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Psychotherapists' interoceptive awareness and accuracy

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Abstract

Objective: This study examined the different dimensions of interoception in psychotherapists to better understand the significance of interoception in therapeutic work.

Methods: Data on objectively defined interoceptive accuracy, response confidence and subjectively assessed interoceptive awareness were collected from psychotherapists. Forty Finnish psychotherapists varying in work experience and theoretical orientation participated in this field study. The interoceptive awareness of their clients ($n=67$) in individual psychotherapy was also assessed. The psychotherapists' interoceptive accuracy was compared with that of a reference sample of working adults ($n=38$). Data were analysed using mixed methods. The research approach was descriptive and pragmatic.

Results: The results showed statistically significantly higher interoceptive awareness in the psychotherapists than clients, which showed a large effect size: Cohen's $d=1.54$, 95% CI [1.10, 1.99]. However, the therapists' interoceptive accuracy did not differ from that of a reference sample of persons without therapy training, $d=0.06$, CI [-0.40, 0.53].

Conclusion: Expanding knowledge on interoception can help psychotherapists to develop professionally while supporting their psychological well-being. This study contributes to research on the role of interoceptive accuracy and awareness in embodied interaction in psychotherapy.

KEYWORDS

common factors, embodiment, interoceptive accuracy, interoceptive awareness, psychotherapist

1 | INTRODUCTION

The increasing prevalence of mental health problems has highlighted the need for psychotherapeutic assistance in a new and clear way, with a growing demand for knowledge about helpful therapeutic processes. In psychotherapy research, there is typically a focus on patient characteristics and therapeutic interventions. However,

until recently, the impact of therapist effect on the processes of change has received less attention. Nevertheless, a recent trend in psychotherapy research indicates a growing interest in the therapist effect, specifically examining how therapists' interpersonal and intrapersonal qualities influence the therapeutic interaction and alliance (e.g. Clements-Hickman & Reese, 2023; Heinonen, 2014; Heinonen & Nissen-Lie, 2020). The therapist effect is a considerable

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element of positive outcome in psychotherapy (Flückiger, 2022; Flückiger et al., 2018). We have approached this topic innovatively with a novel perspective and considered whether the therapist's ability to perceive and interpret their own bodily sensations may be related to the quality of the affective bond formed between the therapist and the client.

1.1 | Embodied interaction in psychotherapy

The therapist's embodiment and embodied interaction have been studied from various perspectives. Subjects of study have included, for example, the psychophysical aspects of the patient–clinician relationship (e.g. Del Piccolo & Finset, 2018; Kleinbub et al., 2020). To date, bodily synchrony between therapists and clients in several behaviours and autonomic nervous system signals, indicating that therapists naturally sense in their own body the physiological responses of their clients, has been investigated (e.g. Laitila et al., 2019; Seikkula et al., 2015) and autonomic nervous system synchrony between therapist and client is related to changes in the therapeutic alliance and client well-being (Tourunen et al., 2020; Tschacher & Meier, 2020). Qualitative studies conducted within various frameworks have examined the phenomenon of how psychotherapists engage in embodied listening with clients, indicating a developmental trajectory of this skill with accrued clinical experience (e.g. Shaw, 2004; Sletvold, 2016; Stange-Bernhardt et al., 2019). On the contrary, Putrino et al. (2020) described how therapists' subjective experiences of physiological reactions differ when treating patients with major depressive disorder compared with patients with a borderline personality disorder. While the bodily synchrony and role of bodily elements experienced in therapeutic interactions have been explored, less interest has been shown in the different dimensions of psychotherapists' interoception; that is, objectively measured ability of detecting their own internal bodily signals and the subjective experience of these sensations.

1.2 | Interoception

Interest in the awareness of autonomic nervous system-controlled changes in the body's physiology, namely interoception, has grown strongly over the past 20 years (Garfinkel et al., 2022). In neuroscience, interoception has recently been studied as a bidirectional process of sensing and interpreting between brain and body, with multiple feedback and feedforward loops (Berntson & Khalsa, 2021). The sensations considered to be interoceptive signals, such as satiety, muscular effort, gastrointestinal, respiratory, cardiac and temperature, are mainly visceral (e.g. Brewer et al., 2021; Khalsa & Lapidus, 2016; Nord & Garfinkel, 2022). Interoception has several separate dimensions and has been variously defined (e.g. Garfinkel et al., 2015; Murphy et al., 2019). Overlapping definitions hamper the formation of an overall picture of current knowledge. In this study, interoceptive accuracy (IAcc) is defined as the objectively measured

