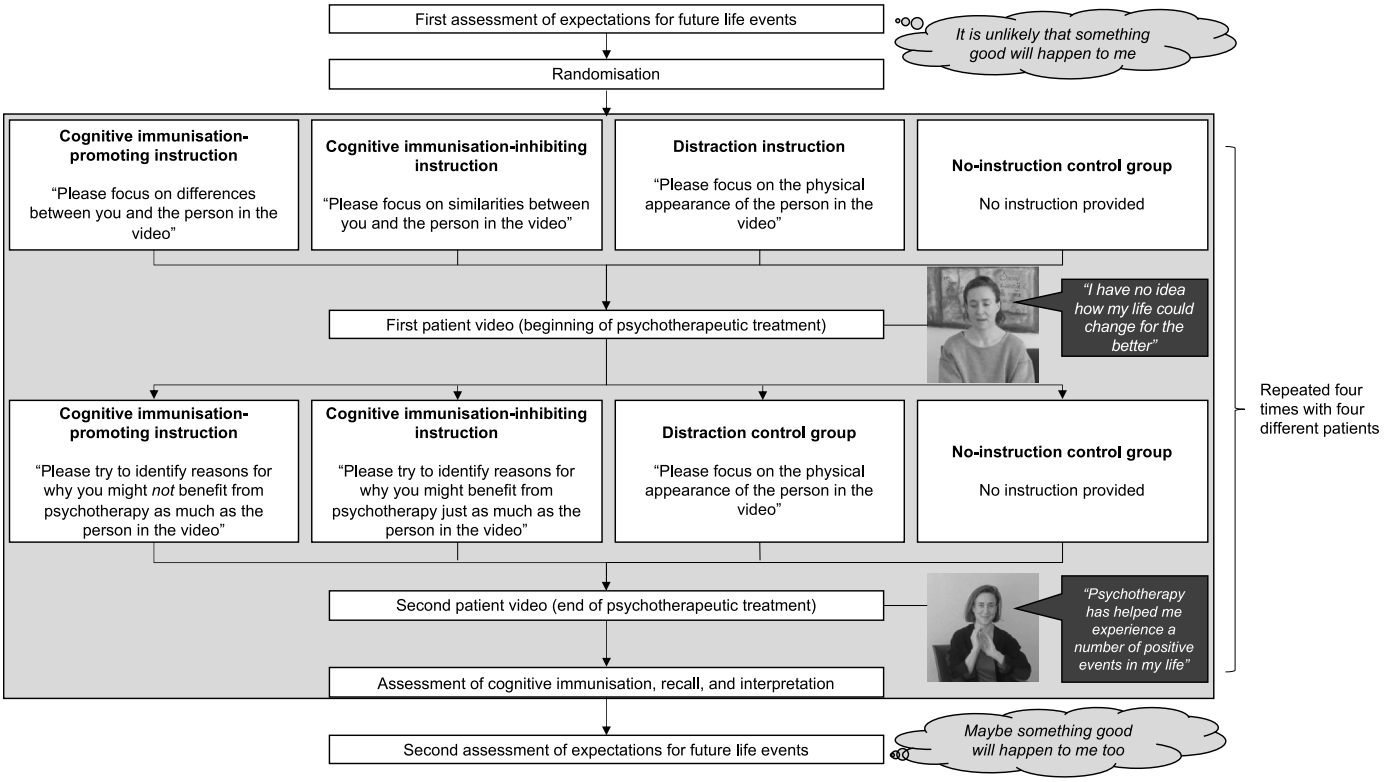


Fig. 1. Design and procedure of the study.

their overall well-being has improved through their psychotherapeutic treatment. Furthermore, they emphasised that because of the improvements through psychotherapy, their life has changed for the better, e.g., experiencing a number of positive life events. Overall, patients explained in the second video that they were quite optimistic about their future. The videos from the beginning of treatment were between 2:30 and 5:01 min long, and the videos from the end of treatment were between 2:07 and 4:10 min long.

Experimental conditions

Cognitive immunisation-inhibiting condition

Participants from this condition received the following instruction prior to each of the four videos from the beginning of the psychotherapeutic treatment: "As you watch, please focus specifically on similarities that you can identify between yourself and the person in the video." This instruction was supposed to inhibit the engagement in cognitive immunisation as we reasoned that the awareness of similarities between themselves and the other persons from the videos makes it difficult for participants to disregard the other persons' experiences. Thus, we assumed that focusing on similarities eases the application of the acting patients' experiences to the participants' own life situation, e.g., by thinking "As my situation is quite similar to that of the person from the video, I might benefit from psychotherapy just as much as they did." However, it should be noted that despite these theoretical considerations, no previous study had tested whether this focus on similarities (vs. differences) is really suitable to modulate the engagement in cognitive immunisation at the time when the study was planned.

Before watching the second video, participants received the instruction, "As you watch, please focus specifically on possible reasons for why you will benefit from psychotherapy just as much as the person from the video." We chose to use that slightly amended instruction as compared to the instruction before the first video, since instructing participants again just to focus on similarities would inevitably have led to the problem that their situation is fairly different just because the person in the second video is doing well at the end of their therapy, whereas participants still struggle with their depression at the beginning of/before psychotherapeutic treatment.

Cognitive immunisation-promoting condition

Participants from this condition received the following instruction prior to each of the four videos from the beginning of the psychotherapeutic treatment: "As you watch, please focus specifically on differences that you can identify between yourself and the person in the video." This instruction was intended to enhance the engagement in cognitive immunisation against the positive reports from the subsequent video at the end of therapy, for the following reason. When participants pay particular attention to differences between themselves and the person from the video, this may prompt the belief that their own situation is hardly comparable to the person from the video, thereby easing the disregard of the report of positive improvements through psychotherapy. After the first video of each acting patient, participants were asked to note down any differences they identified between themselves and the person from the video. Before watching the second video, participants received the instruction, "As you watch, please focus specifically on possible reasons for why you will *not* benefit from psychotherapy as much as the person from the video did."

Distraction control condition

In the distraction control group, participants received the following instruction, both before the first and the second video of the acting patients: "As you watch, please focus specifically on the physical appearance of the person in the video. Try to remember the main aspects (e.g., hair colour, hairstyle, clothes, colour of clothes, jewellery, etc.). You will need these observations for a subsequent task." As noted above, this active control group followed the rationale to be able to test whether really the content of the cognitive immunisation manipulation, as opposed to any unspecific instruction which interrupts the procedure, makes a difference to expectation change. A similar control group has successfully been used in other research on change in expectations for future life events (Miranda et al., 2017).

No-instruction control condition

The no-instruction control group did not receive any instruction before watching either of the videos.

Measures

Expectations of future life events

To assess participants' expectations for future life events, we used the Future Event Questionnaire (FEQ) by Miranda and Mennin (2007). Participants received the following instruction for completing the questionnaire: "For each of the following events, please rate how likely you think it is that you will experience it at some point in the future." The FEQ then presents participants with 17 positive (e.g., "Having a successful career") and 17 negative future events (e.g., "Get the blame for something going wrong") covering a range of important areas of life, such as social relationships, occupation, and finance. Participants' task is to indicate the likelihood of each event to happen to them on a five-point Likert scale ranging from 1 ("not at all likely") to 5 ("very likely"). High ratings for positive events indicate higher levels of optimistic expectations, whereas high ratings for negative events indicate a higher level of pessimistic expectations. Of note, in the present study we investigated only whether the perceived likelihood of positive and negative future life events changes, and, unlike previous research (Miranda et al., 2017; Rosario-Williams et al., 2021), did not assess the certainty of these future life event predictions. This was mainly because we expected the positive reports from other patients on how their lives changed through psychotherapy to influence participants' perceptions of the likelihood of future life events themselves, rather than the perceived certainty of their predictions.

To compute the FEQ total score, participants' ratings for the negative events are reversely scored. We decided to collapse positive and negative future events in the primary analysis because we did not expect a significant interaction with the experimental condition. That is, we did not expect the effects of the manipulation of cognitive immunisation to differ between positive and negative life events, in which case using the entire 34-item scale should offer more statistical power than using two separate 17-item subscales. Cronbach's α of the FEQ was .90 at baseline and .93 after watching the videos.

Expectations of psychotherapeutic treatment

Participants' expectations regarding the components and effects of psychotherapy were assessed using the "Milwaukee Psychotherapy Expectation Questionnaire" (MPEQ) by Norberg et al. (2011). The MPEQ comprises 13 items, which load on two factors: process expectations (e.g., "I expect my therapist will provide support") and outcome expectations (e.g., "After therapy, I will be a much more optimistic person"). The items are rated on an 11-point scale from 0 (="not at all") to 10 ("very much so"). In the present study, Cronbach's alpha of the MPEQ was $\alpha = .83$ *at baseline and* $\alpha = .86$ *after watching the videos.*

Cognitive immunisation

To assess participants' engagement in cognitive immunisation against the other patients' reports, we used the previously developed "Cognitive Immunisation Against Other People's Experiences" (CIA-OPE) scale (Rapo et al., 2023). From the original CIA-OPE scale, we used those five items with the highest face validity with regard to the cognitive immunisation manipulation and the best psychometric properties for the current analyses. Three items assess whether participants that think the issues about which the persons in the video talked apply to them as well (e.g., "The problems the person mentioned in the video

apply to me as well") and two items assess whether participants consider the other patients' reports to be authentic and credible (e.g., "The report of this person is authentic"). These items were assessed after the second video of each of the four characters. The items were rated on a 7-point Likert-scale from 1 ("totally disagree") to 7 ("totally agree") and they are scored such that high values reflect a high engagement in cognitive immunisation. Cronbach's alpha of the 5-item CIA-OPE for the first character was $\alpha_1 = .77$, *for the second character it was* $\alpha_2 = .73$, *for the third character, it was* $\alpha_3 = .74$, *and for the fourth character it was* $\alpha_4 = .73$. *For all characters together, Cronbach's alpha was* $\alpha = .83$. *For the sub-items referring to the comparability of participants' own situation and the person from the video, Cronbach's alpha was* $\alpha_{comparability} = .85$ *and for the items referring to the credibility of the reports, it was* $\alpha_{credibility} = .90$.

Interpretations

To assess whether participants are inclined to interpret the patients' reports negatively, we used a 7-item scale which was developed previously (Rapo et al., 2023). More specifically, these items were used to assess whether participants really interpret the patients' reports as speaking to the benefits of psychotherapy, in terms of improving their mood and their life situation, or whether they are inclined to interpret the patients' reports with more scepticism (e.g., "The person made the impression that they still felt depressed after the therapy"). We assessed such interpretations for two reasons: first, we wanted to explore whether negative interpretations of the patients' reports are related to low expectation change; and second, we sought to explore how such negative interpretations are associated with cognitive immunisation. The seven interpretation items were assessed after the second video of each of the four characters. The items were rated on a 7-point Likert scale from 1 ("totally disagree") to 7 ("totally agree"), with higher values reflecting more negative interpretations. Cronbach's alpha of the 7-item interpretation scale for the first character was $\alpha_1 = .86$, *for the second character it was* $\alpha_2 = .88$, *for the third character, it was* $\alpha_3 = .86$, *and for the fourth character it was* $\alpha_4 = .83$. *For all characters together, Cronbach's alpha was* $\alpha = .91$.

Recall

After the second video of each of the four characters, participants completed – in addition to the items regarding cognitive immunisation and interpretations – a number of items which assessed their recall of the contents from videos. Specifically, they were presented with five statements for each of the four characters (resulting in a total of 20 statements), some of which were correct, meaning that they indeed reflected an explanation of the person from the video, and some of which were incorrect, meaning that they did not correspond to the character's report. For instance, a correct statement from one of the videos was, "At the end of the therapy, Anna-Lena cancels fewer appointments as compared to the beginning of the therapy." Participants had to indicate whether the respective statements are correct. As with the interpretations, we aimed to assess participants' recall of the video-taped reports to explore whether it is associated with i) expectation change, given the well-known memory biases in depression (Ellwart et al., 2003; Everaert et al., 2014; Gotlib et al., 2011), and ii) cognitive immunisation. The total score for all four characters can range from 0 to 20, with a value of 20 reflecting that no single error in recall occurred.

Depressive symptoms

Depressive symptoms were assessed using the second edition of the Beck's Depression Inventory (BDI-II), which includes 21 items assessing depressive symptoms on a 4-point scale ranging from 0 to 3 (Beck et al., 1996). The sum score ranges between 0 and 63, and lower values indicate fewer depressive symptoms.

Statistical analyses

Because participants could only continue with the survey if they entered all values, there were no missing values for the experimental sessions. After data screening according to the recommendations by Tabachnick and Fidell (2019), baseline differences between the experimental conditions were analysed by performing analyses of variance (ANOVA) for continuous variables and χ^2-tests for categorical variables. For the manipulation check, a univariate ANOVA using the CIA-OPE total scores (averaged across the four videos) was performed. As pre-registered, the main analysis was a 4 (condition: cognitive immunisation inhibition vs. promotion vs. distraction control group vs. no-instruction control group) x 2 (time: baseline vs. after the video reports) ANOVA using the sum scores of the FEQ as the primary dependent variable. Another such 4 × 2 ANOVA was performed using the sum scores of the MPEQ as the secondary dependent variable. To examine associations between cognitive immunisation, interpretations, recall, and depressive symptoms, Pearson correlations were computed. Type-I error levels were set at 5 %. All analyses were performed using SPSS version 29.

Results

Baseline differences

Despite the randomisation, the cognitive immunisation-inhibiting condition ($n = 38$), the cognitive immunisation-promoting condition ($n = 39$), the distraction control condition ($n = 39$), and the no-instruction control condition ($n = 40$) significantly differed in terms of age, $F(3, 152) = 3.083$, $p = .029$, $\eta^2_p = .057$, 90 % CI [.003, .112], with the distraction control condition ($M = 40.21$, $SD = 14.75$) being significantly older than the other three conditions (~32–33 years). The four groups did not differ in their levels of depressive symptoms, $F(3, 152) = 1.055$, $p = .370$, $\eta^2_p = .020$, 90 % CI [0, .054], baseline expectations for future events, $F(3, 152) = .143$, $p = .934$, $\eta^2_p = .003$, 90 % CI [0, .004], and baseline treatment expectations, $F(3, 152) = 2.255$, $p = .084$, $\eta^2_p = .043$, 90 % CI [0, .091]. The experimental conditions did not significantly differ in the distribution of gender, $\chi^2(6) = 4.875$, $p = .560$, occupation, $\chi^2(21) = 18.191$, $p = .637$, and German as the native language, $\chi^2(3) = 5.927$, $p = .115$. However, again unintentionally, the conditions did significantly differ in the distribution of educational degrees, $\chi^2(210) = 34.001$, $p = .036$, with the cognitive immunisation-promoting condition showing a higher proportion of lower educational degrees than the other conditions.

Manipulation check

Across all four patient characters, the ANOVA indicated that experimental conditions did not significantly differ in their engagement in cognitive immunisation, $F(3, 152) = 1.475$, $p = .224$, $\eta^2_p = .028$, 90 % CI [0, .068], although descriptively the cognitive immunisation-promoting condition showed the highest engagement in cognitive immunisation and the cognitive immunisation-inhibiting condition the lowest, as intended (see Table 1 for all descriptive values). When controlling for the unintended significant group differences in age and education by adding both variables as covariates to the aforementioned analysis, the differences between the conditions in cognitive immunisation remained non-significant ($p = .307$), and neither age nor education had unique effects on cognitive immunisation ($p > .556$).

When considering the four patient characters from the videos separately, we found that the four experimental conditions differed significantly only for the video showing the 37-years old female patient with Spanish immigration history, $F(3, 152) = 3.742$, $p = .012$, $\eta^2_p = .069$, 90 % CI [.008, .127], with the cognitive immunisation-promoting condition showing significantly more cognitive immunisation than participants from the cognitive immunisation-inhibiting condition, $t(75) = 3.166$, $p = .002$, $d = .722$, 95 % CI [.258, 1.181] and the distraction control group, $t(76) = 2.775$, $p = .007$, $d = .628$, 95 % CI [.171, 1.081], reflecting medium to large effects. However, under the Bonferroni-Holm

Table 1
Descriptive values of the main study variables.

	Cognitive immunisation-inhibiting condition (n = 38)	Cognitive immunisation-promoting condition (n = 39)	Distraction control condition (n = 39)	No-instruction control condition (n = 40)
Cognitive immunisation, M (SD)	2.53 (.58)	2.84 (.59)	2.61 (.77)	2.64 (.74)
Interpretation, M (SD)	1.60 (.48)	1.63 (.49)	1.40 (.33)	1.60 (.42)
Recall, M (SD)	19.66 (.67)	19.18 (1.48)	18.95 (1.32)	18.98 (1.53)
Expectations of future events				
positive events pre, M (SD)	3.00 (.46)	2.90 (.58)	2.87 (.67)	2.98 (.57)
positive events post, M (SD)	3.13 (.63)	3.10 (.65)	3.06 (.73)	3.18 (.64)
negative events pre, M (SD)	2.82 (.58)	2.85 (.59)	3.03 (.69)	2.81 (.53)
negative events pre, M (SD)	3.02 (.66)	3.13 (.67)	3.27 (.80)	3.10 (.65)
total score pre, M (SD)	2.91 (.45)	2.88 (.50)	2.95 (.60)	2.89 (.49)
total score post, M (SD)	3.08 (.58)	3.11 (.56)	3.16 (.67)	3.14 (.59)
Expectations for psychotherapy				
pre, M (SD)	8.21 (.87)	7.95 (1.04)	8.52 (.99)	8.10 (1.10)
post, M (SD)	8.60 (.85)	8.51 (.97)	8.77 (.94)	8.43 (1.09)

Note: M = mean, SD = standard deviation.

correction, it was not significantly different from the no-instruction control group, t (77) = 2.008, p = .048, d = .452, 95 % CI [.004, .897]. For the other three characters, the experimental conditions did not significantly differ in cognitive immunisation (all p-values >.667).

When looking at the participants' qualitative statements regarding the cognitive immunisation-promoting instruction, it stands out that many participants noticed sharper differences between themselves and the person from the second video as compared to the other videos. Specifically, 15 participants stated that, unlike the character from the video, they had no children, and those who did have children themselves noted that their life situation was nevertheless "completely different", as they had no financial problems or had not lost their partner through death. Overall, participants' comments regarding their observed differences vs. similarities show that they correctly understood the instructions from the cognitive immunisation-promoting condition (e.g., "I believe that my problems are more profound than those of the person in the video") and the cognitive immunisation-inhibiting condition (e.g., "I also have hardly any motivation and no desire to do anything"). The comments from participants from the distraction control group also show that they correctly followed the instruction to focus on the physical appearance of the persons in the video (e.g., "The person was wearing normal plain clothing, blue jeans and a light grey pullover with a stand-up collar.")

When looking at the sub-scales of the cognitive immunisation scale referring to the comparability of the life situation and the perceived authenticity, separately, the experimental conditions did not significantly differ in cognitive immunisation across the four characters from the video (p > .464). As we suspected that there might be gender effects given that 3 of 4 characters in the videos were females and 2/3 of the participants were females, we exploratorily included gender as an additional factor in the ANOVA, although this was not part of the pre-registered analysis plan. Doing so revealed that the main effect of condition narrowly failed to reach significance for the authenticity subscale, F (3, 145) = 2.488, p = .063, η_p^2 = .049, 90 % CI [0, .101], while there was a significant condition by gender interaction, F (3, 145) = 3.113, p = .023, η_p^2 = .061, 90 % CI [.003, .117], indicating that in men, unlike in women, doubts about the authenticity of the video reports were triggered in the cognitive immunisation-promoting condition. By contrast, the engagement in cognitive immunisation in the other three experimental conditions did not differ between men and women. The main effect of gender was not significant, F (1, 145) = 1.573, p = .212, η_p^2 = .011, 90 % CI [0, .054]. For the items of the cognitive immunisation scale referring to the comparability, there was no significant condition by gender interaction, F (3, 145) = .350, p = .790, η_p^2 = .007, 95 % CI [0, .023].

Overall, the results of the manipulation check indicate that the cognitive immunisation manipulation was too weak to produce significant explicit effects. Although the four experimental conditions descriptively differed in the expected direction, these differences reached significance only for one of the four videos. The significant condition by gender interaction suggests that men and women responded differently to the reports from the video, if they were instructed to focus on differences between themselves and the persons from the video.

Primary outcome: group differences in expectations of future life events

Main analysis

The pre-registered ANOVA indicated a significant main effect of time, F (1, 152) = 45.198, p < .001, η_p^2 = .229, 90 % CI [.137, .318], reflecting that across conditions participants' expectations were more positive after watching the patients' reports than before (see Table 1). The time by condition interaction was not significant, F (3, 152) = .278, p = .841, η_p^2 = .005, 90 % CI [0, .017], nor was the main effect of condition, F (3, 152) = .122, p = .947, η_p^2 = .002, 90 % CI [0, .001]. In view of the unintended significant group differences in age and educational degree, we added both factors as covariates to the aforementioned ANOVA. Doing so did not change the (non)significance of the aforementioned main and interaction effects, as detailed in the supplement.

Controlling for gender effects

As with the manipulation check, we also exploratorily controlled for possible gender effects by adding gender as an additional non-preregistered between-subjects factor to the ANOVA (while excluding the three participants who indicated their gender to be diverse). Doing so indicated that the main effect of time was still significant, F (1, 145) = 40.307, p < .001, η_p^2 = .218, 90 % CI [.125, .308]. The time by condition interaction was still non-significant, F (3, 145) = 1.051, p = .372, η_p^2 = .021, 90 % CI [0, .056], as was the time by gender interaction, F (1, 145) = .155, p = .694, η_p^2 = .001, 90 % CI [0, .026]. Interestingly, though, consistent with the gender differences in the manipulation check, there was a significant time by condition by gender interaction for expectation change, F (3, 145) = 3.048, p = .031, η_p^2 = .059, 90 % CI [.003, .116], indicating that in men, unlike women, the cognitive immunisation-promoting condition effectively blocked expectation change, whereas men and women did not differ in the other three experimental conditions (see Fig. 2). Specifically, only in the cognitive immunisation-promoting condition, expectation change significantly differed between men and women, F (1, 35) = 5.128, p = .029, η_p^2 =

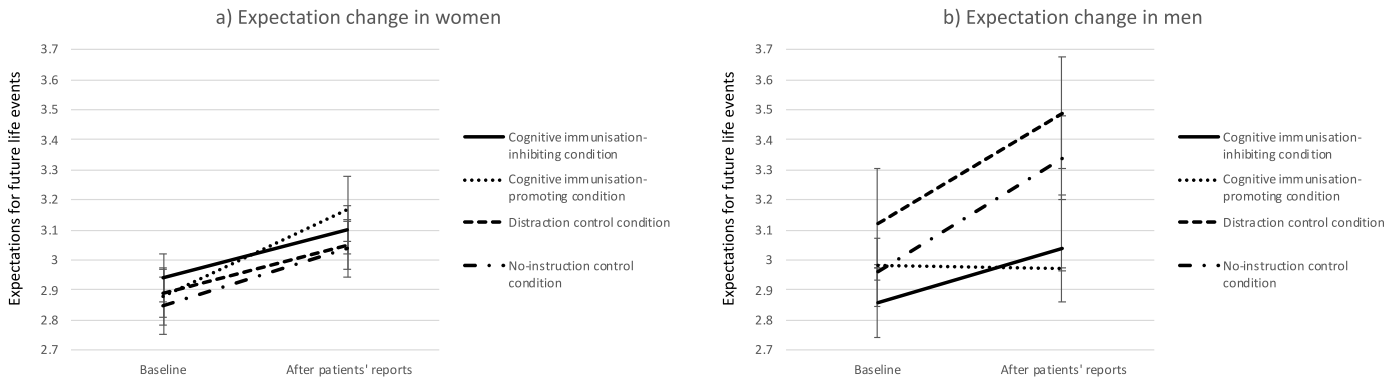


Fig. 2. Results for change in expectations for future life events separately for women (a) and men (b). The results show a significant time by condition by gender interaction, indicating that the cognitive immunisation-promoting condition effectively blocked expectation change in men, but not in women.

.130, 90 % CI [.007, .299], whereas it was not significantly different in the cognitive immunisation-inhibiting condition, F (1, 36) = .012, p = .912, η_p^2 < .001, 90 % CI [0, .028], the attention control condition, F (1, 37) = 1.769, p = .192, η_p^2 = .046, 90 % CI [0, .186], and the no-instruction control condition, F (1, 37) = 1.741, p = .195, η_p^2 = .045, 90 % CI [0, .185].

Beyond gender, we examined whether the results could have been influenced by other clinical variables, that is, antidepressant medication, depressive symptom severity, comorbid mental disorders, and the number of completed therapy sessions. As detailed in the supplement, none of these variables changed the significance of the factors from the above-mentioned 4x2 ANOVA, nor had any of these variables unique effects on change in expectations of future events.

Differentiating between expectations of positive vs. negative future life events

When distinguishing between expectations for positive vs. negative future life events, we found that overall, participants lowered their expectations of negative events more than they lifted their expectations of positive events after watching the patients' reports, F (1, 152) = 6.873, p = .010, η_p^2 = .043, 90 % CI [.006, .106]. The interaction between positive vs. negative expectations and the experimental condition was non-significant, F (3, 152) = .048, p = .986, η_p^2 = .001, 90 % CI [0, .001]. Re-running the primary analyses with negative life events only did not change the (non)significance of the factors from the ANOVA.

Secondary outcome: group differences in treatment expectations

Main analysis

The pre-registered ANOVA indicated a significant main effect of time, F (1, 152) = 65.388, p < .001, η_p^2 = .301, 90 % CI [.203, .388], reflecting that across conditions participants' treatment expectations were more positive after watching the patients' reports than before (see Table 1). The time by condition interaction was not significant, F (3, 152) = 2.095, p = .103, η_p^2 = .040, 90 % CI [0, .086], nor was the main effect of condition, F (3, 152) = 1.550, p = .204, η_p^2 = .030, 90 % CI [0, .070].[2]

Controlling for additional variables

Controlling for gender, antidepressant medication, depressive symptoms, comorbid diagnoses, and number of sessions did not change the (non)significance of the factors from the aforementioned ANOVA. None of these variables had unique effects on expectation change (all p-values >.139).

Associations between cognitive immunisation, interpretation, and recall

A high engagement in cognitive immunisation was significantly associated with more negative interpretations of the video-taped reports, r = .382, p < .001. The association with negative interpretations was particularly pronounced for the cognitive immunisation subscale referring to the authenticity of the reports, r = .531, p < .001, but the association with the subscale questioning the comparability of the report with one's own life situation was significant as well, r = .161, p = .045. By contrast, cognitive immunisation was unrelated to deficits in the recall of the contents from the video, r = −.034, p = .670, also with respect to the two subscales of the cognitive immunisation scale (see Table 2). None of these cognitive factors was significantly associated with the severity of depressive symptoms, as can be seen in Table 2, which shows all non-preregistered correlation analyses. The experimental conditions did not significantly differ in the interpretation nor the recall of the video reports, as detailed in the supplement. In the supplement, we also report the results of a regression analysis on how these three cognitive factors predict expectation change across experimental conditions.

Discussion

This pre-registered experimental study sought to extend evidence from previous research, suggesting that the devaluation of novel positive information, referred to as cognitive immunisation, is a cognitive mechanism underlying persisting negative expectations in depression (Kube et al., 2019; Kube et al., 2022; Kube et al., 2019). To this end, we modulated this proposed mechanism by either enhancing or inhibiting it, using a previously validated paradigm on the perception of other patients' reports on the positive effects of psychotherapy (Rapo et al., 2023). Overall, the results show that the current manipulation of cognitive immunisation did not lead to significant differences in expectation change, neither for expectations of future life events (i.e., the primary outcome), nor for expectations of psychotherapeutic treatment (i.e., the secondary outcome). Most likely, the non-significant differences between the experimental conditions in terms of expectation change result from the insufficiently effective manipulation. In particular, the manipulation check showed that the experimental groups differed only for one of four characters from the videos in terms of their engagement in cognitive immunisation. Thus, the current approach to have participants focus on similarities vs. differences with the acting patient in the video did not work as it failed to manipulate cognitive immunisation. Therefore, it is not surprising that the manipulation had no effects on the primary and secondary outcome either.

A number of lessons for future research can be drawn from this

[2] The (non-)significance did not change when controlling for the group differences in age and education, as detailed in the supplement. Moreover, as there was a non-significant trend for baseline differences in treatment expectations, we also controlled for this in an analysis of covariance, but this did not change the non-significance of the effects of condition either (see supplement).

Table 2
Correlations among immunisation, other cognitive factors, and depressive symptoms.

	Cognitive immunisation			Negative interpretations	Recall
	Total score	Subscale comparability	Subscale authenticity		
Cognitive immunisation					
Subscale comparability	.890***	–	–	–	–
Subscale authenticity	.501***	.050	–	–	–
Negative interpretations	.382***	.161*	.531***	–	–
Recall	−.034	.012	−.098	.069	–
Depressive symptoms	−.011	−.039	.049	−.028	.037

Note: $^{*}p < .05$, $^{***}p < .001$.

failure of the cognitive immunisation manipulation. First, the results show that participants followed the instructions of the manipulations correctly, according to their notes on the observed similarities vs. differences; further, the experimental conditions differed in their evaluation of the positive experience reports in the expected direction (albeit not significantly). This suggests that the manipulations tended to elicit the intended effect, but were too weak. To make the manipulation more effective, future research could therefore consider not only instructing participants to focus on similarities vs. differences, but also to explicitly transfer the other patients' reports to their own situation. For example, participants could be additionally instructed to reflect on what they can learn from the other patients' reports for their own future perspectives and psychotherapeutic treatment. In addition, future research might consider not to manipulate cognitive immunisation indirectly via the focusing on similarities vs. differences, but to manipulate it more directly, e.g., by manipulating the value of the patients' reports (Kube et al., 2019). In fact, another recent study using a very similar design also failed to show differences between emphasising similarities vs. differences with other patients to change attitudes towards psychotherapy (Braun-Koch et al., 2022). Hence, this indirect approach does not seem to work and it might better to directly manipulate people's perception of the content of an expectation-disconfirming information.

Second, the fact that only one of the four patient characters from the video produced significant differences in cognitive immunisation points to the necessity to carefully reflect on what patient profiles to use for such video-taped reports. The participants' qualitative comments indicate that the video of the 37-year-old female patient might have worked best because it provided the most clues for differences to the participants' own situation (e.g., single mother, financial problems, immigration history from Spain, loss of partner through death). On the other hand, using only videos from patients whose life situation is quite different from that of most people in the sample would have the disadvantage that the selection of characters is less representative for people suffering from MDD.

Third, our results suggest that possible gender effects might be considered more carefully. In particular, we found that the cognitive immunisation-promoting manipulation was more effective in men than in women. The simplest explanation of this effect is that it was easier for men to engage in cognitive immunisation because three of the four characters from the videos were women. Alternatively, it is conceivable that men are in general more hesitant to change their expectations in response to specific instructions, as previous research has shown that men rather than women show psychological reactance when they feel pushed into certain actions (Kube et al., 2024; McCright & Dunlap, 2011; Wullenkord & Reese, 2021). Yet, given the exploratory nature of the current analyses on gender differences, these effects need to be replicated in future hypothesis-testing studies to assess their robustness.

The weak effects of the manipulation could also result from the variance in the actual similarity between the participants and the characters from the video being more significant than whether participants focused on similarities vs. differences. This importance could have made it difficult for the manipulation to be effective. To minimise this problem of variance in actual similarity, future research might consider not giving any information about the sociodemographic characteristics of the persons in the video, but having them talk only about the characteristics of their depressive disorder and their treatment of it.

Hence, the present study could not further corroborate evidence regarding the influence of cognitive immunisation on persisting negative expectations in depression (Kube et al., 2020; Rief & Joormann, 2019), which prevents us from drawing more detailed conclusions regarding the role of cognitive immunisation in biased belief updating in depression (Kube, 2023).

When examining the associations of cognitive immunisation with other cognitive factors, we found that cognitive immunisation was significantly associated with more negative interpretations of the video-taped patients' reports, but not with a deficient recall of it. This investigation of different cognitive factors in relation to one another is important given the combined cognitive bias hypothesis in depression, which proposes that cognitive biases in depression are not independent from each other, but can interact (Everaert et al., 2012, 2014). In this regard, our finding that cognitive immunisation was significantly associated with more negative interpretations of the other patients' reports adds to previous research, which found cognitive immunisation and interpretation biases to be unrelated in the context of performance feedback in a non-clinical sample (Würtz et al., 2024).

The finding that none of the cognitive factors was associated with depressive symptom severity is a bit surprising because previous research did link all of these factors to depression (Everaert et al., 2018; Gotlib et al., 2011; Kube et al., 2019). One explanation of this might be that we examined solely a clinical sample and the importance of these factors emerges only in either more heterogeneous samples or direct comparisons of people with MDD and healthy control participants. Another possible explanation, at least for interpretation and recall, is that the measures used in this study were not ideal to identify associations with depressive symptoms. In fact, previous research on interpretation biases and memory biases in depression used more sophisticated measures than the present study (Deng et al., 2022; Everaert et al., 2014; Würtz et al., 2022).

From a clinical perspective, it is encouraging that, across experimental conditions, participants lifted both their expectations of future events and their expectations of psychotherapy in response to the other patients' video reports, according to the significant main effects of time. This is encouraging as it suggests that having patients with MDD watch videos of other patients reporting the positive effects of psychotherapy prior to their own therapy could be an effective strategy to improve their treatment expectations. This is important since treatment expectations have been shown to be an important predictor of psychotherapy outcomes (Greenberg et al., 2006; Rief et al., 2022). Thus, the present study adds to recent research investigating how expectations of psychotherapeutic treatment can be enhanced (Braun-Koch & Rief, 2022; Seewald & Rief, 2023). In this context, we want to emphasise that according to our results, it seems to be easier to revise negative expectations than to increase positive expectations. Thus, presenting positive experience reports to people with MDD may be effective in reducing negative expectations prior to psychotherapy, but this does not automatically lead to the simultaneous formation of positive expectations, which may

require additional effort. To this end, it may be useful to train patients in making optimistic predictions (Miranda et al., 2017) and visualising positive outcomes (Kube et al., 2019). However, as all participants in this sample were seeking help and about to begin their psychotherapy, they may have been open to information suggesting that they could be optimistic about the outcome of treatment. People who do not seek help, on the other hand, may be less open to positive video reports of other patients.

Strengths and limitations

The study used a relatively large clinical sample with sophisticated diagnostic procedures, which allowed an appropriate empirical test of the hypothesis. In addition, the use of manipulation checks and the analysis of participants' qualitative responses to the manipulation's instructions enabled us to properly evaluate the effects of the manipulation. An additional advantage of the experimental design is the use of an active control group (i.e., the distraction control group) in addition to a no-instruction control group. Further strengths of the present study are the pre-registration, the consideration of different cognitive factors, and the consideration of several potentially confounding clinical variables (i.e., antidepressant medication, comorbid diagnoses, number of treatment sessions).

A limitation is that we did not examine a healthy control sample. We did not do so because previous research had already established that depression is related to difficulties in using novel positive information to revise negative beliefs (Deng et al., 2022; Everaert et al., 2018; Kube et al., 2019) and had suggested that the engagement in cognitive immunisation against novel positive information occurs in people with depression, but not in healthy people (Kube and Glombiewski, 2021, 2022; Kube et al., 2019). Nevertheless, we note that it would have been valuable also to investigate whether people with MDD differ from other people in terms of their responses to the different experimental instructions.

Regarding the manipulation of cognitive immunisation, it should be critically noted that we manipulated it solely by increasing vs. lowering the perceived similarity between participants and the characters from the videos. This approach can be criticised for two reasons: first, cognitive immunisation also involves additional cognitive processes, such as considering a positive information to be an exception (Panitz et al., 2021; Rief et al., 2015), which could also have been addressed in a manipulation. Second, one might argue that instructing participants to focus on similarities and differences with the characters from the video are just two sides of the same coin, in the sense that focusing on similarities automatically makes people aware of differences and vice versa. However, if that was true, we should have found that both the cognitive immunisation-promoting and the -inhibiting condition were above or below the control conditions. In fact, the descriptive values indicate that the cognitive immunisation-promoting condition somewhat enhanced the engagement in cognitive immunisation, whereas the cognitive immunisation-inhibiting condition somewhat lowered it (although not significantly). Moreover, the fact that participants across conditions lifted their expectations from baseline to after watching the videos might be due to an additional unmeasured variable that acted as a cognitive immunisation inhibitor. An additional limitation is that we did not assess the level of anhedonia in the sample. This may have been important, as it is conceivable that anhedonia might moderate the responsiveness of people with major depression to such manipulations of cognitive immunisation.

Conclusions

This study shows that people with depression's expectations of future life events and their expectations of psychotherapeutic treatment improve when they watch video recordings of other patients reporting on how psychotherapy helped them overcome their problems. However, the experimental manipulation of the evaluation of these positive reports failed, as indicated by the non-significant differences between the experimental conditions in expectation change in the entire sample. Only in men there were significant differences between the conditions, with the cognitive immunisation-promoting condition preventing participants from adjusting their expectations. Thus, the present study pointed to some important challenges which future research must consider when aiming to further investigate the role of cognitive immunisation in the persistence of negative expectations in depression.

CRediT authorship contribution statement

Tobias Kube: Writing – review & editing, Writing – original draft, Visualization, Validation, Supervision, Software, Resources, Project administration, Methodology, Investigation, Funding acquisition, Formal analysis, Data curation, Conceptualization. **Edith Rapo:** Writing – review & editing, Project administration, Investigation, Data curation. **Julia A. Glombiewski:** Writing – review & editing, Supervision, Resources, Conceptualization. **Winfried Rief:** Writing – review & editing, Supervision, Funding acquisition, Conceptualization.

Declaration of competing interest

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Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.brat.2025.104736.

Data availability

Data will be made available on request.

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Anhang C: Artikel 3

Psychological Medicine

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Differences between persistent and episodic depression in processing novel positive information

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Abstract

Background. Research has pointed to important psychopathological differences between persistent and episodic depressive disorders. Here, we tested the hypothesis that people with persistent rather than episodic depression have difficulty revising established expectations in response to novel positive information. In terms of underlying mechanisms, we predicted that these differences between the two subtypes would be related to the engagement in cognitive immunization (i.e. devaluing expectation-disconfirming positive information).

Methods. Prior to their psychotherapeutic treatment, 54 outpatients with persistent depressive disorder and 102 outpatients with episodic major depressive disorder completed an experimental task. In this task, participants watched other patients' reports of positive effects of psychotherapy. Our primary outcome was change in treatment expectations from before to after watching the positive reports.

Results. Overall, people with persistent depression had lower treatment expectations than people with episodic depression. In addition, they changed their treatment expectations less in response to other patients' positive reports. This effect was greater for psychotherapy outcome expectations than for role expectations. The lack of expectation change in persistent depression relative to episodic depression was particularly pronounced in a cognitive immunization-promoting experimental condition.

Conclusions. The results indicate that people with persistent depression have difficulty adjusting their treatment expectations in response to positive information on psychotherapy. This may be a risk factor for poor treatment outcome. The results regarding cognitive immunization suggest that for people with persistent depression, slight doubts about the value of information on the positive effects of psychotherapy may be sufficient to prevent them from integrating this information.

Introduction

In around 20–30% of people who suffer from a major depressive disorder, the symptoms are chronic (Angst, Gamma, Rössler, Ajdacic, & Klein, 2009; Gilmer et al., 2005; Murphy & Byrne, 2012), that is, they persist for at least 2 years. Since the DSM-5, this chronic course of depression has been classified as 'persistent depressive disorder' (PDD) (APA, 2013), which is distinguished from non-persistent forms of depression, which have a more episodic course. The latter includes the former diagnoses of a major depressive episode and recurrent major depressive disorder, hereafter referred to as episodic depression. Research has shown that people with persistent depressive disorder, hereafter referred to as persistent depression, are less likely to benefit from psychotherapy (Thase, Reynolds, Frank, & Simons, 1994) and pharmacotherapy (Howland, 1991) than people with episodic depression. In addition, people with persistent depression have a higher hospitalization rate and a lower level of functioning, which also causes higher costs for the healthcare system (Gilmer et al., 2005; Klein, Schwartz, Rose, & Leader, 2000; Luppa, Heinrich, Angermeyer, König, & Riedel-Heller, 2007). Given this worse prognosis for people with persistent depression, it is vital to understand the psychopathological factors that underlie the poorer response to available treatments.

Research has shown that there are indeed important psychopathological differences between persistent and episodic depression. For example, the two subtypes showed qualitatively different symptom trajectories over a period of 10 years (Klein & Kotov, 2016). Furthermore, people with persistent depression, as compared to people with episodic depression, more often have dysfunctional cognitions (Riso, Du Toit, & Blandino, 2003), have more difficulty to express their own

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emotions (van Randenborgh et al., 2012), and show a higher degree of emotional, cognitive, and behavioral avoidance (Brockmeyer, Kulessa, Hautzinger, Bents, & Backenstrass, 2015).

Based on these differences between the two subtypes of depression, we sought to further investigate factors that may have the potential to explain why patients with persistent depression respond less to treatments than patients with episodic depression. To this end, we focused on whether the two subtypes of depression differ in how they use novel positive information to alter established expectations. This interest draws from recent research that has demonstrated that depression in general is associated with a reduced update of negative beliefs by novel positive information (Everaert, Bronstein, Cannon, & Joormann, 2018; Korn, Sharot, Walter, Heekeren, & Dolan, 2014; Kube, Rief, Gollwitzer, Gärtner, & Glombiewski, 2019). Furthermore, it has been proposed that an important mechanism that may underlie the persistence of negative expectations is the cognitive devaluation of novel positive information, for example, through questioning the information's validity, referred to as cognitive immunization (Kube, Schwarting, Rozenkrantz, Glombiewski, & Rief, 2020; Rief & Joormann, 2019). Preliminary empirical evidence supports this suggestion, as research has shown that the degree to which people with depression engage in a devaluation of novel positive information determines how much they alter their expectations in response to positive information (Kube et al., 2019; Kube, Rief, Gollwitzer, et al., 2019).

Following previous theoretical considerations (Barrett, Quigley, & Hamilton, 2016; Kube et al., 2020; Rief & Joormann, 2019), we hypothesize that the persistence of negative expectations and the engagement in cognitive immunization is more pronounced in people with persistent depression than in people with episodic depression. In doing so, we distinguish between expectations of psychotherapeutic treatment (e.g. 'Psychotherapy will help me overcome my problems') and expectations that refer to future life events (e.g. 'Nothing positive will happen to me'). With regard to the former, we predict the treatment expectations of people with persistent depression, relative to those of people with episodic depression, to be more resistant to change because they more often experienced treatment failures in the past (Howland, 1991; Klein et al., 1999; Thase et al., 1994). Therefore, they may have more reason to doubt positive information on psychotherapy and engage in cognitive immunization, accordingly. With respect to expectations of future life, we expect the differences between the two subtypes of depression to be smaller, yet we predict the degree of expectation change still to be lower in people with persistent depression than in in people with episodic depression. We believe so because previous research has suggested that there is more pronounced avoidance behavior and social withdrawal in people with persistent depression (Brockmeyer et al., 2015; Jäger & Brakemeier, 2014; McCullough, 2003), and this lack of exploring might make their expectations more immune to change as they are less often challenged by disconfirming experiences.

In our view, focusing on (the lack of) expectation change and the cognitive processes that underlie it is promising to understand why people with persistent depression respond less to psychotherapy than people with episodic depression, because many psychotherapeutic interventions quite heavily rely on providing patients with novel positive experiences, such as behavioral experiments, behavioral activation, or emotion regulation (Dimidjian et al., 2006; Dobson & Hamilton, 2003; Rief & Glombiewski, 2016). If people with persistent depression had more difficulty than people with episodic depression in accepting and integrating novel positive experiences, this would explain why they benefit less from psychotherapeutic treatments, as experiential learning is a central component of most psychotherapeutic interventions (Craske, Treanor, Conway, Zbozinek, & Vervliet, 2014; Kube, Glombiewski, & Rief, 2019; Rief et al., 2022).

Accordingly, the present research aimed to test two hypotheses: first, that people with persistent depression adjust their expectations of psychotherapeutic treatment less than people with episodic depression in response to positive information on psychotherapy; and second, that people with persistent depression alter expectations of future life events less than people with episodic depression. These hypotheses were examined in an experimental study in which participants watched video recordings of other patients who reported on how they benefitted from psychotherapy. Moreover, we investigated whether the two subtypes of depression also differed in their engagement in cognitive immunization against positive information on psychotherapy, as well as other cognitive factors, namely, negative interpretations of positive information and deficient recall of it. These factors were chosen because negative interpretation bias (Everaert, Podina, & Koster, 2017) and deficient recall of positive information (Ellwart, Rinck, & Becker, 2003; Gotlib, Jonides, Buschkuehl, & Joormann, 2011) have been shown to be prevalent in depression, and we aimed to examine their importance in episodic versus persistent depression.

Methods

This study is part of a larger research project, which sought to examine the role of cognitive immunization in expectation change in depression. The results of this manipulation irrespective of depression subtype are described elsewhere in detail (Kube, Rapo, Glombiewski, & Rief, 2025). In this article, we will focus on whether people with persistent depression responded differently to this manipulation than people with episodic depression. No further articles are planned using this data set. Participants from this study did not take part in any additional experiment.

Ethics

The study was approved by the local ethics committee of the Department of Psychology at the university where the study was conducted (reference number LEK-190_2019). It was conducted in accordance with ethical standards as laid down in the 1964 Declaration of Helsinki and its later amendments. All participants gave written informed consent.

Transparency and openness

The hypotheses, methods, and the analysis plan of the umbrella project were pre-registered (https://aspredicted.org/65B_3L2) on July 21, 2021, prior to data collection which began on August 11, 2021. In terms of openly sharing the data and the analysis code, we opted against fully sharing it through data repositories after extensive discussions for the following reason. We worried that highly potent data-analytic algorithms could be able to de-anonymize the patients' identity with a certain probability when taking into account that it is publicly known where the study was conducted and, accordingly, in which geographical area the patients live, and which mental disorder was confirmed. Yet, the data and the analysis code will be made available to other researchers upon reasonable request.

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Participants

Participants were recruited between August 2021 and April 2024 from a German university outpatient clinic and several private psychotherapy practices in the surrounding. The key inclusion criterion was meeting the criteria of a major depressive disorder (ICD-10: F32.0-F32.2, F33.0-F33.2) or dysthymia (F34.1) as the primary diagnosis, as ascertained by a structured clinical interview. The Structured Clinical Interview for DSM-5 (SCID) was used in 94.2% of all cases to determine the diagnosis (Beesdo-Baum, Zaudig, & Wittchen, 2019). Notably, the SCID for DSM-5 allows to distinguish between persistent depressive disorder and episodic major depression. In 4.5% of the participants, the German 'Diagnostisches Kurz-Interview bei psychischen Störungen' (Mini-DIPS) was used as the diagnostic interview (Margraf, 1994). Since the Mini-DIPS does not distinguish between persistent and episodic depression according to DSM-5, it was followed by an additional interview that was specifically developed to assess whether people meet the criteria of a persistent depressive disorder (Klein, Backenstraß, & Schramm, 2018). In two patients (1.3%), another unspecified clinical interview was conducted, which too was followed by the interview for persistent depressive disorder. The diagnostic interviews were conducted by psychotherapists in training under the supervision of a licensed psychotherapist or by psychology master students, who were specifically trained in the SCID and supervised by a licensed psychotherapist. Further inclusion criteria were: patients had to be still in the diagnostic phase or at the very beginning of their psychotherapy (no more than 5 sessions); be at least 18 years old; and be fluent in German. Exclusion criteria were: psychotic symptoms and bipolar affective disorder. For their participation, participants received financial compensation (15 EUR). A total of 161 patients were included, of whom 156 could be included for the final analyses (see the supplementary material for a detailed description of the exclusions). This sample size was above the minimum sample size of $N = 149$, which was required according to the preregistered a-priori power analysis (expected effect size: $f = 0.275$; power = .80; $\alpha = .05$; groups: 4; numerator df: 3).

According to the DSM-5 criteria, 65.4% met the criteria of an episodic major depression, and 34.6% met the criteria of a persistent depressive disorder. In terms of comorbidities, 37.8% had at least one comorbid mental disorder, and 12.2% had two comorbid diagnoses. The most frequent comorbid diagnoses were social anxiety disorder (10.3%), generalized anxiety disorder (7.7%), substance use disorder (5.1%), somatoform disorder (3.2%), panic disorder (2.6%), posttraumatic stress disorder (1.3%), obsessive-compulsive disorder (0.6%), hyperkinetic disorder (0.6%), and attention-deficit hyperactivity disorder (0.6%), and other anxiety disorders (4.5%). The mean BDI-II score in this sample was 28.78 (SD = 9.79), reflecting moderate to severe depressive symptoms (Beck, Steer, Ball, & Ranieri, 1996). About one third (32.7%) of the sample took antidepressant medication, of which Sertraline (7.7%) was the most frequently used antidepressant, followed by Escitalopram (5.1%) and Citalopram (3.2%). The other 67.3% did not take any psychopharmacological medication.

In terms of sociodemographic variables, participants' age was between 18 to 70 years ($M = 34.72$, $SD = 13.28$), 67.3% reported to be female, 30.8% male, and three persons (1.9%) reported their gender to be diverse. As the highest educational degree, 39.2% had the school leaving examination (German 'Abitur' or 'Fachabitur'), 30.8% had primary education, 21.8% had a university degree, 1.9% were still at school, and 6.4% had other educational degrees. In terms of employment status, 44.9% were employees, 22.4% were students, 6.4% were unemployed, 5.8% were in training, 2.6% were self-employed, 1.9% were still at school, 1.3% were civil servants, and 14.7% reported to have another status (e.g. being on parental leave, disabled, homemaker).

Of note, we deliberately did not examine a healthy control sample since previous research has repeatedly shown that depression is related to difficulties in using novel positive information to update negative beliefs (Deng et al., 2022; Everaert et al., 2018; Kube, Rief, Gollwitzer, et al., 2019). The engagement in cognitive immunization against novel positive information appears to specific to people with depression but does not occur in healthy people (Kube & Glombiewski, 2021, Kube & Glombiewski, 2022; Kube, Glombiewski, Gall, et al., 2019). In addition, the investigation of change in psychotherapy expectations might be perceived as odd by people who are mentally healthy and not seeking psychotherapeutic help.