Implications for Practice and Policy

- Psychotherapists should be aware that the level of awareness they possess regarding their internal bodily experiences is not correlated with their accuracy in identifying internal bodily sensations as measured by a behavioural task. These phenomena are independent of each other.
- The level of confidence a psychotherapist holds in their observations does not correspond to their accuracy or awareness regarding internal bodily experiences. Consequently, self-assessment of observational accuracy presents challenges.
- When psychotherapists use internal bodily sensations as a source of information, these should be approached with an open-minded and exploratory attitude, akin to thoughts and emotions.
- The novel insights generated from interoception research should be integrated into psychotherapy training programmes and clinical supervision sessions for psychotherapists. This integration would enrich therapists' professional competence while enabling them to better attend to their own well-being.

ability to detect cardiac signals. In previous research, the term interoceptive sensibility is often used to describe self-reported beliefs about one's own interoception. Here, we adopt the more primary term response confidence, which refers to subjective beliefs about the ability to discriminate one's own heartbeat. Although interoceptive awareness (IAw) has traditionally been defined as confidence–accuracy correspondence, we chose to follow Mehling's (2016) definition. That is, IAw is a metacognitive ability, which involves two different components: the individual's attention style to their own internal bodily signals and the regulatory aspect of interoception as a result of the evaluative interpretation of perceived internal bodily sensations. The reason for adopting Mehling's definition and the Multidimensional Assessment of Interoceptive Awareness questionnaire lies in their aptness for integration within psychotherapy.

1.3 | Interoception studies related to psychotherapists and psychotherapy

Due to the associations between interoception and psychiatric symptoms, interoception studies have focussed on understanding the client's symptoms, while, to our best knowledge, the interoception of psychotherapists has remained nearly unexplored. In a pioneering study, Ovalle et al. (2023) investigated the correlation between interoceptive awareness and therapeutic style, finding that therapists who reported greater warmth and involvement towards

their clients demonstrated higher interoceptive awareness. On the contrary, Sands (2023) has theoretically connected interoception, exactly taken interoceptive awareness, to psychoanalysis.

However, previous interoception studies have highlighted factors closely associated with psychotherapy processes. For example, interoception is linked to empathy and feelings of compassion (e.g. Grynberg & Pollatos, 2015; Heydrich et al., 2021). Interoception also has a role in decision-making (e.g. Dunn et al., 2010; Herman et al., 2021; Tamura et al., 2022). Moreover, low-resilience individuals are less sensitive to body-relevant information (Haase et al., 2016), and higher IAcc is associated with lower long-term stress (Schultchen et al., 2019). A major focus of interoception research in the behavioural sciences has been the relationship between emotion regulation and interoception (e.g. the recent meta-analysis by Parrinello et al., 2022). It is also well-established that atypical interoception is associated with a risk for psychosomatic and psychiatric disorders (e.g. Brewer et al., 2021; Khalsa & Lapidus, 2016). Deviations in interpreting internal bodily signals are linked, for example, to anxiety disorders (e.g. Domschke et al., 2010; Yoris et al., 2015), schizophrenia (e.g. Ardizzi et al., 2016; Torregrossa et al., 2022), eating disorders (e.g. Herbert et al., 2013; Jenkinson et al., 2018; Richard et al., 2019) and major depressive disorder (e.g. Barrett et al., 2016; Eggart et al., 2019). Interoceptive interventions have shown positive outcomes for various types of psychiatric disorders (Khouri et al., 2018).

Previous studies have examined interoceptive accuracy in some professional groups. For instance, Schirmer-Mokwa et al. (2015) compared IAcc between professional musicians and non-musicians. The authors found that practising music explained about half of the variation in cardiac accuracy in the singers. IAcc was significantly higher in ballet dancers than non-dancers (Christensen et al., 2018). The authors suggested that while dance training might improve IAcc, it is also possible that it is easier for individuals with high IAcc to become dancers. Hypothetically, it can be considered that the therapist's interoceptive accuracy might also be connected to how their body resonates with the client's body. Studies on IAcc among psychotherapists have not, to the best of our knowledge, been conducted previously.