Procedure and stimuli

At the beginning, participants indicated their baseline expectations of psychotherapeutic treatment as well as their baseline expectations of future life events. Next, they were presented with videos from four patients, who were in fact amateur actors, as developed and validated by Rapo, Rief, and Kube (2023) (In the previous study by Rapo et al. (2023), we originally used videos of 5 characters including a man of about 30 years. In this pretest, however, participants fed back that they perceived the study as lasting very long and they recommended removing one character to shorten the duration of the study. We took this feedback seriously because the sample from this pretest was a sample of patients with major depression as well, and so our intention was to lower the burden related to participating in the study given the frequently reported problems concentrating in people with major depression. The video of the young man was removed based on the data from the pretest as it was perceived as being least suitable). Each of these four patients first reported on their symptoms and their current life situation at the beginning of their psychotherapy before reporting in another video from the end of their treatment on how psychotherapy helped them overcome these problems. The four patients shown in the videos varied with regard to a number of clinical variables to cover some of the most important manifestations of depression: character 1: anhedonia, along with problems concentrating, feelings of worthlessness, and suicidal ideation; character 2: depression with intense somatic symptoms such as headache, muscle tension, insomnia, and fatigue; character 3: seasonal recurrent depression with listlessness, social withdrawal, and changes in appetite; character 4: chronic depression with a pronounced loss of interest, psychomotor retardation, and escapism. Furthermore, the characters varied in terms of sociodemographic variables, such as age (25–61 years), gender (three female actresses versus one male actor), occupation (student versus employee versus pensioner versus civil service), family status (in a couple relationship versus single mum versus married versus divorced), and immigration history (one person with versus three persons without immigration history). All participants watched all videos and the order in which they were presented was randomized. Specifically, participants were presented with the first video of a randomly selected character before watching the second video of this character. Subsequently, they were randomly presented with the first video of another character, before watching its second video, and so forth. The videos from the beginning of treatment were between 2:30 and 5:01 minutes long, and the videos from the end of treatment had a length of

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between 2:07 and 4:10 minutes. In the supplementary material, we present the full list of details regarding the four characters and their reports (see Supplementary Table S1).

Experimental conditions

In the cognitive immunization-inhibiting condition, participants were instructed to focus on similarities between themselves and the characters from the videos. This was supposed to make it difficult for participants to disregard the persons from the videos' positive experiences with undergoing psychotherapy. To check whether participants actually followed that instruction, they were asked to note similarities they identified in an open text field. Participants from the cognitive immunization-promoting condition, on the other hand, were instructed to focus on and note down differences between themselves and the characters from the video. This was supposed to ease the engagement in cognitive immunization because paying attention to differences in the characters from the video may prompt the belief that their situations are hardly comparable, such that participants may think that they may not benefit from psychotherapy as much as the persons from the videos did.

In the distraction control group, participants were instructed to focus on the physical appearance of the person in the video and noted these aspects in open text fields, accordingly. This condition was used as an active control group to be able to test whether really the content of the cognitive immunization manipulation – and not just any unspecific instruction which interrupts the procedure – makes a difference to expectation change. Finally, the no-instruction control group did not receive any instruction before watching either of the videos. Further details of the experimental manipulations and their reasoning are reported elsewhere (Kube et al., 2025).

Measures

Expectations for psychotherapeutic treatment

Participants' expectations of psychotherapeutic treatment were assessed using the 'Milwaukee Psychotherapy Expectation Questionnaire' (MPEQ) by Norberg, Wetterneck, Sass, and Kanter (2011). The MPEQ comprises 13 items, which relate to two factors: role expectations (e.g. 'I expect my therapist will provide support') and outcome expectations (e.g. 'After therapy, I will be a much more optimistic person'). The items are rated on an 11-point scale from 0 (= 'not at all') to 10 (= 'very much so') and we report the arithmetic mean of the MPEQ, which can range between 0 and 10, accordingly. In the present study, Cronbach's alpha of the MPEQ was $\alpha = .83$ at baseline and $\alpha = .86$ after watching the videos.

Expectations of future life events

We used the Future Event Questionnaire (FEQ) by Miranda and Mennin (2007) to assess participants' expectations of experiencing positive and negative life events. In the instruction of the FEQ, participants received the following information: 'For each of the following events, please rate how likely you think it is that you will experience it at some point in the future'. Next, participants were presented with 17 positive (e.g. 'Having a successful career') and 17 negative future events (e.g. 'Get the blame for something going wrong'), which cover a range of important life domains, such as social relationships, occupation, and finance. Participants' task was to indicate the likelihood of each event to happen to them on a five-point Likert scale ranging from 1 ('not at all likely') to 5 ('very likely'). To compute the FEQ mean score (ranging from 1 to 5), participants' ratings for the negative events are reversely scored, such that a high FEQ score reflects positive future expectations. Cronbach's α of the FEQ was .90 at baseline and .93 after watching the videos.

Cognitive immunization

We used the previously developed 'Cognitive Immunisation Against Other People's Experiences' (CIA-OPE) scale (Rapo et al., 2023) to assess whether participants engage in cognitive immunization against the other patients' reports. The 5-item scale used in the present study comprises three items that assess whether participants question the comparability of their own situation and that of the characters from the videos (e.g. 'The problems the person mentioned in the video apply to me as well'). Another two items assess whether participants question the reports' credibility and authenticity (e.g. 'The report of this person is authentic'). The items of the CIA-OPE were assessed after the second video of each of the four characters and were rated on a 7-point Likert-scale from 1 ('totally disagree') to 7 ('totally agree'). For all four characters, Cronbach's alpha was $\alpha = .83$. For the sub-items referring to the comparability of participants' own situation and the person from the video, Cronbach's alpha was $\alpha_{comparability} = .85$ and for the items referring to the credibility of the reports, it was $\alpha_{credibility} = .90$.

Interpretations

We also assessed whether participants had the propensity to interpret the video reports negatively, using a 7-item scale developed previously (Rapo et al., 2023). With this scale, we assessed whether participants interpreted the patients' reports as an indication of how psychotherapy improved their mood and their life situation – or whether they were inclined to interpret the patients' reports more negatively (e.g. 'The person made the impression that they still felt depressed after the therapy'). The items were rated on a 7-point Likert scale from 1 ('totally disagree') to 7 ('totally agree'). Cronbach's alpha across all four characters was $\alpha = .91$.

Recall

In addition, we assessed whether participants correctly recalled the contents from the videos. To this end, they were presented with five statements for each of the four characters (resulting in a total of 20 statements), some of which were correct, meaning that they corresponded to something the person from the video stated, whereas other statements were incorrect. The total score for all four characters can range from 0 to 20, with a value of 20 reflecting that there was not any error in recall.

Depressive symptoms

Depressive symptoms were assessed using the second edition of the Beck's Depression Inventory (BDI-II), which includes 21 items assessing depressive symptoms on a 4-point scale ranging from 0 to 3 (Beck et al., 1996). The sum score ranges between 0 and 63, and lower values indicate fewer depressive symptoms.

Statistical analyses

Because participants could only continue with the survey if they entered all values, there were no missing values for the experimental sessions. Data screening was conducted according to the recommendations of Tabachnick and Fidell (2019). For the main analysis, we performed a time (2: before versus after watching the other patients' reports) by diagnosis (persistent versus episodic depression) repeated-measures analysis of variance (ANOVA) using participants' treatment expectations (MPEQ) as the dependent variable. A similar ANOVA was performed to examine whether

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the two subtypes of depression differ in changing their expectations of future life events. Type-I error levels were set at 5%. All analyses were performed using SPSS version 29.

Results

Differences between persistent and episodic depression in sociodemographic, clinical, and baseline study variables

Participants with persistent depression did not significantly differ from participants with episodic depression in terms of age, $t(96.458) = -1.370$, $p = .174$, $d = -0.240$, 95% CI [−0.571, .091], gender distribution, $\chi^2(2) = 5.052$, $p = .080$, educational degrees, $\chi^2(7) = 7.346$, $p = .394$, employment status, $\chi^2(7) = 3.318$, $p = .854$, and German as the native language, $\chi^2(1) = 2.958$, $p = .085$.

In terms of clinical variables, the two subtypes of depression did not differ in their BDI-II scores, $t(154) = -0.356$, $p = .722$, $d = -0.060$, 95% CI [−0.390, .270] and the presence of comorbid secondary diagnoses, $\chi^2(11) = 11.943$, $p = .368$. However, people with persistent depression significantly differed from people with episodic depression in the distribution of tertiary comorbid diagnoses, $\chi^2(8) = 19.538$, $p = .012$: participants with persistent depression more frequently met the criteria of generalized anxiety disorder as the tertiary diagnosis (5 versus 0 cases), whereas participants with episodic depression more frequently met the criteria of other anxiety disorders as the tertiary diagnosis (0 versus 5 cases). The percentage of participants who met the criteria of any tertiary diagnosis was not significantly different between episodic (16.7%) and persistent depression (9.8%), though, $\chi^2(1) = 1.555$, $p = .212$ (see Table 1). The two subtypes of depression did not significantly differ in the intake of antidepressant medication either, $\chi^2(1) = 0.708$, $p = .400$.

In terms of baseline study variables, participants with persistent depression did not differ from participants with episodic depression in baseline expectations of future life events, $t(154) = 0.943$, $p = .347$, $d = 0.159$, 95% CI [−0.172, 0.489]. However, people with persistent depression had significantly less positive treatment expectations than people with episodic depression, $t(154) = 2.318$, $p = .022$, $d = 0.390$, 95% CI [0.057, 0.719], reflecting a small to medium effect. Table 1 presents all sociodemographic, clinical, and baseline study data of patient with persistent versus episodic depression.

Differences between persistent and episodic depression in change of treatment expectations

There was a significant time by diagnosis interaction, $F(1, 154) = 5.716$, $p = .018$, $\eta_p^2 = .036$, 90% CI [.003, .095], indicating that people with persistent depression ($M = 0.22$, $SD = 0.57$) adjusted their expectations less than people with episodic depression ($M = 0.46$, $SD = 0.59$), as illustrated in Figure 1. This reflects a small to medium effect, $d = 0.402$, 95% CI [0.069, 0.735]. This effect also remained significant when controlling for the severity of depressive symptoms (BDI-II sum scores) as a covariate, $F(1, 153) = 5.625$, $p = .019$, $\eta_p^2 = .035$, 90% CI [.003, .095]. When distinguishing between role expectations and outcome expectations (i.e. the two factors of the MPEQ), we found that the time by diagnosis interaction was significant particularly for change in outcome expectations, $F(1, 154) = 6.935$, $p = .009$, $\eta_p^2 = .043$, 90% CI [.006, .106], whereas it was not significant for change in role expectations, $F(1, 154) = 1.553$, $p = .215$, $\eta_p^2 = .010$, 90% CI [0, .051]. With respect to the latter, however, there was a significant main effect of diagnosis, $F(1, 154) = 15.192$, $p < .001$, $\eta_p^2 = .090$, 90% CI [.030, .166], indicating that people with persistent depression had significantly lower role expectations than people with episodic depression (reflecting a medium effect, $d = 0.603$).

When adding the experimental condition (focusing on differences versus similarities of participants acting patients) as another between-subjects factor, the time by diagnosis interaction remained significant ($p = .022$). In addition, there was a significant diagnosis by condition interaction, $F(3, 148) = 3.010$, $p = .032$, $\eta_p^2 = .057$, 90% CI [.003, .113] (Again, this effect remained significant when controlling for the severity of depressive symptoms, $F(3, 147) = 3.000$, $p = .033$, $\eta_p^2 = .058$, 90% CI [.003, .113]). Post-hoc tests showed that only in the cognitive immunization-promoting condition, participants with persistent depression showed significantly less expectation change than participants with episodic depression, $t(37) = 2.271$, $p = .029$, $d = 0.833$, 95% CI [0.084, 1.571], reflecting a large effect, whereas the two subtypes of depression did not differ in expectation change in the other experimental conditions (all p-values > .290), as depicted in Figure 2. The time by diagnosis by condition interaction was not significant, $F(3, 148) = 1.643$, $p = .182$, $\eta_p^2 = .032$, 90% CI [0, .075].

Differences between persistent and episodic depression in expectations of future life events

The ANOVA indicated that the time by diagnosis interaction was not significant, $F(1, 154) = 2.165$, $p = .143$, $\eta_p^2 = .014$, 90% CI [0, .059]. The main effect of diagnosis was not significant either, $F(1, 154) = 2.214$, $p = .139$, $\eta_p^2 = .014$, 90% CI [0, .059]. However, there was a significant main effect of time, $F(1, 154) = 36.352$, $p < .001$, $\eta_p^2 = .191$, 90% CI [.105, .278], indicating that overall, participants' treatment expectations were more positive after watching the other patients' reports ($M = 3.12$, $SD = 0.60$) than before ($M = 2.91$, $SD = 0.51$), see Figure 3.

When adding the experimental condition as another between-subjects factor, the time by diagnosis by condition interaction was not significant, $F(3, 148) = 1.285$, $p = .282$, $\eta_p^2 = .025$, 90% CI [0, .064].

Differences between persistent and episodic depression in cognitive factors

People with persistent and episodic depression did not significantly differ in cognitive immunization, $t(154) = 0.334$, $p = .739$, $d = 0.056$, 95% CI [−0.274, 0.386], neither with respect to questioning the comparability, $t(154) = 0.920$, $p = .359$, $d = 0.155$, 95% CI [−0.176, 0.485], nor with respect to questioning the authenticity of the characters' situations, $t(154) = -1.010$, $p = .314$, $d = -0.170$, 95% CI [−0.500, 0.161]. They did not significantly differ in their endorsement of negative interpretations, $t(154) = -0.969$, $p = .334$, $d = -0.163$, 95% CI [−0.493, 0.168], and deficient recall either, $t(154) = -0.888$, $p = .376$, $d = -0.149$, 95% CI [−0.479, .181].

Discussion

In view of evidence suggesting that people with persistent depression respond less to available treatments than people with episodic depression (Keller & Boland, 1998; Kocsis, 2003), the present research sought to investigate differences between the two subtypes of depression in terms of their psychopathology. Specifically, we examined whether people with persistent depression differ from

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Table 1. Differences between persistent and episodic depression in sociodemographic, clinical, and baseline study variables

Variable	Persistent depressive disorder (n = 54)	Episodic major depression (n = 102)	Significant differences
Age, M (SD)	36.80 (14.38)	33.62 (12.60)	p = .174, d = −0.240
Gender, N (%)			$\chi^2(2) = 5.052$, p = .080
Male	22 (40.7%)	26 (25.4%)	
Female	32 (59.3%)	73 (71.6%)	
Diverse	0	3 (2.9%)	
Education level, N (%)			$\chi^2(7) = 7.346$, p = .394
Primary education	16 (29.6%)	35 (34.3%)	
School leaving examination	23 (42.6%)	38 (37.2%)	
University degree	10 (18.5%)	24 (23.5%)	
Other	5 (9.3%)	5 (4.9%)	
Employment status, N (%)			$\chi^2(7) = 3.318$, p = .854
At school	0	3 (2.9%)	
In training	3 (5.6%)	6 (5.8%)	
University student	12 (22.2%)	23 (22.5%)	
Employed	26 (48.1%)	44 (43.1%)	
Self-employed	1 (1.9%)	3 (2.9%)	
Civil servant	0	2 (2.0%)	
Unemployed	3 (5.6%)	7 (6.9%)	
Other	9 (16.7%)	14 (13.7%)	
BDI-II sum score, M (SD)	29.17 (11.46)	28.58 (8.83)	p = .722, d = −0.060
Comorbid secondary diagnosis, N (%)			$\chi^2(1) = 0.299$, p = .584
any	22 (40.7%)	37 (36.3%)	
none	32 (59.3%)	65 (63.7%)	
Comorbid tertiary diagnosis, N (%)			$\chi^2(1) = 1.555$, p = .212
Any	9 (16.7%)	10 (9.8%)	
None	45 (83.3%)	92 (90.2%)	
Antidepressant medication, N (%)			$\chi^2(1) = 0.708$, p = .400
Yes	20 (37.0%)	31 (30.3%)	
No	34 (63.0%)	71 (69.7%)	
FEQ T1, M (SD)	2.86 (0.50)	2.94 (0.51)	p = .347, d = 0.159
MPEQ T1, M (SD)	7.94 (1.09)	8.33 (0.95)	p = .022, d = 0.390

Note: N, number; M, mean; SD, standard deviation; BDI-II, Beck's Depression Inventory Revised; FEQ, Future Event Questionnaire; MPEQ, Milwaukee Psychotherapy Expectation Questionnaire; T1, baseline assessment. Note that here we present the data for the presence of any (versus none) secondary or tertiary diagnosis, whereas the main text presents differences in the frequency distribution for all specific diagnoses, which is why the statistical information differs between main text and this table.

people with episodic depression in the extent to which they use novel positive information to adjust treatment expectations and expectations of future life events in response to positive information on psychotherapy. The results show that patients with persistent depression had not only overall lower treatment expectations than patients with episodic depression, but their treatment expectations were also more resistant to change. This was particularly pertinent in expectations regarding the outcomes of psychotherapy, indicating that participants with persistent depression showed less change in their expectations of improvement through psychotherapy than participants with episodic depression. By contrast, the two subtypes did not differ in changing role expectations, although here again people with persistent depression had overall lower expectations. The results also show that the lacking update of treatment expectations in people with persistent depression was particularly pronounced in the cognitive immunization-promoting condition. Contrary to treatment expectations, the two subtypes of depression did not differ in their update of expectations of future life events.

The finding that treatment expectations are more resistant to change in patients with persistent depression than in patients with episodic depression is interesting and relevant, in view of research showing that low treatment expectations are a risk factor of not benefitting from psychotherapy (Constantino, Vîslă, Coyne, & Boswell, 2018; Greenberg, Constantino, & Bruce, 2006). In terms

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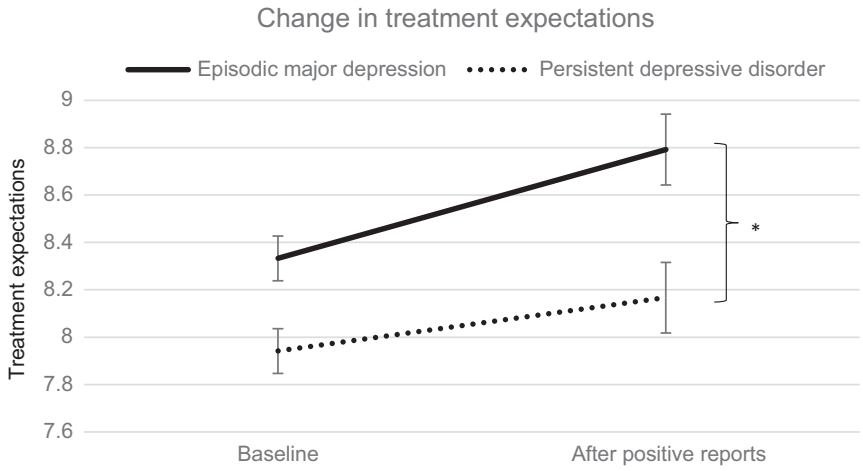


Figure 1. Results of the differences between persistent and episodic depression in changing expectations of psychotherapeutic treatment. The results show that participants with episodic depression adjusted their treatment expectations in response to other patients' reports of the positive effects of psychotherapy more than participants with persistent depression. * $p < .05$, error bars reflect the standard error of the mean.

of underlying mechanisms, the present study focused on the role of cognitive immunization. Consistent with theoretical predictions (Kube et al., 2020; Rief & Joormann, 2019), we found that changes in treatment expectations were almost completely blocked in people with persistent depression if they underwent the cognitive immunization-promoting condition. This suggests that for people with persistent depression, integrating positive information about psychotherapy can be hindered if they become aware of differences between themselves and others. As a result, they may question the usefulness of such positive information and change their expectations less than they otherwise would. However, since this was not reflected by differences in the cognitive immunization scale, it is not entirely clear whether the results regarding changes in treatment expectations were really driven by this factor. It may be that the scale to assess cognitive immunization was just not good enough to capture this process. Another possible explanation, though, would be that the differences between the two subtypes of depression in changing treatment expectations were caused by another, unmeasured process, such as more pronounced negative affect (Kube, Kirchner, Gärtner, & Glombiewski, 2023) or attention bias (Everaert, Duyck, & Koster, 2014; Keller, Leikauf, Holt-Gosselin, Staveland, & Williams, 2019). However, interpretation bias and deficient recall can be ruled out as underlying mechanisms with a fair degree of certainty because the two subtypes of depression did not differ on these measures.

Another perspective on the finding that treatment expectations were more resistant to change in people with persistent depression is to consider patients' treatment history. According to this view, it is understandable that people with persistent depression are more hesitant to adjust their treatment expectations, given their frequent treatment failures and their often long history of suffering (Klein et al., 1999; McCullough, 2003). Thus, we suggest to interpret these results such that subjective disappointments with previous treatments made people with persistent depression more sceptical about the promised positive effects of psychotherapy. This interpretation is in line with recent qualitative findings indicating that people with depression often aim to avoid future disappointments, at the expense of holding on to negative beliefs (Kube & Rauch, 2025). It also accords well with the rationale of a psychotherapeutic treatment that was specifically developed for persistent depression, the cognitive behavioral analysis system of psychotherapy (CBASP), where the therapeutic relationship is specifically used to alter patients' treatment expectations (Brakemeier et al., 2015; Keller et al., 2000; Schramm et al., 2017). However, it is important to note that we did not collect more specific data on patients' previous treatments, so this interpretation must remain speculative at this point until further testing. It should also be noted that in absolute terms, people with persistent depression were not pessimistic regarding the effects of psychotherapy. Rather, the descriptive values of their treatment expectations suggest that their expectations were just less positive than those of people with episodic depression.

An additional perspective that may be worth exploring is that of developmental psychopathology. Specifically, research has shown that people with persistent depression often have a history of childhood maltreatment (Brakemeier et al., 2018; Brown et al., 2013), which is a risk factor for important aspects of the psychopathology of persistent depression, such as impaired social cognition and interpersonal problems (Struck, Gärtner, Kircher, & Brakemeier, 2021). It is also discussed as a predictor of worse course of depression (Nanni, Uher, & Danese, 2012; Nelson, Klumparendt, Doebler, & Ehring, 2017) and treatment outcomes (Bausch et al., 2020; Harkness, Bagby, & Kennedy, 2012; Nanni et al., 2012). In view of the prevalence of childhood maltreatment in people's histories and its detrimental psychological consequences, it is understandable that many of the people who are diagnosed with persistent depressive disorder have an early onset of the disorder (Agosti, 1999; Brockmeyer et al., 2015; Lizardi et al., 1995). Thus, aside from differences in treatment history, the etiology of persistent depression appears to be quite different from episodic depression, which is more often related to an unsuccessful adaptation to life events (Andrews & Thomson, 2009; Durisko, Mulsant, & Andrews, 2015; Nesse, 2000). Accordingly, although the aforementioned factors were not assessed in the present study, this developmental perspective may explain why the expectations of people with persistent depression are more resistant to change: They have been formed over a longer period of time, resulting in greater confidence in them. As a result, people with persistent depression may be less open to integrating other people's reports into their expectations (Barrett et al., 2016; Kube et al., 2020; Rief & Joormann, 2019). The disregard of such reports may be particularly pronounced if the differences between the other person

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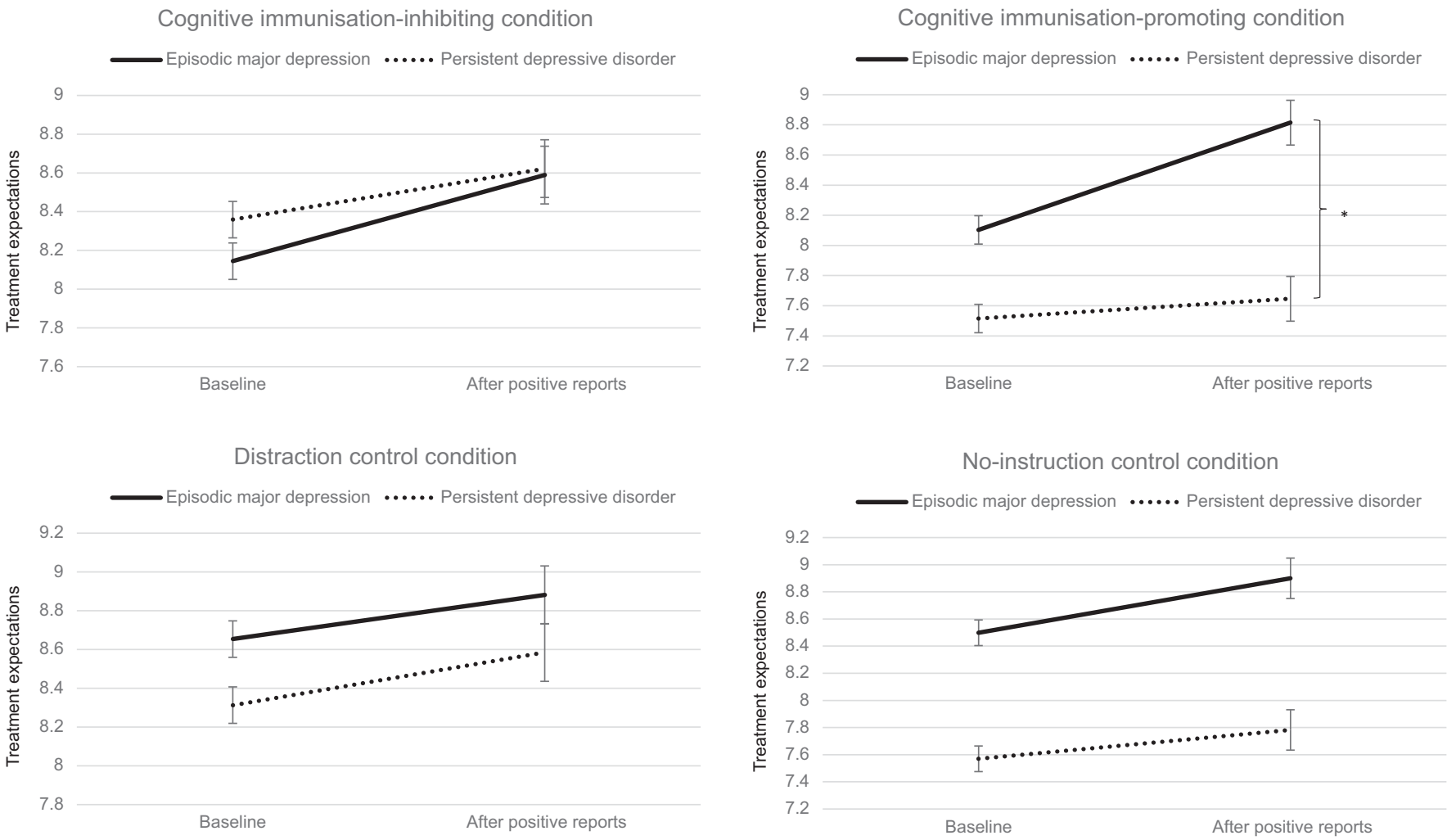


Figure 2. Results of the differences between persistent and episodic depression in change of expectations for psychotherapeutic treatment, separately for the four experimental conditions. As compared to participants with episodic depression, change in treatment expectations in participants with persistent depression was particularly low in the cognitive immunization-promoting condition. * $p < .05$, error bars reflect the standard error of the mean.



Figure 3. Differences between persistent and episodic depression in changing expectations of future life events. The results show that participants with episodic depression adjusted their expectations descriptively somewhat more than participants with persistent depressive disorder, but this effect was not statistically significant. Error bars reflect the standard error of the mean.

and oneself are salient, which may explain why people with persistent depression had particular difficulty revising their expectations in the cognitive immunization-promoting condition.

Aside from treatment expectations, it is not so surprising that people with persistent depression did not differ from people with episodic depression in changing expectations of future life events, because this type of expectation has not been considered a core feature of persistent depression that distinguishes it from episodic depression. Rather, since persistent depression has been theorized to be linked to negative interpersonal expectations (e.g. 'Others will treat me badly'), it is conceivable that the two subtypes of depression would differ in the degree of change in interpersonal expectations (Kirchner et al., 2025; McCullough, 2003).

Clinical implications

The finding that the treatment expectations of people with persistent depression, as compared to episodic depression, are not only generally lower but also more resistant to change is important from a clinical point of view, as treatment expectations have been considered an important predictor of psychotherapy outcomes (Constantino et al., 2018; Greenberg et al., 2006). Thus, the risk of treatment failure might be higher in persistent depression than in episodic depression because people with persistent depression are less likely to expect to benefit from psychotherapy. On the other hand, given the treatment failures of many people with persistent depression in the past, it may actually be realistic for them to be more skeptical about the effects of psychotherapy. Nevertheless, in order to enhance the likelihood of benefitting from psychotherapy, it may be important to take additional efforts to increase patients' treatment expectations. To this end, it may be important for therapists to make sure that they are perceived as warm and competent when informing about the effects of psychotherapy, since the therapist's warmth and competence have been shown to modulate the degree to which people update their psychotherapy outcome expectations (Seewald & Rief, 2023, 2024). Furthermore, it may be worthwhile to use the therapeutic relationship to establish positive treatment expectations over the course of the first sessions of psychotherapy, as done in CBASP (McCullough, 2003). However, not only for psychotherapists but also for practitioners who refer patients to psychotherapy, it may be important to improve patients' treatment expectations from the outset. In addition, the current results must not be interpreted in the sense that only patients with persistent depression need their clinicians to engage with their treatment expectations. Rather, also patients with episodic depression, like presumably all other patients, need their therapists to address their treatment expectations. In addition, with regard to the results regarding cognitive immunization, it may be important to prevent patients with persistent depression from focusing on differences between themselves and others when informing them about the effects of psychotherapy. To this end, it may be helpful to have patients specify why such information on the effects of psychotherapy may also apply to them.

Strengths and limitations

The present research was the first to systematically investigate differences between people with persistent and episodic depression in changing expectations in response to novel positive information, therein distinguishing between treatment expectations and expectations of future life events. To this end, we were able to use a relatively large data set from an outpatient sample. Further strengths can be seen in the careful diagnostic approach to distinguish between persistent and episodic depression, the assessment of a number of additional potentially relevant variables (i.e. clinical aspects and cognitive factors), and the preregistration of the umbrella project.

A significant limitation is that the question of the mechanisms underlying the differences between persistent and episodic depression in terms of changes in treatment expectations cannot be completely answered by the current data. Specifically, there is some indication that these differences may be related to the engagement in cognitive immunization, but the data does not fully support this suggestion. In addition, we did not collect more specific data on patients' treatment histories, which is why our interpretation of the results with regard to possible negative previous treatment experiences in people with persistent depression must remain speculative. A further limitation is that we focused only on expectations of future life events as an empirically supported example of depression-specific expectations (Miranda & Mennin, 2007), but we acknowledge that other disorder-specific expectations are important as well, such as expectations of social rejection

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(Kirchner et al., 2023; Kirchner, Schummer, Krug, Kube, & Rief, 2022) and expectations regarding mood regulation (Backenstrass et al., 2006; Catanzaro, 1996).

With regard to the sample, we explained in the methods section why we opted against examining also a healthy control sample. However, we note that the absence of a healthy control sample may still be seen as a limitation, as the inclusion of a healthy control sample would have allowed us to examine whether people with persistent versus episodic depression respond differently to the manipulation of cognitive immunization as compared to healthy participants. Our reasoning was that this question cannot be well addressed with the current design focusing on treatment expectations, because the idea of seeking psychotherapeutic help would necessarily be hypothetical for healthy volunteers. However, we acknowledge that the inclusion of a healthy control sample would have been helpful to determine the extent to which depression in general contributed to the current results. Yet, this issue does not negate the differences between episodic and persistent depression, which was the main focus of the present article. Furthermore, in terms of sample size, we note that the study was sufficiently powered to examine differences between the two subtypes of depression in expectation change, but the power to uncover interactions with the experimental conditions may not have been sufficient, although there was indeed a significant time by diagnosis by condition interaction for treatment expectations. Moreover, we note as a further limitation that the degree of diversity of the videos presented was limited, although this was inevitable with only four characters. In addition, the fact that three of the four characters were female was not ideal in terms of gender balance.

Conclusions

The present research demonstrates that in people with persistent depression, expectations of psychotherapeutic treatment are overall lower and more resistant to change than in people with episodic depression. This difference between the two subtypes of depression was particularly pronounced for psychotherapy outcome expectations, whereas it was smaller for role expectations. In addition, the results suggest that the resistance to change of treatment expectations in persistent depression is particularly strong when patients become aware of differences between themselves and other patients who report to have benefitted from psychotherapy, as indicated by the effects of the cognitive immunization manipulation. Beyond treatment expectations, we found that people with persistent depression and people with episodic depression did not differ in adjusting expectations of future life events. Further research is needed to identify strategies through which more positive treatment expectations in people with persistent depression can be established.

Supplementary material. The supplementary material for this article can be found at http://doi.org/10.1017/S0033291725101530.

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Competing interests. The authors have no conflicts of interest to disclose.

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ORIGINAL PAPER

Understanding Biased Expectation Change in Depression – The Influence of State Affect and Affect Regulation

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Abstract

Purpose People with depression tend to hold on to negative expectations despite positive expectation-disconfirming experiences. Research has made progress on understanding the cognitive mechanisms underlying these problems, however, knowledge about affective mechanisms is scarce. This study aimed to investigate the influence of affect and affect regulation on expectation change in depression.

Methods $N = 80$ outpatients with depression completed two parts of a performance test. In a randomized order, they received positive feedback after one part and negative feedback after the other part. Participants either received an induction of amusement ($n = 40$) or sadness ($n = 40$) before each part of the test. Affect regulation was assessed using self-report measures. Performance expectations were measured before taking the test, after receiving positive feedback, and after receiving negative feedback. Expectation change was defined as the degree to which participants lowered vs. raised their expectations in response to the respective feedback.

Results Expectation change was larger in response to negative than to positive feedback. Affect did not influence expectation change. The results suggest that baseline expectations and affect regulation influenced expectation change in sad participants.

Conclusion The results show that people with depression have more difficulty adapting their expectations if new information is positive than if it is negative. State affect, however, did not influence expectation change, most likely because the effects of the emotion-inducing video-clips were not long-lasting enough. Our results point out the relevance of further exploring the effect of baseline expectations and affect regulation on expectation change.

Keywords Major depression · Expectation change · Affect · Belief updating · Cognitive bias

Dysfunctional expectations constitute a core feature of depression (Kube et al., 2018b; Rief & Joormann, 2019; Strunk & Adler, 2009). As such, they are predictive of the course of depressive symptoms, e.g., by predicting relapse (Gopinath et al., 2007), treatment outcome (Gordon et al., 2011) and symptom severity at post treatment (Ludman et al., 2003). Thus, modifying dysfunctional expectations in depression is of high clinical importance (Rief & Glombiewski, 2016; Wilhelm et al., 2022). However, this is often challenging, since people with elevated levels of depression tend to hold on to dysfunctional expectations even when they make positive, expectation-disconfirming experiences (Everaert et al., 2018; Kube et al., 2019b). In other words, people with depressive disorders (vs. non-clinical controls) show difficulties in changing expectations into positive direction after receiving novel positive information (Kube et al., 2019), while they do not differ from non-clinical controls in changing expectations into negative direction after receiving novel negative information (Kube et al., 2019). Thus, a better understanding of the mechanisms that contribute to the maintenance of dysfunctional expectations is necessary to be able to effectively modify them. To this end, the present study investigated the influence of state affect[1] on expectation change in patients with depression. This question is of significance because people with depression often have negative affect and if such negative affect were

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[1] The terms “mood” and “affect” are often used synonymously in experimental clinical research. For this reason, we also use them in an interchangeable way.

to hamper the ability to process and integrate novel positive information, this would be a plausible explanation for why people with depression have difficulty with learning from new experiences.

As reviewed by Kube (2023a), previous studies in this field have put a special focus on the investigation of cognitive mechanisms, such as interpretation inflexibility (Everaert et al., 2018; Liknaitzky et al., 2017), lack of optimistic update bias (Hobbs et al., 2022; Korn et al., 2014), and the devaluation of disconfirmatory evidence, referred to as cognitive immunization (Kube et al., 2019; Kube, Rief, Kube et al., 2019a, b, c). However, research on potential affective mechanisms of the persistence of dysfunctional expectations in depression is still scarce. Elucidating possible affective mechanisms could be vital to the understanding of the failure to integrate new positive learning experiences in depression, because they may amplify maladaptive cognitive processes and result in a self-reinforcing negative feedback loop (Smith et al., 2018). The general idea that current affect influences the update of self-beliefs and expectations draws from different theoretical lines of reasoning.

First, research from the general psychology literature suggests that the question of how well an information can be processed depends on whether its valence is congruent with people's current affect, referred to as mood-congruency approach (Ziegler, 2010, 2014). This means that if people are currently experiencing negative affect, they might be able to effectively process negatively valent information, but would have difficulty processing positively valent information – and vice versa. Thus, depending on people's current affect, it will be more vs. less difficult for people to adjust their expectations in response to positive vs. negative information. Second, with reference to the *impaired cognitive disengagement hypothesis* in depression (Koster et al., 2011), it is plausible that the incongruence between negative affect and positive information is a particularly important problem in clinically depressed people. According to this hypothesis, the occurrence of negative affect is often accompanied by dysfunctional rumination, which further amplifies negative affect, and so forth. As a result, people with depression have difficulty disengaging from negative contents and, accordingly, have problems using new information to revise their beliefs. Third, in terms of *interoceptive predictive processing* (Allen, 2019; Barrett et al., 2016; Barrett & Simmons, 2015), people use their interoceptive state as an additional source of information to weight sensory input. For instance, if the externally received information is positive (e.g., "You did well"), but the information from the interoceptive state is negative because of negative affect (e.g., "I'm feeling down"), this discrepancy may bias the update of people's beliefs towards the momentary affect.

Some of these predictions have been confirmed by previous research in the context of depression. Preliminary research has shown that negative affect, which is particularly prevalent in people with depression, can hinder the adjustment of negative performance expectations in response to positive performance feedback. Specifically, in an inpatient sample of patients with depression, the activation of negative affect before receiving positive performance feedback lowered the likelihood of integrating the feedback, relative to the activation of positive affect (Kube et al., 2023). In a non-clinical sample and a subclinical sample, there was no significant difference between the activation of negative and positive affect or a neutral control condition, respectively; however, there was evidence that with increasing levels of depression, expectations were less adjusted to positive feedback and this relationship was more pronounced when negative affect was induced (Kube, Glombiewski, Kube et al., 2019a, b, c, 2023). In another study using a non-clinical sample, the induction of negative affect hindered the update of beliefs about the self in response to positive social feedback, relative to the induction of positive affect (Kube & Korn, 2024). Additionally, a recent study in the field of predictive processing by Ramos-Grille et al. (2022) found that participants with depression (vs. non-clinical controls) showed greater prediction errors (i.e., less trial-by-trial flexibility in their expectations) and this was even more pronounced after inducing sadness.

However, from previous research, it remains unclear whether negative affect only limits integrating novel positive information in depression or any information regardless of its valence. The present research addressed this issue by not only manipulating affect (sadness vs. amusement) but also the valence of feedback (negative vs. positive). To build our hypotheses, we considered the following related bodies of literature.

According to the aforementioned *mood-congruency approach*, the congruency between people's mood and the valence of new information is crucial for effective information processing (Ziegler, 2010, 2014). Similarly, research on mood-biased predictive judgements (for a review, see Eldar et al., 2016) has indicated that positive affect leads to more optimistic and less pessimistic predictions about future events (Paul & Pourtois, 2017), whereas negative affect leads to less optimistic and more pessimistic predictions (Mayer et al., 1992; Wright & Bower, 1992). Applying this to our research question, sadness should only reduce the integration of positive feedback, with which it is incongruent, but not of negative feedback.

Another body of literature suggests that learning (Bakic et al., 2014) and cognitive flexibility (Dreisbach & Goschke, 2004; Goschke & Bolte, 2014) is enhanced under positive affect while transfer and learning (Brand et al., 2007)

and the application of contextual information (Masuyama & Mochizuki, 2020) is hampered under negative effect. According to these lines of research, expectation change would be supposed to be impaired under negative affect, regardless of the valence of the feedback received.

Acknowledging the theoretical plausibility of both – a *mood-congruency effect* and a general impairment of expectation change under negative affect – we opted to ground our hypotheses in the former for the following reason. We believe that our rationale for investigating expectation change in response to negative vs. positive performance feedback in dependence of negative vs. positive state affect is more closely related to the methodology of research on the *mood-congruency effect*, which also puts a focus on how affect effects the content of thinking by giving it a mood-congruent color. On the other hand, the above-referenced line of research on impaired learning under negative affect might be more loosely related to our rationale as it focuses rather on the relation between affect and formal impairments in thinking.

Accordingly, we tested the following hypotheses. Based on previous research indicating reduced integration of novel positive information in depression (as reviewed by Kube, 2023a), we first predicted that receiving *positive feedback* will lead to less *expectation change* than receiving *negative feedback*. Second, in terms of a *mood-congruency effect*, we hypothesized that the influence of feedback on *expectation change* is greater if the valence of *feedback* (*positive vs. negative*) is congruent with participants' *affect* (*amusement vs. sadness*).

Furthermore, it is important to consider that people do not passively experience affective states, but rather actively respond to them (Joormann & Stanton, 2016). This is of particular interest in depression, since depression is associated with altered affect regulation resulting in an increased experience of negative affect and reduced experience of positive affect (Joormann & Stanton, 2016). Relevant affect regulation strategies in this context include *rumination* in response to negative affect, *suppression* of negative as well as positive affect and *dampening* of positive affect (Bean et al., 2022; Beblo et al., 2012; Joormann & Stanton, 2016). Moreover, in recent years, these strategies have been widely associated with cognitive biases, such as interpretation inflexibility (Everaert et al., 2020), over-general autobiographical memories (Joormann & Stanton, 2016), or cognitive costs, such as impaired memory (Gross, 2002). Given the importance of such response styles in depression, we will also explore how *rumination*, *suppression of positive and negative feelings*, and *dampening of positive feelings* relate to *expectation change* in depression.

Rumination has been defined as repetitive thinking about one's depressive symptoms and their causes, implications and meanings in response to negative affect (Nolen-Hoeksema et al., 2008). As rumination worsens and maintains negative affect (e.g., Vickers & Vogeltanz-Holm, 2003), we expected that the impact of our sadness-induction on expectation change will be boosted in individuals with high levels on rumination. *Suppression* is defined as an attempt to reduce affective reactions, including expressional, psychological and psychophysiological characteristics (Beblo et al., 2012). As suppression is cognitively demanding and as such impairs working memory (e.g., Richards & Gross, 1999), we expected suppression to hinder expectation change. *Dampening* has been defined as cognitive down-regulation of positive affect by negatively appraising positive affective experiences (Bean et al., 2022). As dampening has been shown to be linked to negative interpretation bias (Everaert et al., 2020), we expected reduced expectation change in response to positive feedback in individuals with high levels in dampening.

Method

We report how we determined our sample size, all data exclusions, all manipulations and all measures in the study. All data, analysis code, and research materials are available at https://osf.io/7q2v5/?view_only=ad992506a8754d1d93b51121a1013586 (Rapo et al., 2023). Data were analyzed using R-Studio Version 4.2.2 (R Core Team, 2022) using the following packages: "tidyverse" (Wickham et al., 2019), "ggpubr" (Kassambara, 2022b), "reshape2" (Wickham, 2007), "psych" (Revelle, 2022), "utils" (R Core Team, 2022), "car" (Fox & Weisberg, 2019), "lme4" (Bates et al., 2015), "lmerTest" (Kuznetsova et al., 2017), "emmeans" (Lenth, 2023), "effectsize" (Ben-Shachar et al., 2020), "datarium" (Kassambara, 2019), "patchwork" (Pedersen, 2023), and "rstatix" (Kassambara, 2022a). The local ethics committee (reference number 2019 – 216) approved the study. Study design, hypotheses and analysis plan were preregistered at 'AsPredicted' (https://aspredicted.org/FDG_5F7). All participants gave written informed consent.

Participants

We determined the required sample size with an a-priori power simulation using the packages "lme4" (Bates et al., 2015) and "simr" (Green & MacLeod, 2016) in R-Studio (R Core Team, 2022). Thereby, we specified a linear mixed model as indicated in the main analysis below. Based on the literature on the modification of expectations in depression (Kube et al., 2019) and the influence of affect on expectation change in depression (Kube et al., 2023), we predefined the following regression weights: $\beta = 0.27$ for *Feedback*, $\beta = 0.1$

for *Affect* and β = 0.1 for *Baseline expectations*. For the main effect of *Feedback*, a power of 83.3% was found for a sample of $N = 42$. To be able to address our research question regarding the affective mechanisms, we pre-registered the aim to recruit a larger sample of $N = 80$ individuals, even though according to our a-priori power analysis this sample size appeared to be insufficient to reliably detect an interaction effect of feedback and affect. In fact, according to our a-priori power simulation a sample size of $N = 305$ would have been required to reliably detect an interaction effect of feedback and affect (1-β = 80.5). We decided to address our research questions using the sample size of $N = 80$ nevertheless, as a similar sample size proved to be sufficient to detect an interaction effect of affect and feedback in a previous study using the EXPEC (Kube et al., 2023). We recruited patients from an university outpatient clinic who met the criteria of an episodic major depressive disorder or Dysthymia (ICD-10: F32.0-F32.2, F33.0-F33.2, F34.1) as the primary diagnosis, according to a diagnostic interview (usually the German version of the Structured Clinical Interview for DSM SCID-5-CV; Beesdo-Baum et al., 2019) or the German „Diagnostisches Kurz-Interview bei psychischen Störungen“ (Mini-Dips; Margraf, 1994), as determined by trained clinical psychologists. The SCID-5-CV is a reliable and valid diagnostic instrument with good to excellent inter-rater-reliability (κ ≥ 0.7; Osório et al., 2019). Dysthymia could also be a secondary diagnosis if patients met the criteria of a major depression as the primary diagnosis (reflecting a “double depression”). The diagnoses were based on ICD-10 classification which represented the common classification system in clinical practice in Germany at the time the study was conducted. Further inclusion criteria were: minimum age of 18 years and fluency in German. Exclusion criterion was a bipolar affective disorder. Participants received financial compensation (8€) for their participation. We recruited $N = 84$ participants from September 2021 until June 2023. Four participants were excluded due to diagnostic failure, resulting in a final sample size of $N = 80$ (53 female, 25 male, 2 diverse). Their age ranged from 18 to 64 years ($M = 35.01$, $SD = 13.95$). For an overview of the sample characteristics, see Table 1. There were unintended significant differences in age between affect-conditions, with age being significantly lower in the amusement-condition ($M = 31.95$, $SD = 13.02$) than in the sadness-condition ($M = 38.08$, $SD = 14.33$; $t(78) = -2.00$, $p = .049$). There were no significant differences in baseline affect or severity of depressive symptoms.

Table 1 Sample characteristics

Variable	
Age in years, *M (SD)*	35.01 (13.95)
Gender, *N (%)*	
Male	25 (31.25)
Female	53 (66.25)
Diverse	2 (2.5)
Highest educational level, *N (%)*	
School student	3 (3.75)
School diploma	28 (35)
Qualification for university entrance	34 (42.5)
University diploma	10 (12.5)
Other	5 (6.25)
Employment status, *N (%)*	
In Training	6 (7.5)
Student	16 (20)
Employee	37 (46.25)
Self-employed	8 (10)
Unemployed	8 (10)
Other	5 (6.25)
Diagnoses (ICD-10), *N (%)*	
Primary diagnosis	
Major depressive episode	26 (32.5)
Recurrent depressive disorder	41 (63.75)
Dysthymia	3 (3.75)
Secondary diagnosis	
None	42 (52.5)
Substance use disorder	4 (5)
Dysthymia	10 (12.5)
Phobic disorder	10 (12.5)
Generalized anxiety disorder	5 (6.25)
Obsessive compulsive disorder	2 (2.5)
Posttraumatic stress disorder	3 (3.75)
Eating disorder	2 (2.5)
Other	2 (2.5)
Tertiary diagnosis	
None	67 (83.75)
Phobic disorder	5 (6.25)
Obsessive-compulsive disorder	1 (1.25)
Eating disorder	1 (1.25)
Insomnia	1 (1.25)
Personality disorder	1 (1.25)
Other	4 (5)
BDI-II, *M (SD)*	24.15 (9.41)

General Procedure

A graphical illustration of the experimental procedure is shown in Fig. 1. The study was conducted via www.soscisurcey.de. We collected data at a laboratory room of the RPTU Kaiserslautern-Landau. The procedure is an adapted version of the well-established “EXperimental Paradigm to investigate Expectation Change (EXPEC; Kube et al., 2018). Before starting the study, participants red a study information which contained the following cover story: “The aim of the study is to investigate the extent to which the presence of a sad or happy mood influences one’s own expected and actual performance. Previous studies have shown that people with depressive symptoms tend to underestimate their

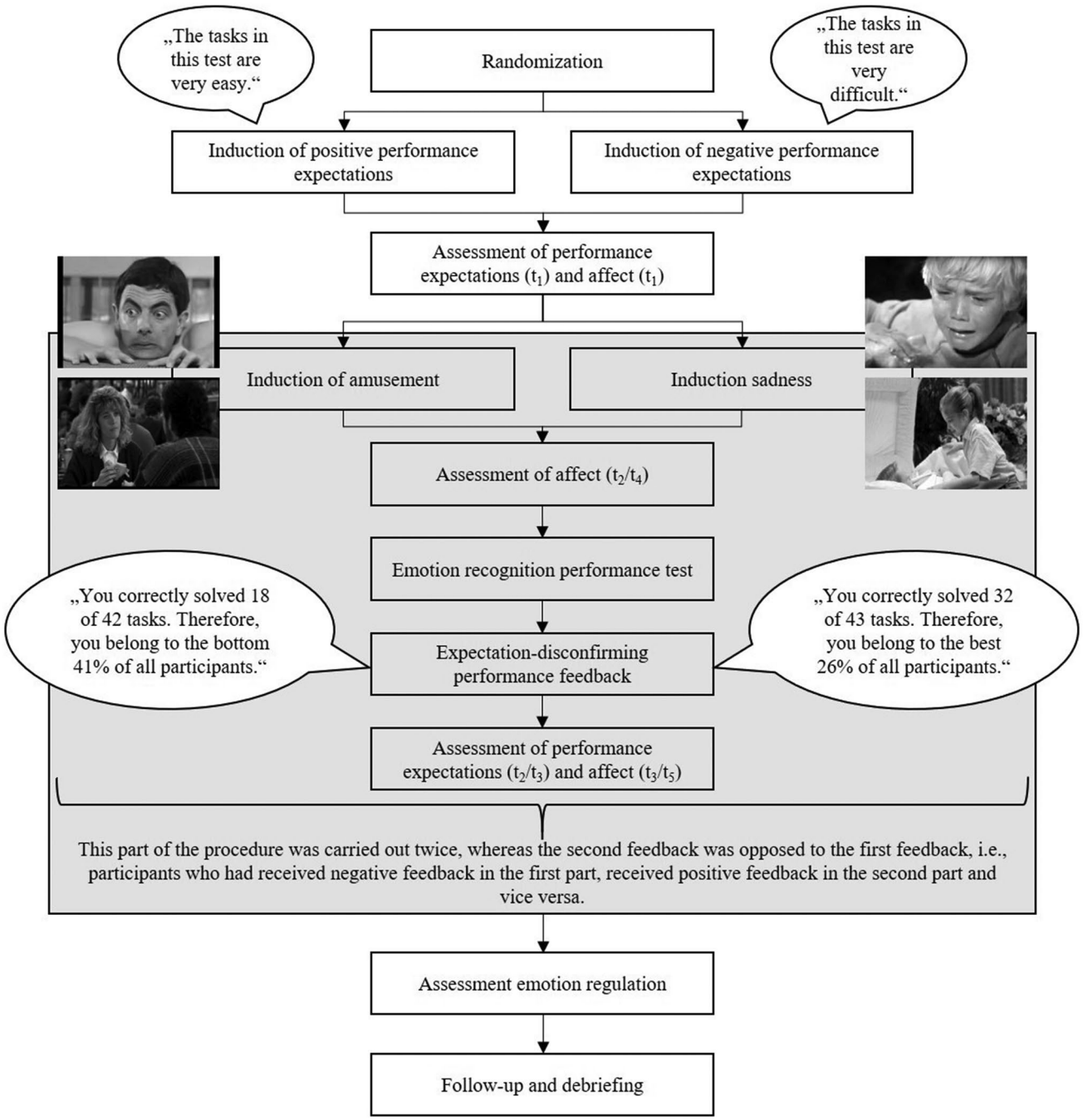


Fig. 1 Study procedure

own performance. In our study, we are now interested in how the current mood influences this effect."