1.4 | Aim of the study

New knowledge of therapists' interoceptive awareness and accuracy is significant as they may have a role in the formation of therapeutic alliance.

In this study, we compared the level of IAw between therapists and their clients and the level of IAcc between therapists and a reference group of persons without therapy training. We also studied whether work experience or theoretical orientation contributed to different dimensions of interoception in our participants.

Although our goal was to conduct research in a natural psychotherapy context, measuring IAcc requires a laboratory-type set-up, which inevitably diverges from the normal situation. We chose to

analyse the data quantitatively using mixed methods, complemented with qualitative analysis (Johnson et al., 2007) of the therapists' subjective experiences and their potential effect on the quantitative measures, that is, interoceptive accuracy and response confidence.

2 | METHOD

2.1 | Research design

In this field study, IAcc was measured in psychotherapists with a heartbeat discrimination task (HDT), response confidence with self-ratings and IAw with the Multidimensional Assessment of Interoceptive Awareness Version 2 (MAIA-2) questionnaire. The IAw of their clients was also assessed with the MAIA-2 questionnaire. The psychotherapists' IAcc was also compared with that of a corresponding reference sample and their IAw with that of a general population sample.

2.2 | Participants

To obtain a representative sample of Finnish psychotherapists, 40 psychotherapists certified by the National Supervisory Authority for Welfare and Health in Finland (Valvira) were recruited through four different professional channels: Group 1 ($n = 11$) was drawn from the Finnish Association of Body-Oriented Psychotherapy; Group 2 ($n = 8$) from psychotherapists practicing in the psychiatry department of the Hospital District of South Ostrobothnia; Group 3 ($n = 10$) from psychotherapists practising privately in the South Ostrobothnia region; and Group 4 ($n = 11$) from a professional social media group of psychotherapists. These data were collected between April 2021 and October 2022.

All the participating therapists were native Finns. The psychotherapists varied from trainees to professionals with over 30 years' experience (Table 1). In the present sample, 25% of the therapists had completed at least two psychotherapy training programmes with different theoretical orientations. The theoretical orientation grouping was based on the first completed psychotherapy training programme.

The psychotherapists' IAcc data were compared against that of corresponding (unpublished) data gathered in 2022 from a reference sample of working adults ($n = 38$, age 32–63 years, 76% female participants) in the Department of Psychology, University of Jyväskylä.

The two reference samples used to study IAw comprised clients from whom similar data had been collected, and a general population sample from a Finnish validation study (Kettunen & Kätkä, 2021). Of the clients ($n = 67$), 60 identified as women and six as men, 19 were aged 20–29, 30 were 30–39, 14 were 40–49, and four were 50–59. At study start, 58.3% were employed, 16.7% were students, 11.7% unemployed, and 13.3% were on sick leave or retired. Data were missing for 10% of participants. Data on clinical diagnoses or ethnicity were not collected.

TABLE 1 Therapists' demographics, $n=40$.

| Therapists | <i>n</i> | % |
|------------------------------------|----------|------|
| Gender | | |
| Female | 36 | 90 |
| Male | 4 | 10 |
| Age | | |
| 30–39 years | 8 | 20 |
| 40–49 years | 13 | 32.5 |
| 50–59 years | 17 | 42.5 |
| 60+ years | 2 | 5 |
| Theoretical orientation | | |
| Psychoanalytic, –dynamic | 4 | 10 |
| Cognitive | 10 | 25 |
| Solution-focussed | 10 | 25 |
| Integrative, cognitive-analytic | 8 | 20 |
| Trauma | 6 | 15 |
| Others | 2 | 5 |
| Work experience as psychotherapist | | |
| Student | 4 | 10 |
| Less than 5 years | 13 | 32.5 |
| 5–9 years | 14 | 35 |
| 10–14 years | 6 | 15 |
| 15–19 years | 2 | 5 |
| More than 30 years | 1 | 2.5 |

The research procedure was approved by the University of Jyväskylä Ethical Committee (1592/13.00.04.00/2020). All participants provided their written informed consent prior to participating in the research.