Following this, either positive ("The tasks in this test are very easy") or negative ("The tasks in this test are very difficult.") baseline expectations were induced. Then baseline expectations and affect were assessed. Subsequently, participants received the first affect induction (amusement vs. sadness), which was followed by another assessment of affect.

Participants then took the first part of the performance test, which was followed by expectation-disconfirming feedback. That is, participants who previously received an induction of positive expectations now received negative feedback and vice versa. This was followed by another measurement of affect and expectations.

Then, affect was induced a second time. Participants who previously received an induction of amusement again received an induction of amusement and participants who

previously received an induction of sadness again received an induction of sadness. This was followed by another measurement of affect.

Participants took the second part of the performance test and received feedback that disconfirmed the feedback from the first part. That is, participants who received negative feedback after the first part now received positive feedback and vice versa. Subsequently, expectations and affect were measured again.

At the end, emotion regulation and sociodemographic variables were assessed and participants were debriefed.

Manipulation of Baseline Expectations

We manipulated participants' baseline expectations to be able to systematically disconfirm them subsequently. Randomly, we induced either positive ("The tasks in the test were designed by the developers to be very simple and to be correctly solved by most people.") or negative ("The tasks in the test were designed by the developers to be very difficult and to be correctly solved by only few people.") baseline expectations at the beginning of the study. Both the induction of positive and negative baseline expectations were successfully used in previous studies on expectation change using the EXPEC task (Kube & Glombiewski, 2021; Kube et al., 2023; Kube, Rief, Kube et al., 2018a, b).

Performance Test

As in previous studies using the EXPEC task (Kube & Glombiewski, 2021; Kube et al., 2023; Kube, Rief, Kube et al., 2018a, b), participants completed the "Test of Emotional Intelligence" (TEMINT; Schmidt-Atzert & Bühner, 2002). The main reason for the choice of the test is that estimating their actual performance on the test is difficult for participants, which is an important prerequisite for the credibility of the standardized feedback. Another advantage of the TEMINT is that depression is unrelated to actual performance deficits in this test (Kube et al., 2022). For the current study, the TEMINT was split into two parts, each comprising six brief descriptions of situations that were actually experienced by a real person (e.g., "Computer scientist, age 30: 'My cat was sick, I had to take her to the vet. I believed that I had poisoned her with the insect spray.'"). For each situation, participants had to empathize with the respective person and rate how much this person had experienced certain emotions (e.g., fear, sadness or guilt) on a scale from 1 ("non-existent or very weak") to 3 ("strong or very strong"). Completing each part of the TEMINT was followed by standardized performance feedback as described below.

Performance Feedback

After each of the two parts of the TEMINT, participants received standardized performance feedback, which was independent of their actual performance. The feedback was supposed to convey a disconfirmation of participants' expectations: Participants who underwent the induction of positive baseline expectations received negative feedback after the first part of the TEMINT ("You correctly solved 18 of 42 tasks. Thus, you belong to the bottom 42% of all participants."); participants who underwent the induction of negative expectations received positive feedback ("You correctly solved 32 of 43 tasks. Thus, you belong to the best 26% of all participants."). After completing the second part of the TEMINT, participants received feedback again. Those who received positive feedback for the first part received negative feedback for the second part and vice versa.

We chose the specific percentages fed back to participants based on the following reasoning. We assumed that for the feedback to be perceived as negative, people should be informed that they are in the bottom half of the distribution. On the other hand, the percentage should not be too low since the TEMINT tasks are in fact not very difficult and being told that one solved just a few tasks correctly could be considered implausible. Accordingly, we reasoned that being among the bottom 42% would be perceived as negative by most people, but not implausibly negative. For the positive feedback, we assumed that it should be clearly in the upper half of the distribution. Also, we reasoned that it must not be too positive to prevent doubts about its credibility. Indeed, research has shown that extremely positive feedback raises doubts about its credibility and entails little expectation change, as opposed to moderately positive feedback (Kube, 2023b; Kube et al., 2022b). Accordingly, we opted for the upper 26%.

Induction of State Affect

Participants were randomly assigned to one of two affect-conditions: sadness and amusement. We induced affect by showing a short video-clip before each of the two parts of the TEMINT. We decided to show a movie clip before both parts of the TEMINT because we wanted to make sure that the affect induction was as equally effective as possible for both parts of the study procedure. The order of the video-clips was randomized. Participants in the amusement-condition watched a sequence of "The curse of Mr. Bean" (2:58 min) and of "Harry & Sally" (2:46 min). Participants in the sadness-condition watched a sequence of "My Girl" (2:17 min) and "The Champ" (2:44 min). Previous studies demonstrated the effectiveness of the video-clips in inducing amusement or sadness, respectively (Gabert-Quillen et

al., 2015; Gilman et al., 2017; Gross & Levenson, 1995; Jurásová, Kinga & Špajdel, Marián, 2013). To avoid non-respondents, we supplemented the videoclips with the following instruction: "Try to imagine as best as you can how you would feel if you were present in this situation and observing the scene.", following the suggestion of Rottenberg et al. (2018). We decided to induce sadness and amusement due to the following reason: As this study aimed to replicate and supplement the results of Kube et al. (2023), who used the film-clips of "The Champ" and "When Harry met Sally", we decided to use the same film-clips in order to retain as much of their study protocol as possible.

Measures

Performance Expectations

We assessed expectations using the *Performance Expectations Scale* (Kube et al., 2018). The scale consists of two items to assess task-specific performance expectations (e.g., "Solving the tasks of the test will be easy for me.") and two items to assess generalized performance expectations (e.g., "Solving unknown tasks in general will be difficult for me."; reversely scored) with a seven-point Likert-scale from 1 ("totally disagree") to 7 ("totally agree"). High scores on the scale represent positive performance expectations. In our sample, internal consistency was good to excellent for task-specific expectations ($\alpha = 0.88–0.91$) and excellent for generalized expectations ($\alpha = 0.90–0.95$). Performance expectations were measured three times: After the induction of baseline expectations, after receiving the first feedback and after receiving the second feedback.

Affect

We assessed affect, using the subscales *Sadness* and *Joviality*[2] of the German version of the *Positive And Negative Affect Scale - expanded form* (*PANAS-X*; Röcke and Grühn (2003). The subscale *Sadness* contains five and the subscale *Joviality* eight items, each measuring the intensity with which one experiences a facet of the respective affect (e.g., "alone" in the Subscale *Sadness* or "enthusiastic" in the subscale *Joviality*) using a five-point Likert scale from 1 ("not at all") to 5 ("extremely"). We decided to use the subscales instead of the full PANAS, since our manipulation of affect aimed to induce specific affective states (amusement vs. sadness) as opposed to general positive vs. negative affect. The *PANAS-X* is a reliable and valid measure for the assessment of self-reported affect (Watson & Clark, 1994). High scores on the scales represent a high intensity of self-reported joviality or sadness, respectively. In our sample, internal consistency was good to excellent for *Sadness* ($\alpha = 0.86–0.93$) and excellent for *Joviality* ($\alpha = 0.90–0.97$). Affect was measured five times: Right before and after each of the two affect manipulations and at the end of the study after receiving the last feedback.

Cognitive Immunization

As previous studies using the EXPEC task put a special focus on cognitive immunization, we also included cognitive immunization in this study. As it did not constitute a central construct in our study and there were no significant results regarding cognitive immunization, results regarding cognitive immunization will be presented in the supplement only (Online Resource 1). We assessed cognitive immunization using the *Cognitive Immunization after Performance Feedback scale* (*CIPF*; Kube et al., 2019). The scale consists of six items: two assessing the perceived credibility of the feedback received, two assessing the perceived relevance of the feedback and two assessing the extent to which people consider the feedback an exception to their normal performance. High scores on the scale represent high levels of cognitive immunization. In our sample, internal consistency was acceptable to good ($\alpha = 0.77–0.81$).

Depressive Symptoms

We assessed depressive symptoms using the German translation of the *Beck-Depression-Inventory Revised Version* (*BDI-II*; Hautzinger et al., 2009). The *BDI-II* consists of 21 items, each measuring the manifestation of typical symptoms of depression on a scale from 0 to 3. High sum scores on the scale represent high severity of depressive symptoms. In our sample, internal consistency was good ($\alpha = 0.89$).

Affect Regulation and Other Measures

As described above, we also included self-reported rumination, suppression and dampening of positive feelings. We decided to include these constructs because they are linked to depressive symptoms (Bean et al., 2022; Beblo et al., 2012; Joormann & Stanton, 2016), cognitive biases (Everaert et al., 2020; Joormann & Stanton, 2016) and cognitive costs (Gross, 2002) and could thus offer an additional exploratory value for altered expectation change in depression. We measured rumination using the shortened German version of the *Response Style Questionnaire* (*RSQ-D*; Bürger & Kühner, 2007), Suppression of positive and negative feelings using the subscales *Suppression/Dampening* of the *Fragebogen zur Erfassung der Akzeptanz von unangenehmen und*

[2] Note that *joviality*, representing a dimension of the PANAS, is pretty much the same as *amusement* as elicited by the emotion-inducing film clips. Accordingly, we use the two terms interchangeably.

angenehmen Gefühlen (*FrAGe*; Beblo et al., 2011) and dampening of positive feelings using the subscale *Dampening* of the German version of the *Responses to Positive Affect Questionnaire* (*RPA*; Voss et al., 2019). The *RSQ-D* and the *RPA* measure the frequency with which people use the respective affect regulation strategy. The *RSQ-D* comprises 21 items, and the *RPA* comprises eight items with a four-point Likert-scale ranging from 1 ("almost never") to 4 ("almost always"). The subscale *Suppression/Dampening* of the *FrAGe* measures the tendency to suppress feelings using eight items each for positive and negative feelings on a six-point Likert-Scale ranging from 1 ("Not at all") to 6 ("Extremely"). The measures show good psychometric properties (Beblo et al., 2011; Bürger & Kühner, 2007; Voss et al., 2019). In our sample, the internal consistencies of all measures were good ($\alpha = 0.81–0.89$). Further measures who were integrated in the study, but were not included in the analysis for this paper were the German version of the *Trait-Meta-Mood-Scale* (Otto et al., 2001) and *Die Skala Angst vor negativer Bewertung 5* (*SANB-5*, Kemper et al., 2012).

Sociodemographic Variables

We assessed gender, age, level of formal education, employment status and level of German language fluency.

Statistical Analysis

We screened the data and tested the assumptions of analysis of variance and linear mixed models by analyzing residual plots and Q-Q-plots, conducting Levene-tests and determining Cook's distance for each dependent variable. We checked for potential baseline differences between affect-conditions by applying *t*-tests for continuous variables and Chi^2-tests for categorial variables. We verified that no demand effects were present by reading participants answers in the follow-up-interview.

Manipulation Checks

To test whether the manipulation of baseline expectations was successful, we conducted two separate Welch's *t*-tests with *baseline expectations* (*positive* vs. *negative*) as independent variable and *task-specific expectations* at t_1 and *generalized expectations* at t_1 as dependent variables, respectively.

To test whether our manipulation of *affect* (*amusement* vs. *sadness*) was successful, we specified two separate linear mixed models allowing the fixed effects *Time* (t_1 vs. t_2 vs. t_3 vs. t_4 vs. t_5) and *Affect-condition* to interact in explaining the dependent variables *amusement* and *sadness*, respectively.

Main Analysis

To test whether *positive* or *negative feedback* has varying effects on *expectation change* depending on *affect* (*amusement* vs. *sadness*), we specified linear mixed models allowing for an interaction between the fixed effects *Feedback* and *Affect* in explaining *task-specific* and *generalized performance expectations*, respectively. For the factor *Feedback* we defined an a-priori sum contrast to compare the deviation in expectation change for positive and negative feedback from average level of expectation change.

Exploratory Analysis

We conducted model comparisons as a data-driven approach to identify potential interaction effects between *Baseline Expectations*, *Feedback* and *Affect*. Therefore, we compared a model with exclusively additive effects of the fixed effects to five models each allowing for different combinations of interactions between these three effects. The model allowing an interaction between *Baseline expectations* and *Feedback* showed the best performance in explaining *task-specific expectations* and significant effects were followed up by post-hoc *t*-tests.

Furthermore, we conducted model comparisons with *Rumination*, *Suppression* and *Dampening*, respectively, as additional fixed effects. For all linear mixed models, a random intercept for each participant was estimated.

Results

Manipulation Check

Baseline Expectations

We tested whether our manipulation of baseline expectations (positive vs. negative) was successful by comparing task-specific and generalized performance expectations at t_1. As hypothesized, participants had significantly lower task-specific expectations ($M = 4.25$, $SD = 1.4$) when they believed the test would be difficult (negative expectations) than when they believed the test would be easy (positive expectations; $M = 5.1$, $SD = 1.39$; $t(77.15) = -2.7$, $p = .008$, $d = 0.62$(95%CI[-1.07;-0.16])), but did not differ significantly in generalized performance expectations ($M = 4.21$, $SD = 1.42$; $M = 4.5$, $SD = 1.58$; $t(78) = -0.86$, $p = .39$).

Amusement

We tested whether amusement decreased through watching the sad video-clips and increased through watching the amusing video-clips.

There was a significant main effect of *Time* ($F(4,312) = 11.11$, $p < .001$, $\eta^2 = 0.12$(95%CI[0.07;1.00])) and a significant interaction between *Time* and *Affect-condition* ($F(4,312) = 20.33$, $p < .001$, $\eta^2 = 0.21$(95%CI[0.14;1.00])). Post-hoc contrasts revealed that at t_2 ($t(187) = -7.14$, $p < .001$, $d = -1.02$(95%CI[-1.33;-0.72])) and t_4 ($t(187) = -6.43$, $p < .001$, $d = -0.94$(95%CI[-1.24;-0.64])), amusement was significantly lower in the sadness vs. amusement condition. Amusement significantly increased from t_1 to t_2 ($t(312) = 2.47$, $p = .014$, $d = 0.14$(95%CI[0.03;0.25])) and from t_3 to t_4 ($t(312) = 4.05$, $p < .001$, $d = 0.23$(95%CI[0.12;0.34])) in the amusement-condition and significantly decreased from t_1 to t_2 ($t(312) = -7.33$, $p < .001$, $d = -0.41$(95%CI[-0.53;-0.30])) and from t_3 to t_4 ($t(312) = -3.34$, $p < .001$, $d = -0.19$(95%CI[-0.30;-0.08])) in the sadness-condition. Thus, right before vs. after the manipulation of affect, amusement successfully increased in the amusement-condition and successfully decreased in the sadness-condition. However, this effect was not stable over time as amusement re-decreased from t_2 to t_3 ($t(312) = -6.09$, $p < .001$, $d = -0.34$(95%CI[-0.46;-0.23])) and from t_4 to t_5 ($t(312) = -2.53$, $p = .012$, $d = -0.14$(95%CI[-0.25;-0.03])) in the amusement-condition and re-increased in the sadness condition (t_2 to t_3: $t(312) = 2.32$, $p = .021$, $d = 0.13$(95%CI[0.02;0.24])) and t_4 to t_5: $t(312) = 3.99$, $p < .001$, $d = 0.23$(95%CI[0.11;0.34])). A graphical illustration of the course of amusement and a table with descriptive values can be found in the supplement (Online Resource 1).

Sadness

We tested whether sadness decreased through watching the amusing video-clips and increased through watching the sad video-clips.

There was a significant main effect of *Time* ($F(4,312) = 5.67$, $p < .001$, $\eta^2 = 0.07$(95%CI[0.02;1.00])) and a significant interaction between *Time* and *Affect-condition* ($F(4,312) = 20.9$, $p < .001$, $\eta^2 = 0.21$(95%CI[0.14;1.00])). Post-hoc contrasts revealed that at t_2 ($t(124) = 3.05$, $p = .003$, $d = 0.55$(95%CI[0.19;0.91])) and t_4 ($t(124) = 4.83$, $p < .001$, $d = 0.87$(95%CI[0.50;1.23])) sadness was significantly higher in the sadness vs. amusement condition. Sadness significantly increased from t_1 to t_2 ($t(312) = 4.65$, $p < .001$, $d = 0.26$(95%CI[0.15;0.38])) and from t_3 to t_4 ($t(312) = 6.11$, $p < .001$, $b_1 = 0.35$(95%CI[0.23;0.46])) in the sadness-condition and significantly decreased from t_1 to t_2 ($t(312) = -3.7$, $p < .001$, $d = -0.21$(95%CI[-0.32;-0.10])) and from t_3 to t_4 ($t(312) = -2.37$, $p = .018$, $d = -0.13$(95%CI[-0.25;-0.02])) in the amusement-condition. As for amusement, sadness was successfully manipulated, but this effect was not stable over time as sadness re-decreased in the sadness condition (t_2 to t_3: $t(312) = -3.28$, $p = .001$, $d = -0.19$(95%CI[-0.30;-0.07])) and t_4 to t_5: $t(312) = -5.88$, $p < .001$, $d = -0.33$(95%CI[-0.45;-0.22])). A graphical illustration of the course of sadness and a table with descriptive values can be found in the supplement (Online Resource).

Main Analyses

Valence of Feedback Predicts Expectation Change

We tested, whether valence of feedback, affect and an interaction between feedback and affect significantly predicted expectation change. There was a significant main effect of *Feedback* on task-specific expectations ($F(2,156) = 11.41$, $p < .001$, $\eta^2 = 0.13$(95%CI[0.05;1.00])) and generalized expectations ($F(2,156) = 8.55$, $p < .001$, $\eta^2 = 0.1$(95%CI[0.03;1.00])), indicating that participants lowered their expectations in response to negative feedback, whereas there was no significant expectation change in response to positive feedback. There was neither a significant main effect of *Affect* on task-specific expectations $F(1,136.94) = 0.66$, $p = .42$) or generalized expectations ($F(1,104.34) = 1.27$, $p = .26$) nor a significant interaction effect (task-specific expectations $F(2,156) = 1.35$, $p = .26$, generalized expectations: $F(2,156) = 2.07$, $p = .13$; see Fig. 2). To control for the unintended differences in age between affect-conditions, we conducted additional analysis with age as control variable. As age did not systematically influence the results of our main analysis, we did not control for age in any further analysis.

Exploratory Analysis

Baseline Expectations Interact with Feedback Based on State Affect

Given the surprisingly non-significant results for the effects of affect on expectation change, we explored whether this effect could have been masked by the manipulation of baseline expectations. To this end, we computed an exploratory model comparison (see Online Resource 1). In the case of task-specific expectations, the model showing the highest performance included an interaction between Baseline expectations and Feedback and an additive effect of Affect. A further graphical exploration of these effects (see Fig. 3), supplemented by post-hoc t-tests, indicated that there was a non-significant trend suggesting that believing that the test was difficult (vs. easy) hampered expectation

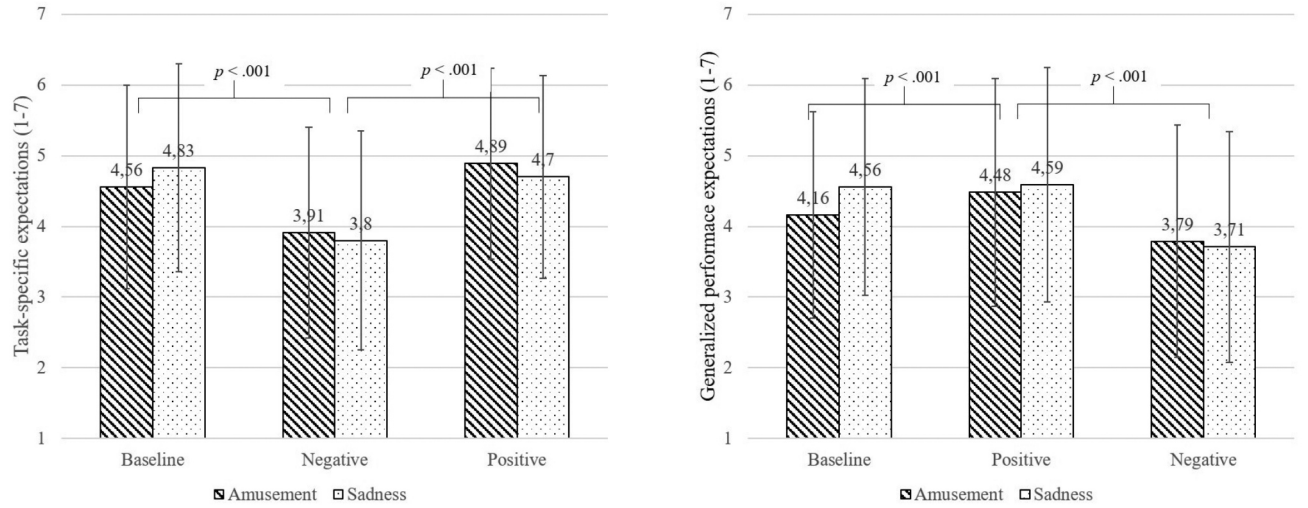


Fig. 2 Performance expectations at baseline, after negative feedback and after positive feedback. Note. Error bars represent standard deviations

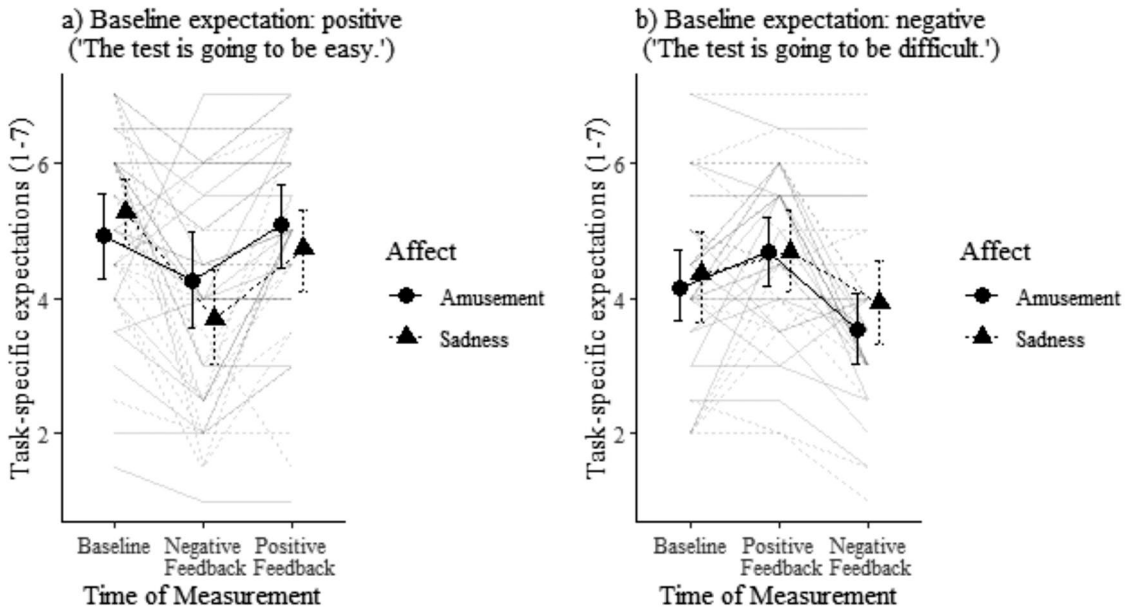


Fig. 3 Task-specific expectations in participants who were manipulated to believe that (**a**) the test is going to be easy (positive baseline expectations) and (**b**) the test was going to be difficult (negative baseline expectations) at baseline and after receiving positive and negative feedback. Participants of group (**a**) first received negative and then positive feedback and participants of group (**b**) vice versa

change in response to positive feedback ($p = .073$, Cohen's d = -0.41(95%CI[-0.86;0.04])). With regard to the additive effect of Affect, there was another non-significant trend suggesting that sadness (as opposed to amusement) did promote expectation change in response to negative feedback, but only in participants who believed that the test was going to be easy ($p = .068$, Cohen's d = 0.61(95%CI[-0.04;1.26])).