2.3 | Measures

2.3.1 | Interoceptive accuracy

In this paper, IAcc refers to cardiac accuracy measured with a HDT. The task was modified from the experimental procedure used at the Center for Interdisciplinary Brain Research of the University of Jyväskylä (CIBR; Lyyra & Parviainen, 2018). The aim of the modification was to make the task easier to implement in natural work environments. The HDT included 16 one-minute observation periods separated by a 30-second interval. The ECG machine delivered synchronous tones 200ms after the heartbeat, that is, following the R-wave. Asynchronous tones were delivered with an additional 300ms delay, that is, 500ms following the R-wave. Immediately after each observation period, participants were asked whether they had perceived the tones as synchronous or asynchronous with their own heartbeat. Eight synchronised sets and eight delayed sets were administered in randomised order. The IAcc and response confidence data reported in this paper were from 34 therapists, as the data from six of the HDT were unacceptable due to disruption.

2.3.2 | Response confidence

At the end of each set, to indicate their confidence in the perceived accuracy of their response, participants were asked, 'How certain are you about this answer on a rating scale from one to five? One means that you guessed the answer; five means that you were very certain'. At the end of the HDT, the mean of the confidence ratings was calculated.

2.3.3 | Interoceptive awareness

I Aw was measured with the Multidimensional Assessment of Interoceptive Awareness Version 2 (MAIA-2) questionnaire. The MAIA-2 is a self-report questionnaire comprising 37 items rated on a 6-point Likert scale from 0 to 5 (Ferentzi et al., 2021; Mehling et al., 2018). Participants rate how often each statement, for example 'When I feel unpleasant body sensations, I occupy myself with something else so I don't have to feel them', applies to them generally. Higher scores indicate higher interoceptive bodily awareness (Freedman et al., 2021). The MAIA questionnaire was originally developed as an instrument for experimental interoception research (Mehling et al., 2012) and contains eight subscales: Noticing, Not-Distracting, Not-Worrying, Attention Regulation, Emotional Awareness, Self-Regulation, Body Listening and Trusting (Mehling et al., 2018). The questionnaire has been translated into Finnish and validated at the University of Eastern Finland (Kettunen & Kätkä, 2021).

2.4 | Procedure

This field research was conducted in the therapists' normal work environment, that is, their client reception area. After the HDT, participants were asked to rate their overall confidence in the task on a feedback form and to comment in writing on the test situation. The participants were also given an opportunity to discuss their experience of the test situation with the researcher. They were not given feedback on their performance.

2.5 | Data analysis

2.5.1 | Statistical analysis

Data were analysed using the IBM SPSS Statistics v28.0 software. *t*-tests for independent samples were used to compare IAw and its subscales between the psychotherapists and their clients. *t*-tests were also used to compare IAw between the psychotherapists and a general population sample, and IAcc between the psychotherapists and the reference sample. Due to small sample sizes, differences between the work experience groups were tested with independent-samples Mann–Whitney U tests. Spearman's correlations were performed to explore the associations between IAcc, response confidence,

I AW and the MAIA-2 subscales and the associations between the valence-based subgroups in subjective experience, IAcc and response confidence. Spearman's correlations were selected over Pearson's correlations as most of the variables had ordinal scales. The effect sizes were computed with www.psychometrica.de.

This correlation design is vulnerable to statistical errors due to the small sample size ($n=34$) and multiple comparisons. To control for type I errors, that is, false positives, a false discovery rate (FDR) procedure was conducted according to the Benjamini-Hochberg procedure in <https://tools.carbocation.com>. The 19 correlations relevant to the research questions were included, first those between IAcc, response confidence and IAW, and second those between IAcc, response confidence and MAIA subscales.

2.5.2 | Qualitative analysis

A qualitative analysis was conducted based on the feedback forms. The aim was to explore the subjective experience of taking part in a psychophysiological experiment (HDT) and its possible effect on IAcc and response confidence. The categorisation was done by the first author (SH) according to valence (2023), defined in the APA dictionary as 'the subjective value of an event, object, person, or other entity in the life space of the individual. An entity that attracts the individual has positive valence, whereas one that repels has negative valence'. Three separate groups were identified. Co-authors VLK and AL then independently categorised 20 feedback forms into these three groups. Forms which the first and the second assessors had grouped differently were then sent to a third assessor (VLK or AL) and finally placed in the valence group chosen by two of the three assessors.

2.5.3 | Mixed methods analysis

After creating the valence-based subgroups through qualitative analysis, the results of the qualitative and quantitative analyses were integrated, first by computing Spearman's correlations between the categories of valence, IAcc and response confidence, and second by testing the distributions of IAcc and response confidence across the categories of valence with the independent-samples Kruskal-Wallis test.

3 | RESULTS

3.1 | The dimensions of interoception in psychotherapists

The psychotherapists' IAcc, response confidence and IAW are shown in relation to their descriptive statistics in Table 2. IAcc varied widely across the sample, with a mean accuracy of 57.0%. For the HDT score to be statistically significantly greater than the default value, it

must be 75% or higher. Two of the 34 therapists scored 87.5%. The mean response confidence in this sample was 3.1 on a scale from 1 to 5. The mean IAW was 3.7 on a scale from 0 to 5. Two MAIA subscales, Emotional Awareness and Trusting, showed means above 4. The variation in the MAIA subscale Not-Distracting was wider than that of the other subscales.

3.2 | Interoceptive awareness between therapists and their clients

The therapists showed statistically significantly higher interoceptive awareness (MAIA-2 total) than their clients, $t(101)=8.32$, $p<.001$, $d=1.54$, 95% CI [1.10, 1.99] (Figure 1). The effect size is large (Cohen, 1988). Furthermore, the results of the independent-samples t -tests (Table 3) showed that the therapists differed statistically significantly from their clients in each MAIA-2 subscale. Comparison of the therapists' IAW with that found for the general population sample ($n=285$) in the Finnish validation study (Kettunen & Kätkä, 2021) also showed a statistically significant difference favouring the therapists, $t(109)=6.98$, $p<.001$, $d=0.67$, 95% CI [0.33, 1.00]. The effect size is medium (Cohen, 1988).

3.3 | Accuracy of psychotherapists and reference sample without therapy training

Next, we compared the IAcc data between the psychotherapists and the reference sample ($n=38$). Cardiac accuracy in the reference sample was measured with a HDT developed by Lyyra and Parviainen (2018) and ranged from 25.0% to 83.3%. The mean was 57.8%, standard deviation 12.4 and skewness -0.2 . Three subjects

TABLE 2 Descriptive statistics showing mean scores for the three dimensions of interoception and the MAIA-2 subscales, $N=34$.

| Variable | Range | Mean | SD | Skewness |
|---------------------------|-----------|------|------|----------|
| Accuracy (% correct) | 37.5–87.5 | 57.0 | 13.3 | 0.4 |
| Response confidence (1–5) | 1.0–4.3 | 3.1 | 0.9 | –0.7 |
| Awareness (0–5) | 2.9–4.4 | 3.7 | 0.4 | 0.1 |
| MAIA-2 subscales (0–5) | | | | |
| Noticing | 2.8–5.0 | 3.9 | 0.5 | –0.4 |
| Not-Distracting | 0.7–4.3 | 2.6 | 0.8 | 0.1 |
| Not-Worrying | 2.0–4.8 | 3.6 | 0.6 | –0.3 |
| Attention Regulation | 2.7–4.7 | 3.8 | 0.5 | –0.1 |
| Emotional Awareness | 3.6–5.0 | 4.3 | 0.4 | 0.2 |
| Self-Regulation | 2.0–4.8 | 3.6 | 0.7 | –0.6 |
| Body Listening | 2.3–5.0 | 3.6 | 0.8 | –0.1 |
| Trusting | 2.7–5.0 | 4.2 | 0.8 | –0.5 |

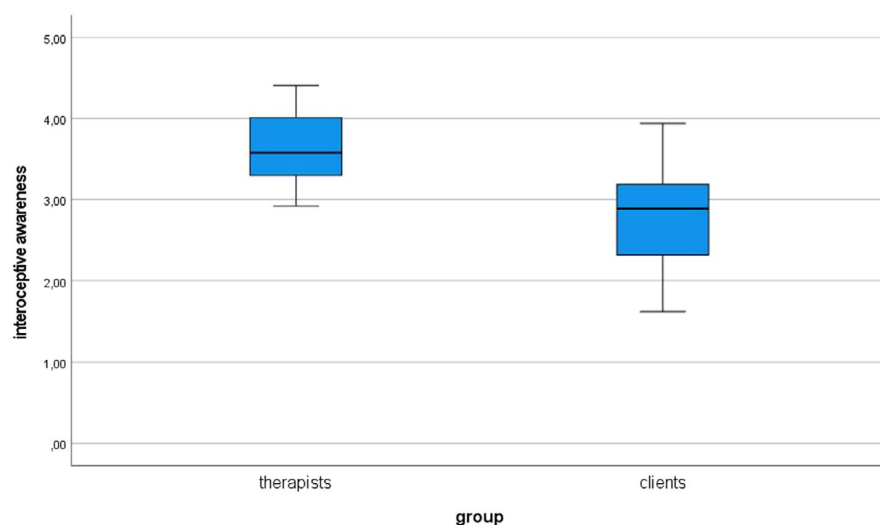


FIGURE 1 Illustration of the difference in interoceptive awareness between therapists ($n=40$) and their clients ($n=66$).