Does Affect Regulation Predict Expectation Change?

We conducted some exploratory model comparisons considering self-reported affect regulation strategies (see Online Resource 1). Except for *Suppression of negative feelings*, all assessed affect-regulation strategies had an additional exploratory value for expectations. To keep the presentation of results succinct, we report only the results regarding rumination in the main text, while the results for the other strategies are presented in the supplementary material.

There was a significant main effect of *Rumination*, with higher levels of rumination predicting overall lower performance expectations (task-specific expectations $t(80) = -3.84$, $p < .001$, $d = -0.43$(95%CI[-0.66;-0.20]), generalized expectations: $t(80) = -3.1$, $p = .003$, $d = -0.35$(95%CI[-0.57;-0.12])). There were no significant interaction effects with *Feedback*, indicating that rumination did not significantly predict expectation change, or *Affect*. However, on a graphical level (see Fig. 4), there were hints that in the case of sadness, rumination promoted change in expectations in response to negative feedback.

Discussion

The present work aimed to replicate and extend previous research showing that sadness can hinder the revision of negative expectations based on novel positive information in depression. In line with previous studies (Kube et al., 2019; Kube et al., 2019), we found that patients with depression showed more pronounced expectation change in response to negative as compared to positive performance feedback. However, unlike previous research (Kube et al., 2023), the induction of sadness vs. amusement before receiving feedback did not influence the extent to which participants integrated feedback. Thus, the non-significant effects of affect on expectation change are neither consistent with the hypothesized mood-congruency assumption, nor with a general deficit in updating expectations under sadness. The following explanations might account for the non-significant effects of affect on expectation change.

First of all, statistical power of our study was limited. In fact, as indicated by a post-hoc-power analysis, our model including the interaction term of feedback and affect showed a power of only 30.6% for task-specific expectations and a power of 41.9% for generalized performance expectations. Thus, our choice to aim for a sample size of $N = 80$ might have been too optimistic, as the effects of affect on updating in depression seem to be smaller than previously assumed (Kube et al., 2023). If we also look at the experimental affect manipulation, the data suggests that even though participants' affect was successfully modulated right after the experimental manipulation, these effects were neutralized by the next affect measurement, which took place right after receiving the performance feedback. Thus, it is likely that the induction of amusement or sadness was no longer effective when receiving the feedback.

Another explanation for the non-significant effects of affect on expectation change could be the complexity of our study design containing manipulations of baseline expectations, feedback and affect, which might have led to masking effects or complex interactions. Therefore, we carried out an exploratory model comparison to uncover putative masking and interaction effects using a data-driven approach. We found that baseline expectations (previously preregistered as a control variable) moderated the effect of feedback on expectation change. Specifically, negative baseline expectations reduced the impact of positive feedback on expectation change with a small effect size. In other words, participants showed a stronger resistance to positive feedback when they believed that the test was difficult (vs. easy). This is also in line with the results of Kube et al. (2022Kube (2023b),

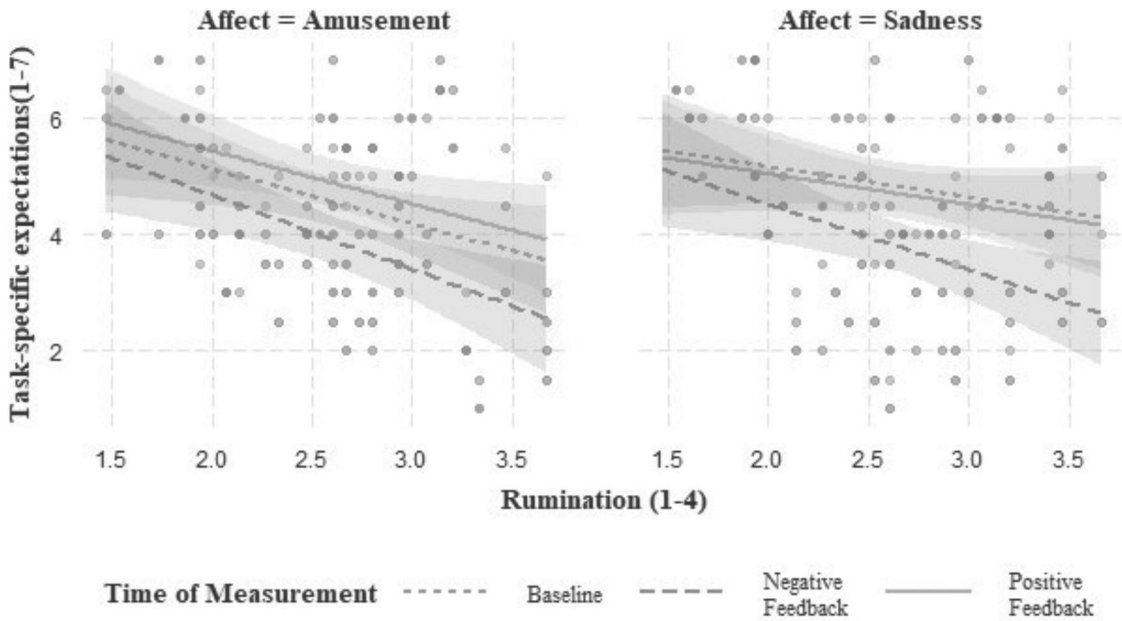


Fig. 4 Regression line between task-specific expectations (at baseline versus after receiving negative and positive feedback) and rumination in participants who either received an induction of amusement (left) or an induction of sadness (right panel)

showing that expectation change decreases if the discrepancy between expectations and information is too large. Additionally, among those participants with positive baseline expectations, there was a non-significant trend with a medium effect size indicating that sadness was related to more pronounced expectation change in response to negative feedback. This is in line with a recent study showing that sadness reduces the optimistic update bias, meaning that under acute sadness people are more prone to integrate negative information than they usually are; thus, acute sadness is thought to reduce one's "psychological immune system" (Karnick et al., 2023).

Regarding affect regulation, model comparisons showed that rumination, dampening of positive feelings and suppression of positive feelings had an additional exploratory value for performance expectations. Higher scores on the respective scales were associated with lower expectations. These results are consistent with findings about associations between altered affect regulation and biased cognition in depression (Everaert et al., 2020; Gross, 2002; Joormann & Stanton, 2016). On a descriptive level, there were hints that higher levels in rumination, dampening and suppression were also related to altered expectation change among sad but not among amused participants. This finding indicates that especially in sadness maladaptive affect regulation may lead to biased expectation change. However, our results do not allow us to draw any firm conclusions about the role of affect regulation on the change in expectations.

Implications for Future Research

Our findings have important implications for future research on expectation change in depression. We think that our results point out to the need to further explore the impact of baseline expectations as (a) baseline expectations may alter the openness for positive vs. negative feedback and (b) this may additionally depend on state affect. Thus, the investigation of cognitive and affective responses that are triggered through respective inductions of baseline expectations and their influence on expectation change could be worthwhile. Furthermore, our results suggest that emotion-eliciting film clips only induced amusement or sadness for a limited period of time, such that the induced affect had already disappeared by the time participants received the feedback. Therefore, it will be necessary for future studies to identify longer-lasting emotion-induction methods. Possibly, researchers may consider to instruct people to recall happy vs. sad memories as it is conceivable with reference to the impaired disengagement in depression (Koster et al., 2011) that once patients with depression start thinking about what went wrong in their lives, they have difficulty disengaging from it, such that the effects of such an instruction could last longer than those of a film clip.

Additionally, our results suggest the potential of the further exploration of affect regulation on expectation change. This is especially relevant since expectation violations can be considered as affective experiences and thus may trigger the use of affect regulation strategies. Building on a recent theoretical framework of Kube (2023a), maladaptive affect regulation such as dampening of positive feelings may lead to increased negative affect and a reduced ability to integrate positive experiences. This may amplify the persistence of negative expectations and in turn lead to sustained negative affect resulting in a vicious cycle (Smith et al., 2018). Thus, future research may consider the examination of the intercorrelation between reduced expectation change and sadness in depression and how this may be mediated by affect regulation.

Strengths and Limitations

To our knowledge, our study was the first to systematically investigate the effects of amusement vs. sadness on the integration of positive and negative feedback in depression. Further, we used a well-defined clinical sample, an established experimental task for the investigation of expectation change in depression, and preregistered both hypotheses and analysis plan.

Despite these strengths, an important limitation of the study is the relatively low sample size and the limited effect of the affect-manipulation, as described above. Furthermore, it should be noted that the complexity of the design in terms of manipulating baseline expectations, feedback, and affect may have led to some methodological issues, such as masking and sequence effects. For instance, it is conceivable that for some participants the initial information on whether the test is easy vs. difficult was more important for their updated expectations than the feedback received. Additionally, because the study was designed to gain a better understanding of the affective and cognitive mechanisms of feedback processing in depression, we did not include a non-depressed control group. Therefore, the present study does not allow any conclusions about how people with depression differ from non-depressed people.

Concluding Remarks

This study was designed to shed light on affective mechanism that promote vs. hinder expectation change in depression. As in previous studies, our results supported the hypothesis that people with depression are more prone to update their expectations in response to negative as compared to positive

information. Regarding the influence of state affect, there was no support for our hypothesis of a mood-congruency effect. However, there were hints in our data that baseline expectations and affect regulation may influence expectation change in sad participants with depression. Future studies using larger sample sizes and more enduring affect inductions are needed to draw robust conclusions about how sadness influences expectation change in depression.

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Declarations

Ethics Approval All procedures performed in this study were in accordance with the ethical standards of the institutional research committee and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards. The study was approved by the local ethics committee of the University of Landau (reference number 2019 – 216).

Consent to Participate Informed consent was obtained from all individual participants included in the study.

Consent to Publish Participants gave informed consent regarding publishing their data.

Competing Interests The authors declare that they have no conflict of interest.

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Anhang E: Artikel 5

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Better to keep a negative self-perception than ask for feedback? - How depressive symptoms are associated with the desire for social feedback

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ABSTRACT

Background: We investigated whether depressive symptom severity is associated with incongruence between how people perceive themselves (self-perception) and how they expect others to perceive them (meta-perception). We also examined whether these discrepancies explain feedback-seeking. We hypothesized that elevated depressive symptoms are related to low preference for positive and self-incongruent feedback and high preference for negative and self-congruent feedback.
Method: In study 1 ($N = 149$), we presented 20 positive and 20 negative traits. For each trait, participants rated their self- and meta-perception. In study 2 ($N = 212$), we presented the same traits. In addition to their self- and meta-perception, participants indicated their desire to receive other people's feedback for each trait.
Results: In study 1, depressive symptom severity was related to a higher incongruence between self- and meta-perception, as participants' self-perception was more negative than their meta-perception. Study 2 indicated that depressive symptom severity was related to less feedback-seeking. Incongruence between self-and meta-perception and valence did not moderate the relationship between depressive symptoms and feedback-seeking.
Conclusion: Depressive symptoms are associated with incongruence between self- and meta-perception and reduced feedback-seeking. However, incongruence between self- and meta-perception and valence did not explain reduced feedback-seeking in depression, emphasizing the importance to further investigate the causes for feedback avoidance in depression.

People suffering from depression often hold on to a negative self-view (Gara et al., 1993; Pietromonaco & Markus, 1985; Swallow & Kuiper, 1988). There is a growing body of research on biased belief updating dealing with the question of how a negative self-view is shaped and maintained and how this is associated with depression (Deng et al., 2022; Everaert et al., 2020; Garrett et al., 2014; Hobbs et al., 2022; Korn et al., 2014; Kube, 2023). The main findings from this field of research are that depression is associated with a tendency to devalue positive experiences, i.e., positive feedback, and to hold on to negative beliefs despite positive belief-disconfirming experiences. In these experimental tasks, participants are usually confronted with positive or negative information and it is investigated whether they update their beliefs in response to this information. Importantly, in these tasks, participants do not have a choice as to whether they want to receive a certain piece of information or remain ignorant, but they are presented with that information anyway. However, there is evidence from the field of information-seeking that people actively decide whether they want to receive a certain information or not and that they have different motives that drive their decisions (Sharot & Sunstein, 2020).

In the context of depression, the question of whether people seek vs. avoid feedback is especially relevant, since the avoidance of feedback may contribute to the persistence of a negative self-view and in turn may lead to a persistence or recurrence of depressive symptoms (Kube, 2023). In fact, it was shown that people with depressive symptoms do not avoid feedback in general, but they do prefer to seek self-consistent (negative) over self-enhancing (positive) feedback (Giesler et al., 1996; Wakeling et al., 2020). So called negative feedback-seeking is in turn associated with the maintenance of depressive symptoms (Borelli & Prinstein, 2006; Evraire & Dozois, 2011; Joiner, 1995) as well as to more negative evaluations by others, rejection by others and engagement in relationships with people that view oneself negatively (Joiner et al., 1993; Swann et al., 1992). This vicious circle of negative state affect and information seeking has also been examined in the field of anxiety by Reynolds et al. (2024) who have shown that state anxiety predicts

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negative feedback-seeking which in turn leads to increased state anxiety.

Regarding the question of why people sometimes seek and sometimes avoid feedback, two lines of theories have been proposed: theories of self-consistency and theories of self-enhancement (Kwang & Swann, 2010). According to theories of *self-consistency*, seeking self-consistent feedback is considered as reinforcing as it leads to certainty, which in turn helps people to make predictions, to guide their behavior and leads to a sense of coherence and control (Swann, 2012). This is in line with research from the field of information-seeking, which has shown that people prefer to receive information that confirms their existing beliefs over belief-inconsistent information (Jonas et al., 2001; Meppelink et al., 2019; Westerwick et al., 2017). *Self-enhancement* theories, on the other hand, consider the human need to obtain, maintain and increase a positive self-view as a dominant motive for feedback-seeking (Leary, 2007). For people with a positive self-view, these two theories are not necessarily mutually exclusive, as for people with a positive self-view, positive (self-enhancing) feedback is perceived as more self-consistent than negative feedback (Swann et al., 1987). For people with a negative self-view, however, such as people with depressive symptoms, self-consistent feedback is rather negative and as a result, not self-enhancing, as described above (Giesler et al., 1996).

However, in order to decide whether to seek self-consistent vs. self-enhancing feedback, people need to have an idea of how others perceive them and an expectation of how others would provide feedback to them (i.e., whether positive or negative feedback is to be expected). Beliefs about how others perceive oneself are referred to as meta-perception (Vries et al., 2022). Research has shown that people can distinguish between meta-perception and self-perception, i.e. they are aware of the fact that their self-perception may differ from their meta-perception (Carlson & Furr, 2013). The question arises as to which intrapersonal factors lead to discrepancies between self- and meta-perception and how this affects interpersonal behavior such as feedback-seeking. A. T. Beck et al. (2001) proposed that people with depressive disorders, as opposed to people with anxiety disorders, view themselves more negatively than they expect others to view them, implying that their self-perception is more negative than their meta-perception. To our knowledge, there is no further research that investigates discrepancies between self- and meta-perception in relation to depressive symptoms. Thus, we first conducted a study in which we investigated whether there are differences in the incongruence between self- and meta-perception as a function of depressive symptom severity (study 1).

Based on the results of study 1, we set up another study in which we investigated whether the incongruence between self- and meta-perception and valence of feedback are related to feedback-seeking and whether depressive symptoms moderate this relation (study 2). In doing so, we aligned with the paradigm of Kelly and Sharot (2021) who investigated individual differences in feedback-seeking. They developed a task where participants have to rate how much they want to know how significant others had rated them on a set of traits. Thereby, the cognitive, hedonic, and instrumental utility of the respective information was assessed. The assessment of cognitive, hedonic and instrumental utility was based on a theoretical approach by Sharot and Sunstein (2020). In their approach, Sharot and Sunstein (2020) argue that people are driven by different motives when deciding whether they want to receive or avoid certain information. In this decision process, people may estimate an information's impact on their actions (will this information help, hinder or have no influence on the ability to receive reward or avoid harm, i.e., instrumental utility), on their affect (will the information influence one's affect in a positive or negative way, i.e., hedonic utility), and on their cognition (will this information help to improve one's understanding, i.e., cognitive utility). Each of these three estimates can be positive (which would correspond to the desire to receive information), negative (which would correspond to the desire to avoid an information) or zero (which would create indifference). As predicted by the theoretical approach, Kelly and Sharot (2021) found that feedback-seeking was best explained when taking hedonic, instrumental and cognitive utility into account. For this reason, we also explored the additional exploratory value of hedonic, instrumental and cognitive utility for feedback-seeking in study 2.

1. Study 1

1.1. Method

All data, analysis code, and research materials are available at osf.io/fxhe4 (Rapo, 2025). The local ethics committee (reference number LEK398) approved the study. Study design, hypotheses and analysis plan were preregistered at 'AsPredicted' (https://aspredicted.org/PX4_PJV). All participants gave written informed consent.

1.1.1. Participants

We determined the required sample size performing a sensitivity-analysis for a linear multiple regression using G*Power Version 3.1.9.7 (Faul et al., 2009). We defined a type-one-error of $\alpha = .05$ and a power of $1\text{-}\beta = 0.80$, five predictors and an anticipated sample size of $N = 150$ resulting in a medium effect of $f^2 = 0.053$. Assuming a medium effect was reasonable in our view based on the following rationale. There were no previous studies examining the association between self-perception and meta-perception in relation to depressive symptoms, so we could not adhere to prior work specifically addressing this question. Instead, we followed the approach proposed by A. T. Beck et al. (2001), suggesting that people with depression view themselves more negatively than they expect to be viewed by others. Thus, given the lack of specific prior work, we aimed for a sample size which would allow us to detect a medium effect, following a pragmatic approach. Inclusion criterium was a minimum age of 18 and fluency in German. We recruited $N = 161$ participants from June 2022 to March 2024 via the e-mail distribution list of the RPTU Kaiserslautern-Landau. Eleven participants were excluded due to failures in correctly answering the control items and one person was excluded because they were under age resulting in a final sample of $N = 149$ (112 female, 35 male, 2 diverse[1]). Their age ranged from 18 to 65 years ($M = 25.77$, $SD = 8.70$). BDI-score indicated mild depressive symptoms ($M = 14.62$, $SD = 10.75$). 46.67 % of participants reached a score of $\geq$14, indicating a potentially clinically relevant depressive symptom severity.

1.1.2. General procedure

The study was conducted online via www.soscisurvey.de. For a total of 40 traits (20 positive, e.g., "adaptable" and 20 negative, e.g., "moody") participants had to answer the following questions on a VAS-scale ranging from 0 to 100.

- Subjective valence-rating: How positive do you rate this trait? (ranging from "not positive at all" to "very positive")
- Subjective valence-rating: How negative do you rate this trait? (ranging from "not negative at all" to "very positive")
- Self-perception: How much do you think this trait applies to you? (ranging from "not at all" to "very much")
- Confidence regarding self-perception: How confident are you concerning your self-rating? (ranging from "not confident at all" to "very confident")
- Meta-Perception: How do you think significant others (e.g. family/friends) will rate you in terms of this trait? (ranging from "trait is does not at all apply to me" to "trait very much applies to me")
- Confidence regarding meta-perception: How confident are you concerning your evaluation on how others would rate you? (ranging from "not confident at all" to "very confident")

[1] We define gender as socially constructed roles, behaviors and identities of women, men and gender-diverse people.

Subsequently, all traits were presented again and participants had to rate how relevant each trait is to them ("How important is it to you that this trait applies or does not apply to you?") on a VAS scale from 0 ("not important at all") to 100 ("very important).

Finally, depressive symptoms using the German version of the Beck-Depression-Inventory revised (BDI-II; Hautzinger et al., 2009b), as described below, and sociodemographic variables (gender, age, educational level, occupational status and level of German skills) were assessed.

1.1.3. Traits

Traits were selected from a pool of 93 traits collected from Allport and Odbert (1936) and J. S. Beck and Beck (2011). We pretested all 93 traits regarding their valence and their relevance for depression. We selected 20 traits that were rated as negative and 20 traits that were rated as positive. When selecting the traits, we made sure that the negative and positive traits were comparable in terms of the intensity of valence and relevance for depression, as described in the supplementary material.

1.1.4. Depressive symptoms

We assessed depressive symptoms using the German translation of the *Beck-Depression-Inventory Revised Version* (*BDI-II*; Hautzinger et al., 2009a). The *BDI-II* consists of 21 items, each measuring the manifestation of typical symptoms of depression on a scale from 0 to 3. High sum scores on the scale indicate high severity of depressive symptoms. In our sample, internal consistency was excellent ($\alpha = .93$).

1.1.5. Statistical analyses

We conducted a linear mixed model with an interaction of depressive symptom severity (metric: BDI-score) and valence of trait (categorial: positive vs. negative) as fixed effect. Subjects and traits were specified with random intercepts. Valence was included in the random slope of subjects and was thus allowed to vary across subjects. Dependent variable was incongruence between self- and meta-perception (deviation between VAS-score of self- and VAS-score of meta-perception). We computed person mean centering for all metric variables.[2] We tested the model regarding the assumptions of linearity, homogeneity of variance, collinearity, normality of residuals, normality of random affects as well as influential observations. Data were analyzed using R Studio Version 4.2.2 (R Core Team, 2022) using the following packages: pacman (Rinker & Kurkiewicz, 2018), tidyverse (Wickham et al., 2019), ggpubr (Kassambara, 2022a), reshape2 (Wickham, 2007), psych (Revelle, 2022), lme4 (Bates et al., 2015), lmerTest (Kuznetsova et al., 2017), emmeans (Lenth, 2023).

1.2. Results

We tested whether depressive symptom severity and valence of trait were significantly related to incongruence between self- and meta-perception. There was a large significant main effect of depressive symptom severity, $F(1, 147) = 31.68$, $p < .001$, $\eta_p^2 = 0.18$, 95 % CI [0.08, 0.28], and a small significant interaction effect of depressive symptom severity and valence of trait, $F(1,147) = 8.29$, $p = .005$, $\eta_p^2 = 0.05$, 95 % CI [0.01,0.14], indicating that with increasing levels of depressive symptom severity, incongruence between self- and meta-perception increased ($b_1 = 0.14$) and this was especially prevalent for negative traits ($b_1 = 0.06$; see Fig. 1).[3]

A further graphical exploration of the data suggested that with increasing levels of depressive symptom severity self-perception was more negative than meta-perception (see Fig. 2).

1.3. Interim discussion

Our results confirmed that depressive symptom severity is related to an incongruence between self- and meta-perception, as with increasing levels of depressive symptom severity the incongruence increased. Further, our results showed that with increasing depressive symptom severity, participants' self-perception was more negative than their meta-perception, that is, they expected others to see them more positively and less negatively than they saw themselves. This is in line with the results of A. T. Beck et al. (2001), who found that people with clinical depression view themselves more negatively than they expect others to view them. This finding raises the question of how this discrepancy between self- and meta-perception affects feedback-seeking, as people tend to seek information that they expect to be consistent with their prior beliefs and avoid information that is potentially inconsistent (Jonas et al., 2001; Meppelink et al., 2019; Westerwick et al., 2017). Applying these findings on feedback-seeking, the discrepancy between self- and meta-perception could explain the tendency of people with depression to avoid positive feedback (Wakeling et al., 2020). For clinical psychology, this is especially relevant as this avoidance may prevent people with depression from adjusting their self-views in a positive direction and may thus contribute to the maintenance of depressive symptoms.

2. Study 2

Based on the results of study 1, we conducted study 2 to examine how depressive symptom severity, valence and incongruence between self- and meta-perception relate to feedback-seeking. In particular, we aimed to test the following hypotheses.

1. The incongruence between self- and meta-perception is related to feedback-seeking: The greater the incongruence, the less participants want to know how others would view them (theory of self-consistency).
2. Valence of expected feedback is related to feedback-seeking: Participants prefer positive over negative feedback (theory of self-enhancement).
3. There is an interaction between incongruence, valence, and depressive symptom severity: With increasing levels of depressive symptom severity, positive feedback-seeking decreases and negative feedback-seeking increases.

With reference to Sharot and Sunstein (2020), we further examined the additional exploratory value of hedonic, instrumental, and cognitive utility on feedback-seeking.