TABLE 3 Differences between therapists ($n=40$) and their clients ($n=66$) in MAIA-2 and its subscales.

| | Therapists | | Clients | | <i>p</i> | Cohen's <i>d</i> | CI 95% |
|----------------------|------------|----------|----------|-----------|----------|------------------|------------|
| | <i>M</i> | <i>M</i> | <i>t</i> | <i>df</i> | | | |
| Noticing | 3.8 | 3.3 | 3.84 | 103 | <.001 | 0.70 | 0.29, 1.10 |
| Not-Distracting | 2.6 | 1.9 | 4.42 | 104 | <.001 | 0.89 | 0.47, 1.30 |
| Not-Worrying | 3.6 | 2.9 | 5.06 | 98 | <.001 | 0.95 | 0.54, 1.36 |
| Attention Regulation | 3.8 | 2.9 | 6.88 | 104 | <.001 | 1.23 | 0.80, 1.65 |
| Emotional Awareness | 4.2 | 3.8 | 3.26 | 103 | <.001 | 0.58 | 0.17, 0.98 |
| Self-Regulation | 3.7 | 2.6 | 7.14 | 101 | <.001 | 1.32 | 0.88, 1.75 |
| Body Listening | 3.6 | 2.6 | 5.72 | 104 | <.001 | 1.15 | 0.72, 1.57 |
| Trusting | 4.1 | 2.7 | 7.52 | 102 | <.001 | 1.38 | 0.94, 1.81 |
| Total | 3.6 | 2.8 | 8.32 | 101 | <.001 | 1.54 | 1.10, 1.99 |

scored 75% or more. Comparison with an independent-samples *t*-test showed no difference in IAcc between the psychotherapists and the reference group $t(70) = -0.26, p = .793, d = 0.06, CI [-0.40, 0.53]$.

3.4 | Contribution to interoception of work experience and theoretical orientation

To be able to compare these variables in different subgroups, we converted the IAcc, response confidence and IAw results to *z*-scores. We found no increase with work experience in any of the three variables (Figure 2). The SDs for *z*-scores in the experience-based groups are presented in Table S1. An additional analysis was computed by dividing the therapists into two groups: work experience of less than 5 years ($n=14$) compared with work experience of 5 years or more ($n=20$). Due to small sample sizes, between-group differences were tested with independent-samples Mann-Whitney *U* tests. No differences were observed between these two experience-based groups in *z*-accuracy [$U(32) = 151.5, z = 0.41, p = .683, r = .07$], *z*-confidence [$U(32) = 124.5, z = -0.54, p = .587, r = -.10$], or *z*-awareness [$U(32) = 112.0, z = -0.98, p = .327, r = -.17$].

High scores in interoceptive accuracy, response confidence or interoceptive awareness were not associated with any specific theoretical orientation in the present sample of psychotherapists (Figure 3). The SDs for *z*-scores in the orientation-based groups are presented in Table S1.

3.5 | Associations between interoception dimensions and MAIA-2 subscales

Spearman's correlations were performed to explore the associations between IAcc, response confidence, IAw and the MAIA-2 subscales. As shown in Table 4, we found no statistically significant correlations between the major variables, that is, interoceptive accuracy, response confidence and interoceptive awareness. Although the association between IAcc and response confidence was not statistically significant, visual inspection of the scatter plot (Figure S1) indicated that an association cannot be entirely ruled out. The two correlational findings shown in Table 4 were a negative association between IAcc and self-regulation ($r = -.36, p = .035$) and a negative association between response confidence and trusting ($r = -.40, p = .019$).

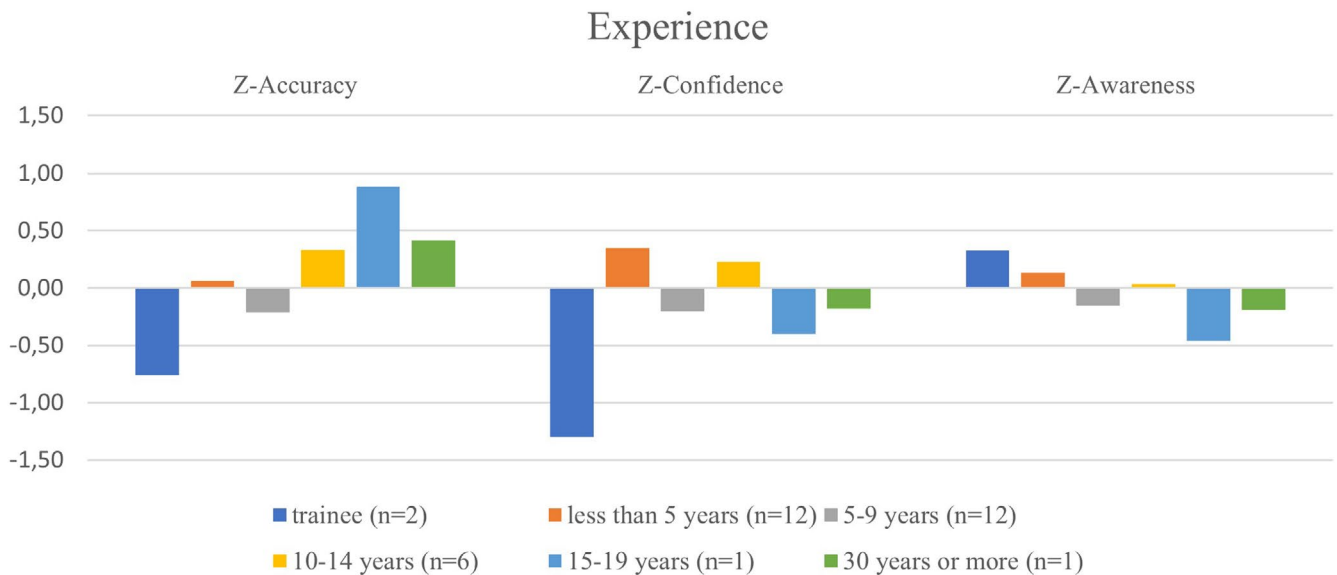


FIGURE 2 Differences in z-scores of interoceptive accuracy, response confidence and interoceptive awareness between the work experience groups.