2.1. Method

We report how we determined our sample size, all data exclusions and all measures in the study. All data, analysis code, and research materials are available at osf.io/fxhe4 (Rapo, 2025). The local ethics committee (reference number LEK398) approved the study. Study design, hypotheses and analysis plan were preregistered at 'AsPredicted' (https://aspredicted.org/8G4_K5B). All participants gave written informed consent.

2.1.1. Participants

We determined the required sample size for a linear multiple regression using G*Power Version 3.1.9.7 (Faul et al., 2009). We defined a type-one-error of $\alpha = .05$ and a power of $1\text{-}\beta = 0.80$. Based on the literature on feedback seeking in depression (Wakeling et al., 2020), we estimated an effect size of $f^2 = 0.08$ for a three-way-interaction between

[2] Person mean centering: Subtracting each participant's average score on a variable from their individual scores in order to distinguish between between- and within-person effects.

[3] The regression terms are additive (regression model: incongruence ~ BDI + valence + BDI*valence).

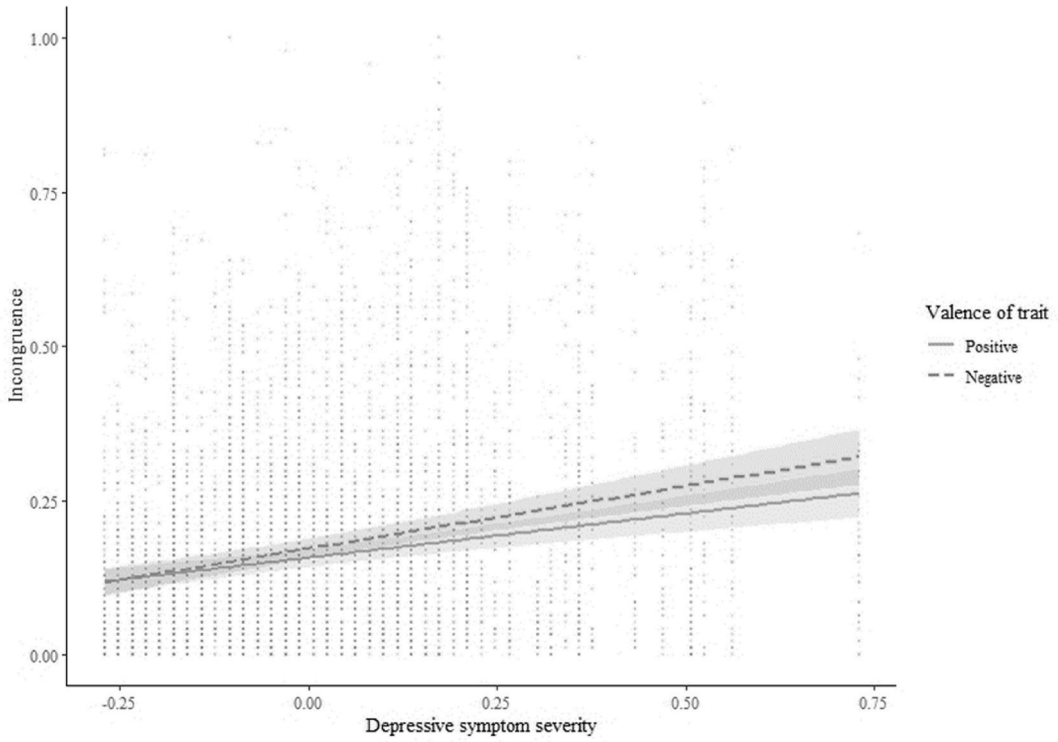


Fig. 1. Incongruence between self-and meta-perception for positive vs. negative traits in relation to depressive symptom severity.
Note. All values are person mean centered. Non-centered descriptive values of incongruence: $M = 15.49$ ($SD = 14.9$) and depressive symptom severity: $M = 14.75$ ($SD = 10.75$).

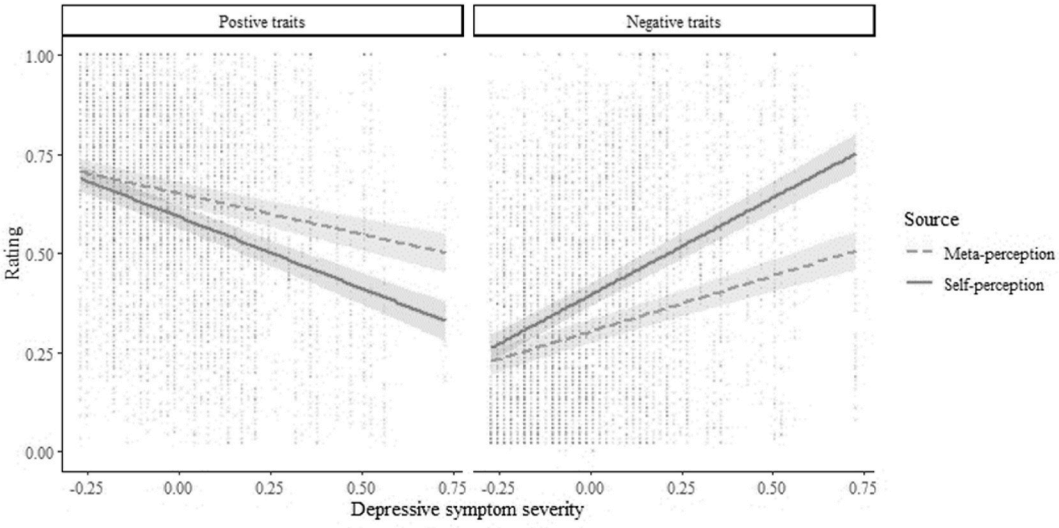


Fig. 2. Ratings of self-perception and meta-perception for positive vs. negative traits in relation to depressive symptom severity.
Note. All values are person mean centered. Non-centered descriptive values of meta-perception - positive traits: $M = 65.34$ ($SD = 23.46$), self-perception - positive traits: $M = 59.37$ ($SD = 23.87$), meta-perception - negative traits: $M = 29.89$ ($SD = 24.5$), self-perception - negative traits: $M = 39.28$ ($SD = 26.76$) and depressive symptom severity: $M = 14.75$ ($SD = 10.75$).

depressive symptom severity, valence of trait, and incongruence. As a result, the required sample size was $N = 141$. Inclusion criteria were a minimum age of 18 and fluency in German. We recruited $N = 228$ participants from June 2023 to March 2024 via the e-mail distribution list of the RPTU Kaiserslautern-Landau. Fifteen participants were excluded due to implausible response patterns and one participant because they were under age resulting in a final sample of $N = 212$ (156 female, 55 male, 1 diverse). Their age ranged from 18 to 68 years ($M = 26.91$, $SD = 9.22$). BDI-scores indicated no clinically relevant depressive symptoms averaged over the whole sample ($M = 12.71$, $SD = 10.49$). However, 38.68 % of participants reached a score of ≥14, indicating a potentially clinically relevant depressive symptom severity.

For an overview of the sample characteristics, see Table 1.

2.2. General procedure

The study was conducted online via www.soscisurvey.de. The procedure is an adapted version of the task of Kelly and Sharot (2021). First

Table 1
Sample characteristics.

Variable	
Age in years, *M (SD)*	26.91 (9.22)
Gender, *N (%)*	
Male	55 (25.94)
Female	156 (73.59)
Diverse	1 (0.47)
Highest educational level, *N (%)*	
School diploma	9 (4.24)
Qualification for university entrance	193 (91.04)
Other	10 (4.72)
Employment status, *N (%)*	
Student/In training	153 (72.17)
Employee	44 (20.76)
Self-employed	2 (0.94)
Other	13 (6.13)
BDI-II, *M (SD)*	12.71 (10.49)

participants were asked to imagine that significant others had rated them on 20 positive (e.g., "adaptable") and 20 negative (e.g., "moody") traits and to rate how much they would want to know how others had rated them using VAS scales from 0 ("I definitely don't want to know") to 100 ("I definitely want to know."). The traits were presented in a randomized order. We used the same traits as in study 1.

Subsequently, participants had to answer the following questions for each trait on a VAS scale from 0 to 100.

- Self-perception: How much do you think this trait applies to you? ("not at all" to "very much")
- Meta-perception: How do you think significant others (e.g. family/friends) will rate you in terms of this trait? ("trait does not apply to me at all" to "trait very much applies to me")
- Instrumental utility: How useful would it be to know how others rated you on this trait? ("not useful at all" to "very useful")
- Hedonic utility: How would you feel if you would know how others rated you on this trait? ("very bad" to "very good")
- Hedonic utility: How would you feel if you would never know how others rated you on this trait? ("very bad" to "very good")
- Cognitive utility: How often do you think about this trait? ("never" to "very often").

Depressive symptom severity and sociodemographic variables were assessed as in study 1. Internal consistency of the *BDI-II* (Hautzinger et al., 2009b) was excellent (α = .93).

2.3. Statistical analysis

Data were analyzed using R Studio Version 4.2.2 (R Core Team, 2022) using the following packages: pacman (Rinker & Kurkiewicz, 2018), tydiverse (Wickham, 2007), ggpubr (Kassambara, 2022a), reshape2 (Wickham, 2007), psych (Revelle, 2022), utils (R Core Team, 2022), car (Fox & Weisberg, 2019), lme4 (Bates et al., 2015), lmerTest (Kuznetsova et al., 2017), emmeans (Lenth, 2023), broom (Robinson et al., 2022), effectsize (Ben-Shachar et al., 2020), datarium (Kassambara, 2019), patchwork (Pedersen, 2023), devtools (Wickham, 2007), simr (Green & MacLeod, 2016), rstatix (Kassambara, 2022b), mosaic (Pruim et al., 2017).

2.3.1. Replication of study 1

We conducted a linear mixed model with an interaction of depressive symptom severity (metric: BDI-score) and valence of trait (categorial: positive vs. negative) as fixed effects. Subjects and traits were specified with random intercepts. Valence was included in the random slope of subjects and was thus allowed to vary across subjects. Dependent variable was incongruence between self- and meta-perception (deviation between VAS-score of self- and VAS-score of meta-perception). We computed person mean centering for all metric variables.

2.3.2. Main analysis

For hypothesis 1 and 3, we computed a linear mixed model with an interaction of incongruence between self- and meta-perception (metric: deviation between VAS-score of self- and VAS-score of meta-perception) and depressive symptom severity (metric: BDI-score) as a fixed effect. Subjects and traits were specified as random intercepts. We included incongruence between self- and meta-perception in the random slope of subjects, thus incongruence was allowed to vary across subjects. Dependent variable was feedback-seeking (metric: VAS-score). We separated within-vs. between-person effects and computed person mean centering for all metric variables. We tested the model regarding the assumptions of linearity, homogeneity of variance, collinearity, normality of residuals, normality of random effects as well as influential observations.

For hypotheses 2 and 3, we computed a linear mixed model with the interaction of valence (deviation between VAS-score of self- and VAS-score of meta-perception) and depressive symptom severity as a fixed effect. We operationalized valence using the following rationale: We defined feedback as positive if meta-perception was more positive than self-perception, i.e. if self-perception for negative traits was higher than meta-perception, or self-perception for positive traits was lower than meta-perception, respectively. Valence and depressive symptom severity were defined as variable of interests. Subjects and traits were defined as random intercepts. We included valence in the random slope of subjects, thus valence was allowed to vary across subjects. Dependent variable was feedback-seeking (VAS-score). We separated within-vs. between-person effects and computed person mean centering for all metric variables. We tested the model regarding the assumptions of linearity, homogeneity of variance, collinearity, normality of residuals, normality of random effects as well as influential observations.

2.3.3. Exploratory analysis

Hedonic, instrumental and cognitive utility. To examine the additional exploratory value of cognitive, instrumental and hedonic utility, we performed model comparisons. That is, we computed a model comparison including a null model, a basic model with depressive symptom severity as only predictor and seven models each allowing for different combinations with cognitive, instrumental and hedonic utility as additional fixed effects. Subjects and traits were defined as random intercepts. Cognitive, instrumental and hedonic utility were included in the random slope of subjects and were thus allowed to vary across subjects. We separated between- and within-person-effects and computed person mean centering for all metric variables. Dependent variable was feedback-seeking.

Valence of traits. Given the results of study 1, which revealed an interaction between valence of traits and depressive symptom severity on incongruence between self- and meta-perception, we decided to compute an additional analysis as an exploratory, data-driven approach. Therefore, we computed a linear mixed model with an interaction of depressive symptom severity (metric: BDI-II-score) and valence of trait (categorial: positive vs. negative) as well as incongruence between self- and meta-perception (metric: deviation between VAS-score of self- and VAS-score of meta-perception) as fixed effects. Subjects and traits were specified as random intercepts. We included an interaction of valence of trait and incongruence between self- and meta-perception in the random slope of subjects and incongruence between self- and meta-perception in the random slope of trait, thus the interaction term was allowed to vary across subjects and incongruence was allowed to vary across traits. We separated between- and within-person-effects and computed person mean centering for all metric variables. Dependent variable was feedback-seeking (metric: VAS-score). We tested the model regarding the assumptions of linearity, homogeneity of variance, collinearity, normality of residuals, normality of random affects as well as influential observations.

3. Results

3.1. Replication of study 1

We tested whether depressive symptom severity and valence of trait were significantly related to incongruence between self- and meta-perception. There was a large effect of depressive symptom severity, $F(1,210) = 52.74$, $p < .001$, $\eta_p^2 = 0.20$, 95 % CI [0.11,0.29], indicating that with increasing depressive symptom severity, incongruence between self- and meta-perception increased ($b_1 = 0.19$). Further, there was a significant interaction between depressive symptom severity and valence of trait, $F(1,210) = 17.20$, $p < .001$, $\eta_p^2 = 0.08$, 95 % CI [0.02,0.15], reflecting a medium effect and indicating that with increasing depressive symptom severity there was a larger increase of incongruence between self- and meta-perception for negative than for positive traits ($b_1 = 0.08$). Thus, we were able to replicate the results from study 1. A further graphical exploration demonstrated that, as in study 1, with increasing levels of depressive symptom severity self-perception was more negative than meta-perception, as detailed in the supplementary material.

3.2. Main analysis

Hypothesis 1. Is incongruence between self- and meta-perception related to feedback-seeking? We hypothesized that with increasing incongruence between-self and meta-perception feedback-seeking would decrease. There was no significant main effect of incongruence, neither for between-subjects, $F(1,208) = 0.83$, $p = .363$, $\eta_p^2 = 0.005$, 95 % CI [0.00,0.04], nor for within-subjects, $F(1,189.14) = 0.95$, $p = .330$, $\eta_p^2 = 0.005$, 95 % CI [0.00,0.04].[4]

Hypothesis 2. Is valence of feedback related to feedback-seeking? We hypothesized that participants would prefer positive over negative feedback. There was no significant effect of valence on feedback-seeking, neither for between-subjects, $F(1,207.89) = 0.03$, $p = .826$, $\eta_p^2 = 0.0003$, 95 % CI [0.00,0.003], nor for within-subjects, $F(1,197.18) = 0.02$, $p = .896$, $\eta_p^2 < 0.001$, 95 % CI [0.00,0.01].

Hypothesis 3. Is depressive symptom severity related to feedback-seeking and is this moderated by incongruence and valence of feedback? There was a small significant main effect of depressive symptom severity, $F(1,208.04) = 7.84$, $p = .006$, $\eta_p^2 = 0.04$, 95 % CI [0.003,0.098], indicating that with increasing depressive symptom severity feedback-seeking decreased ($b_1 = -0.21$). There was no significant interaction of valence and depressive symptom severity, between-subjects: $F(1,207.90) = 0.01$, $p = .939$, within-subjects: $F(1,154.81) = 0.19$, $p = .665$, and there was no significant interaction of incongruence and depressive symptom severity, between-subjects: $F(1,142.66) = 0.00$, $p = .995$, within-subjects: $F(1,208) = 1.67$, $p = .198$. For a graphical summary of results see Figs. 3 and 4.

3.3. Exploratory analysis

Hedonic, instrumental and cognitive utility are related to feedback-seeking. To examine the additional exploratory value of cognitive, instrumental and hedonic utility, we performed model comparisons comparing a model with simply depressive symptom severity as a fixed effect to a null-model and to seven models each allowing for different combinations with cognitive, instrumental and hedonic utility as additional fixed effects (see Table 2). The winning model allowed all three factors, cognitive, instrumental and hedonic utility, as additional fixed effects, indicating that feedback-seeking can be best explained when taking cognitive, instrumental and hedonic utility into account. With increasing hedonic (between-subjects: $b_1 = 0.37$, within-subjects: $b_1 = 0.18$) and instrumental (between-subjects: $b_1 = 0.30$, within-subjects: $b_1 = 0.10$) feedback-seeking increased significantly (hedonic utility, between-subjects: $F(1,204.46) = 4.39$, $p = .037$, $\eta_p^2 = 0.02$, 95 % CI [0.01,0.07], hedonic utility, within-subjects: $F(1,167.99) = 30.86$, $p \leq .001$, $\eta_p^2 = 0.16$, 95 % CI [0.07,0.25], instrumental utility between-subjects: $F(1,210.05) = 16.50$, $p \leq .001$, $\eta_p^2 = 0.07$, 95 % CI [0.02,0.15], instrumental utility within-subjects: $F(1,190.95) = 36.77$, $p \leq .001$, $\eta_p^2 = 0.16$, 95 % CI [0.08,0.25]. There was no significant between-subjects-effect for cognitive utility, $F(1,208.03) = 0.22$, $p = .637$, however there was a significant within-subjects-effect, $b_1 = 0.09$, $F(1,214.19) = 29.29$, $p \leq .001$, $\eta_p^2 = 0.12$, 95 % CI [0.05,0.20]. A further graphical exploration of the data revealed, that all three factors had a simple additive effect and did not interact with depressive symptom severity (see Fig. S2 in the supplementary material).

Valence of traits and depressive symptom severity interact as a function of feedback-seeking. As a data-driven, exploratory approach, we tested whether depressive symptom severity, valence of trait and incongruence were significantly related to feedback-seeking. There was a large significant main effect of valence of trait, $F(1,86.08) = 64.06$, $p < .001$, $\eta_p^2 = 0.43$, 95 % CI [0.27,0.55], indicating that participants preferred feedback regarding positive traits over feedback regarding negative traits. There was no significant main effect of depressive symptom severity, $F(1,209.41) = 1.42$, $p = .235$, and incongruence, $F(1,205.64) = 1.18$, $p = .278$. However, there was a significant interaction between depressive symptom severity and valence of trait, $F(1,210.58) = 6.70$, $p = .010$, $\eta_p^2 = 0.03$, 95 % CI [0.002,0.089], reflecting a small effect. This interaction indicates that with increasing levels of depressive symptom severity feedback-seeking decreased especially for positive traits and less so for negative traits. The interaction between depressive symptom severity and incongruence between self- and meta-perception, $F(1,206.96) = 2.68$, $p = .103$, and valence of traits and incongruence, $F(1,204.80) = 0.22$, $p = .637$, was non-significant. There was no significant three-way interaction between depressive symptom severity, valence of trait and incongruence between self- and meta-perception, $F(1,206.83) = 1.05$, $p = .307$. For a graphical summary see Fig. S3 in the supplementary material.

4. Interim discussion

The results of study 2 fully replicated the findings from study 1 regarding the association of depressive symptoms with self- and meta-perception. However, the results regarding valence and incongruence in relation to feedback-seeking did not support our hypotheses. Specifically, although we found that elevated depressive symptoms were related to less feedback-seeking, neither valence nor incongruence between self- and meta-perception could explain the association between depressive symptom severity and feedback-seeking. We will discuss these findings in relation to the theories of *self-enhancement* (Leary, 2007) and *self-consistency* theory (Jonas et al., 2001; Meppelink et al., 2019; Westerwick et al., 2017) in detail below.

5. Discussion

The present work aimed to investigate whether a) depressive symptom severity is associated with incongruence between self- and meta-perception and b) whether incongruence between self- and meta-perception and valence of feedback moderate the association between depressive symptom severity and feedback-seeking. In line with a previous study (A. T. Beck et al., 2001), we found that depressive symptom severity was associated with incongruence between self- and meta-perception: with increasing levels of depressive symptom severity participants' self-perception was more negative than their meta-perception. This can be considered as a robust finding as it results

[4] That is, there was no difference in feedback-seeking in dependence of incongruence, neither within the same individuals nor when looking at differences between all participants.

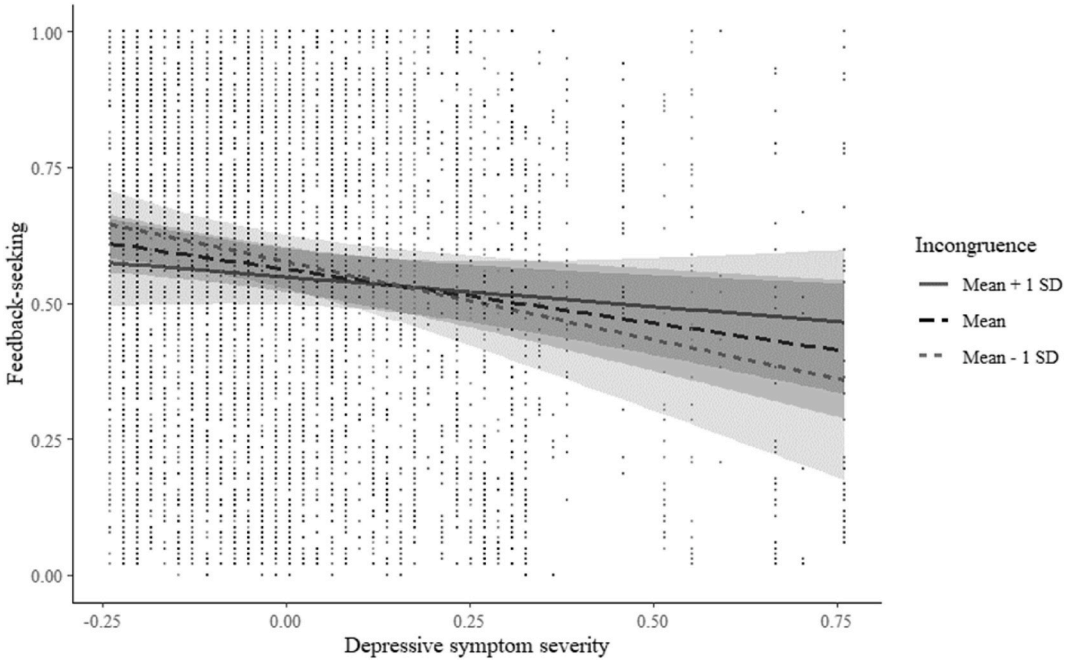


Fig. 3. Feedback-seeking in relation to incongruence between self- and meta-perception and depressive symptom severity.
Note. This figure displays between-subjects-effects. All values are person mean centered. Non-centered descriptive values of feedback-seeking: $M = 57.13$ ($SD = 33.24$), incongruence: $M = 14.62$ ($SD = 15.83$) and depressive symptom severity: $M = 12.71$ ($SD = 10.49$).

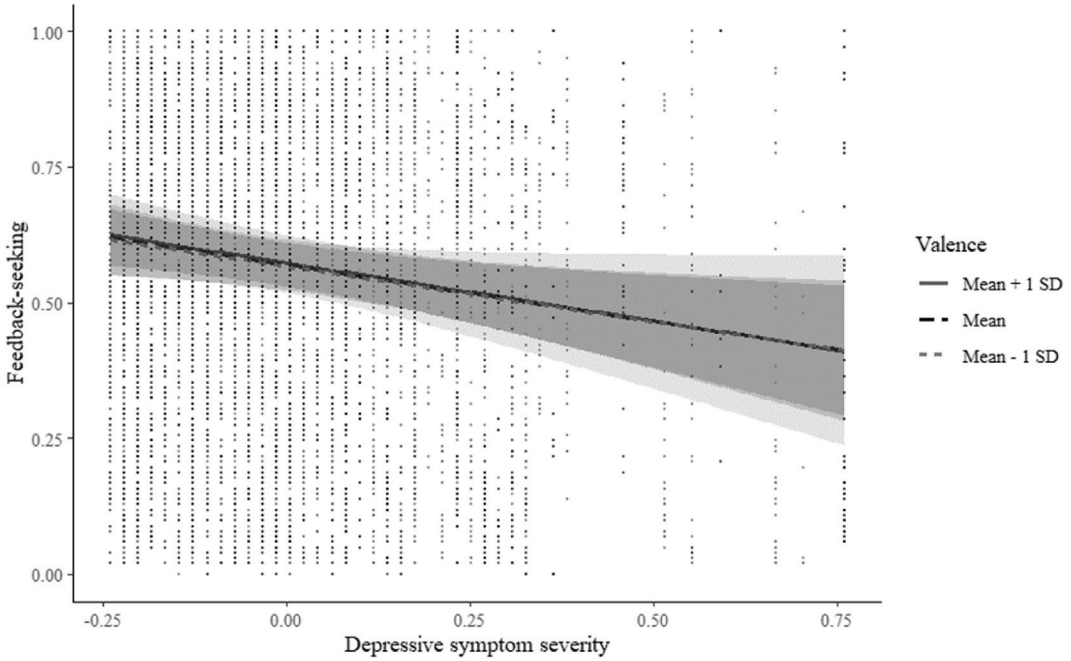


Fig. 4. Feedback-seeking in relation to valence and depressive symptom severity.
Note. This figure displays between-subjects-effects. All values are person mean centered. Non-centered descriptive values of feedback-seeking: $M = 57.13$ ($SD = 33.24$), valence: $M = 4.5$ ($SD = 21.07$) and depressive symptom severity: $M = 12.71$ ($SD = 10.49$).

from both our studies.

We suggest that this fairly novel finding can be interpreted as follows. The fact that people with elevated levels of depression view themselves more critically than they expect others to aligns well with research pointing to increased self-criticism in depression (Ehret et al., 2015). In addition, it may be that people with higher depressive symptom severity think that others do not know them well enough to see their flaws, which is why they expect to be viewed more benevolently by others. This discrepancy between self- and meta-perception can also be related to existing theories: Following the theory of *self-enhancement,* the association of depressive symptom severity with the tendency to view oneself more negatively than one expects to be viewed by others would imply that elevated depressive symptoms are associated with more feedback-seeking as participants would expect self-enhancing positive feedback. With regard to the theory of *self-consistency,* however, it would imply that elevated depressive symptoms would be associated with less

Table 2
Model comparison.

Fixed effects	R^2 (cond.)	R^2 (marg.)	ICC	RMSE	AIC	BIC	Performance-Score
DSS + hedonic + cognitive + instrumental	0.522	0.099	0.471	0.216	1.00	1.00	96.35 %
DSS + hedonic + cognitive	0.513	0.069	0.477	0.220	$3.76e^{-33}$	$5.69e^{-24}$	58.79 %
DSS + cognitive + instrumental	0.509	0.085	0.463	0.220	$3.99e^{-36}$	$6.054e^{-27}$	52.47 %
DSS + hedonic + instrumental	0.507	0.095	0.455	0.221	$1.24e^{-40}$	$1.87e^{-31}$	49.31 %
DSS + cognitive	0.494	0.035	0.476	0.226	$9.12e^{-89}$	$6.15e^{-72}$	46.82 %
DSS + hedonic	0.488	0.056	0.458	0.228	$5.94e^{-96}$	$4.01e^{-79}$	38.80 %
DSS + instrumental	0.492	0.081	0.447	0.226	$2.55e^{-76}$	$1.72e^{-59}$	37.90 %
DSS	0.464	0.015	0.456	0.236	$7.77e^{-163}$	$5.13e^{-140}$	23.85 %
Null model	0.463	0.000	0.463	0.723	0.00	0.00	9.03 %

Note. DSS = Depressive symptom severity.

feedback-seeking as participants would expect self-inconsistent feedback. This is in line with our results, which indicate that with increasing depressive symptom severity participants showed less feedback-seeking. However, contrary to our hypothesis and previous research (Giesler et al., 1996; Jonas et al., 2001; Leary, 2007; Meppelink et al., 2019; Wakeling et al., 2020; Westerwick et al., 2017), valence of feedback and incongruence between self- and meta-perception did not moderate the relationship between depressive symptom severity and feedback-seeking. Thus, our results did not resolve the question of which factors contribute to reduced feedback-seeking in people with depressive symptoms. In this regard, our findings neither support the theory of *self-consistency* (Swann, 2012) nor the *theory of self-enhancement* (Kwang & Swann, 2010). They are also inconsistent with research investigating negative feedback-seeking in depression, which indicates that depressive symptoms are associated with a strengthened approach of negative feedback (Wakeling et al., 2020).

Thus, the question remains which factors may account for the reduced interest in feedback by others in people with elevated levels of depression. Possibly, this is related to a general lack of interest in social interactions or even more broadly to a lack of motivation to engage in any activities which are perceived as effortful (i.e., anhedonia), both reflecting core components of depressive symptoms (Pizzagalli, 2014). Relatedly, the reduced interest in feedback by others can be conceived of as a form of avoidance behavior, which is also typical for people with elevated levels of depression (Brockmeyer et al., 2015; Trew, 2011). This suggestion regarding avoidance behavior would be in line with a recent qualitative study showing that patients with depression hold on to negative self-beliefs because they worry that lifting their expectations increases the risk of future disappointments (Kube & Rauch, 2025). To test the validity of these suggestions, we encourage future research to assess the aforementioned variables (i.e., lack of social interest, anhedonia, avoidance) when re-applying the current feedback-seeking task.

The inconsistency of our results with previous research could be due to our operationalization, which differed from previous studies in the following aspect.

In previous studies, valence of feedback was mostly operationalized through the *Feedback-Seeking Questionnaire* (*FSQ*; Swann et al., 1992), which asks participants about their preference for feedback regarding open questions covering 6 domains (e.g., intellectual and social) other people had answered about them (e.g., positive: "Why would this person be fun to be with?", negative: "Why would this person have trouble getting along with others?"). Thus, in these studies, valence was independent of participants' self-perception and meta-perception and was defined by default. In our study, however, we operationalized valence as well as incongruence as the degree of the deviation between self- and meta-perception. Thus, valence and incongruence were both very individualized variables. This could have led to the following masking effects: The deviation between self- and meta-perception ($M = 14.62$, $SD = 15.83$) in our sample may have been too small to derive a significant valence or incongruence effect from it. In this respect, it should be noted that with increasing depressive symptom severity participants reported more negative self-as well as meta-perception. This suggests that, even though meta-perception was more positive than self-perception, meta-perception of dysphoric participants was still negative, which could also explain reduced feedback-seeking (e.g., by fear of negative evaluation).

Further, in studies using the *FSQ* (Swann et al., 1992), participants have to select two out of six questions from each of the six domains on which they would like to receive feedback from. For each domain, three questions are framed positively and three questions are framed negatively. Thus, in previous studies, participants did not have a choice as to whether they want to receive or avoid feedback, but they were able to choose whether they wanted to receive feedback on a positively vs. negatively framed question. In our study, however, participants were asked *how much* they wanted to know and they did not have to choose between traits for which they would receive feedback.

Procedures of previous studies using the *FSQ* (Swann et al., 1992) offer the advantage of investigating actual feedback-seeking behavior. In contrast, our study only investigated hypothetical feedback-seeking behavior, which might differ from actual behavior. Previous research has provided evidence on how depressive symptom severity relates to negative feedback-seeking if participants can choose to receive positive vs. negative feedback. However, it does not provide evidence on how participants would decide if they had the option to receive no feedback at all. In our view, an advantage of our methodological approach is that it can close this gap by leaving participants a maximum freedom of choice.

In an exploratory approach, we also found that, as in previous research (Kelly & Sharot, 2021), hedonic, cognitive, and instrumental utility additionally explained feedback-seeking, indicating that feedback-seeking was stronger if feedback a) was expected to make participants feel better, b) related to a trait participants often thought about or c) was considered to be useful. This is also in line with previous work investigating different motives of feedback-seeking such as perceived value of feedback, trust in the person providing the feedback or perceived costs, such as shame or fear of evaluation (Hays & Williams, 2011). However, in our exploratory approach, depressive symptom severity did not interact with hedonic, cognitive and instrumental utility. This is only partially in line with the findings of Kelly and Sharot (2021), which revealed that depressive symptoms were associated with cognitive utility, but not with hedonic or instrumental utility in explaining information-seeking.

In another exploratory analysis, we found that valence of traits significantly interacted with depressive symptom severity, i.e., with increasing levels of depressive symptom severity participants feedback-seeking decreased in general, but especially feedback-seeking regarding positive traits (vs. negative traits). This fits with the above mentioned previous research investigating negative feedback-seeking in depression, which showed that people with depressive symptoms avoid feedback regarding positively framed questions (Wakeling et al., 2020). Further, this is consistent with previous research, which showed that depressive symptoms were differentially related to the update of beliefs about positive vs. negative self-traits (Kube & Korn, 2025).

5.1. Strengths and limitations

To our knowledge, our studies were the first to systematically investigate how depressive symptoms are related to the incongruence between self- and meta-perception and how this is associated with feedback-seeking. Further, our study design was developed based on a well-established task by Kelly and Sharot (2021) and we preregistered both hypotheses and the analysis plan.

Despite these strengths, an important limitation of the study is that we operationalized feedbacking-seeking as a hypothetical variable, meaning that we did not measure actual feedback-seeking behavior, but instead asked participants about how much they would want to know what others think about them. Further, the studies lacked a well-defined clinical sample. Instead, we assessed depressive symptom severity using self-report questionnaires. In addition, there are constraints on generality as we did not compute sex or gender-sensitive analyses and used a predominantly student sample.

Another limitation results from our power analysis, which was computed for detecting interaction effects. However, the resulting sample size might have been insufficient to reliably detect higher-order interaction effects. In study 2, we tried to compensate this issue by using a larger sample than suggested by our a-priori power analysis. A further limitation regarding the assessment tools pertains to the assessment of cognitive utility in study 2. The operationalization, which asked participants how frequently they think about each trait, was adopted from Kelly and Sharot (2021), arguing that people attribute more cognitive utility to an information relating to concepts that are frequently activated in their mental models. However, we acknowledge that this may be just one aspect of cognitive utility and other relevant domains (e.g., the degree to which an information is considered as valid, or the degree to which an information improves one's understanding or knowledge) were not considered.

Further, the studies did not control for anxiety symptoms, which could also account for anomalies in feedback-seeking, especially social anxiety. Anxiety might be an important factor to control for as reduced feedback seeking might be also due to anxious behavior such as avoidance. In fact, there is literature demonstrating the relation between state anxiety and anomalies in feedback-seeking (Reynolds et al., 2024).

5.2. Implications

Our findings have important implications for future research on feedback-seeking in depression. The results point to the importance of further exploring why depressive symptoms are associated with a reduced interest in feedback and how this impacts actual feedback-seeking behavior. For example, it could be worthwhile to explore which motives for feedback-seeking could lose their relevance through elevated depressive symptoms and thus lead to a reduced interest in feedback. Further, to shed light on the discrepancies between our results and results of previous studies, it could be helpful to investigate the association between how much people want to know what others think about them and their actual feedback-seeking behavior. In this regard, it could also be worthwhile to include contextual variables that may lead to discrepancies between "wanting to know" and actual feedback-seeking behavior. For example, in our study, we asked participants how much they wanted to know how significant others (i.e., friends and family) had rated them. Friends and family, however, do not cover all social contexts that may be impaired through depressive symptoms. Further relevant interaction partners, could be: teachers, classmates, co-workers, supervisors, new acquaintances, (potential) dating partners, and so on. Finally, to derive robust conclusions about feedback-seeking in depression, a replication of this study using a well-defined clinical sample is needed.

A potentially important clinical implication of our findings pertains to the reduced desire for feedback-seeking in people with elevated levels of depression. Though not explicitly measured in this study, it is plausible that if people with elevated depressive symptoms have a reduced desire to ask for feedback, they also actually engage in less feedback-seeking. Thus, they may have less opportunity to acquire belief-disconfirming experiences and, as a result, their negative self-views may further stabilize. This proposition would be consistent with recent theoretical accounts of depression, which emphasize the lack of disconfirming experiences and self-reinforcing negative predictions as a key aspect of depression (Barrett et al., 2016; Kube et al., 2020). Hence, an important implication for practitioners is that patients with depression may need particularly much encouragement to ask other people for feedback in order to have the opportunity to obtain belief-disconfirming positive information.

On the other hand, the results indicate that people with elevated levels of depression are actually aware of the fact that others might perceive them in a more positive way than they perceive themselves. Thus, they may be aware that engaging in feedback-seeking may result in the receipt of better-than-expected information. We had hypothesized that this reduced desire for feedback-seeking results from the fact that gathering positive information is expected to cause discomfort due to its incongruency with the self-view. However, since the current findings did not identify (lack of) congruence (nor valence) as a driving factor in this regard, it remains an open question what factors underlie the reduced feedback-seeking in depression.

In any case, even if people with depression were to engage in feedback-seeking behavior, they may not automatically integrate the potential feedback into their self-view, according to research on biased belief updating in depression (Kube, 2023). In this context, cognitive (e.g., questioning the credibility of the source; Panitz et al., 2021; Rief et al., 2015), affective (i.e., negative affect hinders belief updating; Kube & Glombiewski, 2021; Kube et al., 2023) as well as neurophysiological (deficient processing of unexpected rewards; Kumar et al., 2018; Segarra et al., 2016; Spaeth et al., 2024) factors may be relevant. These factors could also be relevant in explaining the discrepancy between self- and meta-perception in people with depressive symptoms: Maybe people with depressive symptoms question the credibility of feedback received by significant others ("They are just trying to comfort me."), or negative affect and neurophysiological anomalies hinder the integration of how others view themselves into their self-view. Thus, as a practitioner, it may be important to be aware that it is not only important to encourage patients to engage in potentially rewarding experiences (e.g., by asking for feedback), but also address the factors that may hinder the successful integration of positive experiences (Rief & Glombiewski, 2016; Wilhelm et al., 2022).

5.3. Concluding remarks

This work includes two studies that were designed to shed light on how incongruence between self- and meta-perception and valence of feedback explain feedback-seeking in relation to depressive symptom severity. Consistent with prior work (A. T. Beck et al., 2001), our results show that with increasing depressive symptom severity, the incongruence between self- and meta-perception increased. Further, our results highlight that with increasing depressive symptom severity, feedback-seeking decreases. Contrary to our hypothesis and previous studies, though, incongruence between self- and meta-perception did not explain this decrease in feedback-seeking in people with higher depressive symptom burden. Further, valence of feedback unexpectedly did not predict feedback-seeking. Future studies using a well-defined clinical sample are needed to draw robust conclusions about feedback-seeking in depression.

CRediT authorship contribution statement

Edith Rapo: Writing – original draft, Visualization, Validation, Supervision, Software, Project administration, Methodology, Investigation, Formal analysis, Data curation, Conceptualization. **Christopher**

Milde: Writing – review & editing, Visualization, Validation, Methodology, Formal analysis, Data curation. **Julia Anna Glombiewski:** Writing – review & editing, Validation, Resources. **Tobias Kube:** Writing – review & editing, Validation, Supervision, Software, Resources, Project administration, Methodology, Investigation, Funding acquisition, Conceptualization.

Author note

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Declaration of competing interest

The authors declare the following financial interests/personal relationships which may be considered as potential competing interests: Tobias Kube reports financial support was provided by German Research Foundation. If there are other authors, they declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Acknowledgements

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Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.brat.2025.104872.

Data availability

I have uploaded the data in an osf file, the link can be found in the manuscript

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Anhang F: Lebenslauf

AKADEMISCHE AUSBILDUNG

Mai 2022 - September 2026	Promotionsstudium an der Rheinland-pfälzischen technischen Universität Kaiserslautern-Landau, Landau
Oktober 2019 - September 2024	Weiterbildungsstudiengang in Psychologischer Psychotherapie (WiPP), Landau
Oktober 2017 - September 2019	Master of Science in Psychologie an der Universität Koblenz-Landau, Landau
September 2017 - Dezember 2017	Auslandssemester an der University of Limerick, Limerick (Irland)
Oktober 2014 - September 2017	Bachelor of Science in Psychologie an der Universität Koblenz-Landau, Landau
Oktober 2013 - Februar 2014	Studium der Tiermedizin ohne Abschluss an der Ludwig-Maximilians-Universität, München
2010 - 2013	Abitur am St. Dominikus Gymnasium, Karlsruhe

PRAKTISCHE ERFAHRUNG

Seit Mai 2026	Selbstständige Psychologische Psychotherapeutin in ambulanter Praxis, Karlsruhe
Januar 2024 - März 2026	Psychologin in der AGJ-Tagesklinik Karlsruhe des AGJ-Fachverbands für Prävention und Rehabilitation in der Erzdiözese Freiburg e.V., Karlsruhe
April 2021 - Juni 2024	Psychotherapeutin in praktischer Ausbildung an der psychotherapeutischen Universitätsambulanz, WiPP, Landau
Januar 2021 - Dezember 2023	Wissenschaftliche Mitarbeiterin an der Rheinland-pfälzischen technischen Universität Kaiserslautern-Landau, Landau
Oktober 2019 - Dezember 2020	Psychologin in psychotherapeutischer Ausbildung in der psychosomatischen Fachklinik Celenus, Schömberg

Anhang G: CRediT-Statements zu den einzelnen Artikeln

Artikel 1:

Rapo, E., Rief, W., & Kube, T. (2023). Learning from other patients - A feasibility study to establish an ecologically valid paradigm to modify negative expectations in depression through authentic psychotherapeutic treatment reports. *Journal of Behavioral and Cognitive Therapy, 33*, 195-206. https:// doi.org/10.1016/j.jbct.2023.10.001

CRediT Rolle (englisch)	Autorin 1: Edith Rapo	Autor 2: Winfried Rief	Autor 3: Tobias Kube
1. Conceptualization	☒ supporting	☒ supporting	☒ lead
2. Data curation	☒ --	☐ --	☐ --
3. Formal analysis	☒ --	☐ --	☐ --
4. Funding acquisition	☐ --	☒ supporting	☒ lead
5. Investigation	☒ equal	☐ --	☒ equal
6. Methodology	☒ equal	☐ --	☒ equal
7. Project administration	☒ equal	☐ --	☒ equal
8. Resources	☐ --	☐ --	☒ --
9. Software	☒ lead	☐ --	☒ supporting
10. Supervision	☐ --	☒ supporting	☒ lead
11. Validation	☒ equal	☒ equal	☒ equal

12. Visualization	☒ --	☐ --	☐ --
13. Writing – original draft	☒ --	☐ --	☐ --
14. Writing – review & editing	☒ equal	☒ supporting	☒ equal

Landau, März 2026

Prof. Dr. Tobias Kube	Edith Rapo

Artikel 2

Kube, T., Rapo, E., Glombiewski, J. A., & Rief, W. (2025). How people with major depression adjust their expectations of future life events in response to other patients' reports of the positive effects of psychotherapy. *Behaviour Research and Therapy, 189*, 104736. https:// doi.org/10.1016/j.brat.2025.104736

CRediT Rolle (englisch)	Autor 1: Tobias Kube	Autorin 2: Edith Rapo	Autorin 3: Julia Anna Glombiewski	Autor 4: Winfried Rief
1. Conceptualization	☒ lead	☐ --	☐ --	☒ supporting
2. Data curation	☒ lead	☒ supporting	☐ --	☐ --
3. Formal analysis	☒ --	☐ --	☐ --	☐ --
4. Funding acquisition	☒ equal	☐ --	☐ --	☒ equal
5. Investigation	☒ supporting	☒ lead	☐ --	☐ --
6. Methodology	☒ equal	☒ equal	☐ --	☒ supporting
7. Project administration	☒ equal	☒ equal	☐ --	☐ --
8. Resources	☒ lead	☐ --	☒ supporting	☒ supporting
9. Software	☒ --	☐ --	☐ --	☐ --
10. Supervision	☒ lead	☒ supporting	☒ supporting	☒ supporting

11. Validation	☒ --	☐ --	☐ --	☐ --
12. Visualization	☒ --	☐ --	☐ --	☐ --
13. Writing – original draft	☒ --	☐ --	☐ --	☐ --
14. Writing – review & editing	☒ lead	☒ supporting	☒ supporting	☒ supporting

Landau, März 2026

_____ _____

Prof. Dr. Tobias Kube Edith Rapo

Artikel 3

Kube, T., Rapo, E., Houben, M., Gärtner, T., Brakemeier, E.-L., Glombiewski, J. A., & Rief, W. (2025). Differences between persistent and episodic depression in processing novel positive information. *Psychological Medicine, 55*, e261, 1-12. https://doi.org/10.1017/S0033291725101530

CRediT Rolle (englisch)	Autor 1: Tobias Kube	Autorin 2: Edith Rapo	Autorin 3: Mimi Houben	Autor 4: Thomas Gärtner	Autorin 5: Eva-Lotta Brakemeier	Autorin 6: Julia Anna Glombiewski	Autor 7: Winfried Rief
1. Conceptualization	☒ lead	☐ --	☐ --	☐ --	☒ supporting	☐ --	☒ supporting
2. Data curation	☒ lead	☒ supporting	☒ supporting	☐ --	☐ --	☐ --	☐ --
3. Formal analysis	☒ --	☐ --	☐ --	☐ --	☐ --	☐ --	☐ --
4. Funding acquisition	☒ equal	☐ --	☐ --	☐ --	☐ --	☐ --	☒ equal
5. Investigation	☒ equal	☒ equal	☒ equal	☒ supporting	☐ --	☐ --	☐ --
6. Methodology	☒ lead	☒ supporting	☒ supporting	☐ --	☒ supporting	☐ --	☒ supporting
7. Project administration	☒ equal	☒ supporting	☒ supporting	☒ supporting	☐ --	☐ --	☒ equal
8. Resources	☒ equal	☐ --	☐ --	☒ supporting	☐ --	☒ supporting	☒ equal
9. Software	☒ --	☐ --	☐ --	☐ --	☐ --	☐ --	☐ --
10. Supervision	☒ lead	☐ --	☐ --	☒ supporting	☒ supporting	☒ supporting	☒ supporting
11. Validation	☒ --	☐ --	☐ --	☐ --	☐ --	☐ --	☐ --

12. Visualization	☒ --	☐ --	☐ --	☐ --	☐ --	☐ --	☐ --
13. Writing – original draft	☒ --	☐ --	☐ --	☐ --	☐ --	☐ --	☐ --
14. Writing – review & editing	☒ lead	☒ supporting	☒ supporting	☒ supporting	☒ supporting	☒ supporting	☒ supporting

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Artikel 4:

Rapo, E., Milde, C., Glombiewski, J. A., & Kube, T. (2024). Understanding Biased Expectation Change in Depression - The Influence of State Affect and Affect Regulation. *Cognitive Therapy and Research, 49*, 34-49, https://doi.org/10.1007/s10608-024-10560-3

CRediT Rolle (englisch)	Autorin 1: Edith Rapo	Autor 2: Christopher Milde	Autorin 3: Julia Anna Glombiewski	Autor 4: Tobias Kube
1. Conceptualization	☒ equal	☐ --	☐ --	☒ equal
2. Data curation	☒ lead	☒ supporting	☐ --	☐ --
3. Formal analysis	☒ lead	☒ supporting	☐ --	☐ --
4. Funding acquisition	☐ --	☐ --	☐ --	☒ --
5. Investigation	☒ lead	☐ --	☐ --	☒ supporting
6. Methodology	☒ equal	☒ supporting	☐ --	☒ equal
7. Project administration	☒ equal	☐ supporting	☐ supporting	☒ equal
8. Resources	☐ --	☐ --	☒ equal	☒ equal
9. Software	☒ equal	☐ --	☐ --	☒ equal
10. Supervision	☒ supporting	☐ --	☐ --	☒ lead

11. Validation	☒ equal	☒ equal	☒ equal	☒ equal
12. Visualization	☒ lead	☒ supporting	☐ --	☐ --
13. Writing – original draft	☒ --	☐ --	☐ --	☐ --
14. Writing – review & editing	☒ equal	☒ supporting	☒ supporting	☒ equal

Landau, März 2026

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Prof. Dr. Tobias Kube Edith Rapo

Artikel 5:

Rapo, E., Milde, C., Glombiewski, J. A., & Kube, T. (2025). Better to keep a negative self-perception than ask for feedback? - How depressive symptoms are associated with the desire for feedback. *Behaviour Research and Therapy, 149*, https://doi.org/10.1016/j.brat.2025.104872

CRediT Rolle (englisch)	Autorin 1: Edith Rapo	Autor 2: Christopher Milde	Autorin 3: Julia Anna Glombiewski	Autor 4: Tobias Kube
1. Conceptualization	☒ equal	☐ --	☐ --	☒ equal
2. Data curation	☒ lead	☒ supporting	☐ --	☐ --
3. Formal analysis	☒ lead	☒ supporting	☐ --	☐ --
4. Funding acquisition	☐ --	☐ --	☐ --	☒ --
5. Investigation	☒ lead	☐ --	☐ --	☒ supporting
6. Methodology	☒ equal	☒ supporting	☐ --	☒ equal
7. Project administration	☒ equal	☐ supporting	☐ supporting	☒ equal
8. Resources	☐ --	☐ --	☒ equal	☒ equal
9. Software	☒ equal	☐ --	☐ --	☒ equal
10. Supervision	☒ supporting	☐ --	☐ --	☒ lead

11. Validation	☒ equal	☒ equal	☒ equal	☒ equal
12. Visualization	☒ lead	☒ supporting	☐ --	☐ --
13. Writing – original draft	☒ --	☐ --	☐ --	☐ --
14. Writing – review & editing	☒ equal	☒ supporting	☒ supporting	☒ equal

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Prof. Dr. Tobias Kube Edith Rapo

Anhang H: Eidesstattliche Erklärung

Hiermit erkläre ich, Edith Rapo, dass ich die beigefügte Dissertation selbstständig verfasst habe. Ich habe alle Quellen und Hilfsmittel, die ich in der Dissertation verwendet habe, aufgeführt. Die Beiträge meiner Co-Autor*innen sowie meine individuellen Beiträge zu den wissenschaftlichen Artikeln sind im Anhang detailliert aufgeführt. Verweise auf die Arbeiten und Theorien anderer sind vollständig und korrekt zitiert und gekennzeichnet. Die Dissertation wurde in dieser oder in einer ähnlichen Form weder an dieser noch an einer anderen Universität im In- oder Ausland zur Erlangung eines Doktorgrades eingereicht. Diese Erklärung wurde als eidesstattliche Erklärung abgegeben.

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Edith Rapo