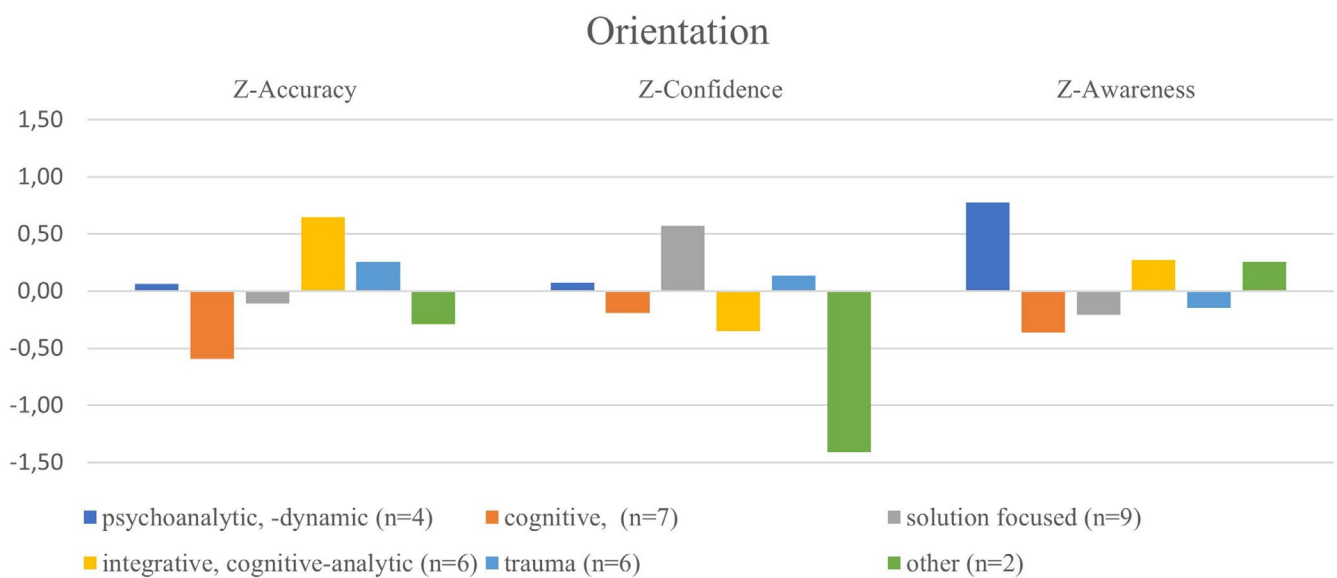


FIGURE 3 Differences in z-scores of interoceptive accuracy, response confidence and interoceptive awareness between the orientation groups.

The adjusted Benjamini-Hochberg p -value for both the association between IAcc and self-regulation and that between response confidence and trusting was $p = .333$ and hence non-significant using an FDR of 0.05.

3.6 | Subgroups of subjective experience

The qualitative analysis on the therapists' subjective experiences of taking part in the HDT yielded three distinct groups.

3.6.1 | Negative valence subgroup

This group ($n = 18$) reported the experience as uncomfortable or even negative, using adjectives such as 'distressing', 'frustrating' or 'challenging'.

'My initial assumption was that I observe my bodily signals, embodied reactions, muscular tensions and changes a lot, but it was surprisingly difficult to detect my heartbeat'.

TABLE 4 Correlation matrix (Spearman's correlation) illustrating the relationships between dimensions of interoception, $n=34$ (lower diagonal) and p -values (upper diagonal).

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
|------------------------|--------------|--------------|-------|-------|-------|------|-------|-------|-------------|-------|-------------|
| 1 Accuracy | – | .237 | .703 | .669 | .138 | .372 | .723 | .453 | .035 | .302 | .950 |
| 2 Confidence | .21 | – | .751 | .167 | .542 | .086 | .542 | .484 | .887 | .690 | .019 |
| 3 Awareness | .07 | –.06 | – | .003 | <.001 | .025 | <.001 | <.001 | <.001 | <.001 | <.001 |
| 4 Noticing | .08 | .24 | .49** | – | .360 | .925 | .001 | .487 | .133 | .027 | .065 |
| 5 Not-Distracting | .26 | –.11 | .71** | .16 | – | .335 | .047 | .017 | .297 | <.001 | .030 |
| 6 Not-Worrying | .16 | –.30 | .38** | –.02 | .17 | – | .148 | .148 | .384 | .167 | .014 |
| 7 Attention Regulation | –.06 | .11 | .82** | .53** | .34* | .25 | – | .026 | <.001 | <.001 | .004 |
| 8 Emotional Awareness | –.13 | –.12 | .63** | .12 | .41* | .25 | .38* | – | .001 | <.001 | .536 |
| 9 Self-Regulation | –.36* | –.03 | .67** | .26 | .18 | .15 | .72** | .53** | – | <.001 | .045 |
| 10 Body Listening | –.18 | –.07 | .89** | .38* | .64** | .24 | .70** | .71** | .69** | – | .008 |
| 11 Trusting | .01 | –.40* | .58** | .32 | .37* | .42* | .48** | .11 | .35* | .45** | – |

Note: * $p < .05$; ** $p < .01$. Significant correlations and p -values between the three dimensions of interoception and MAIA-2 subscales are bolded.

'It was difficult to detect one's own heartbeat when you couldn't palpate or see it'.

3.6.2 | Ambivalence subgroup

This group ($n=9$), reported the experience as ambivalent, using expressions such as 'interesting', 'trust in the body' alongside words such as 'difficult', 'uncomfortable'.

'A difficult, but interesting and instructive experience. Developed an image of the body and its functioning'.

'In a way, it felt easy to gain intuition, but then it was anyway difficult. At times it felt like changing from synchrony to delay in the middle of the set'.

3.6.3 | Positive valence subgroup

This group ($n=7$) described the experience positively, using adjectives such as 'interesting', 'addictive' or 'peaceful'.

'Intriguing. I'm more used to observing my breathing. Interesting, where you sense it: mostly I felt the heartbeat in my right wrist'.

'I tried to sense when I felt pleasant, peaceful, whole. I believe that this sensation was associated with synchrony'.

3.7 | Mixed methods findings

Spearman's correlations showed no associations of the subgroups of subjective experience with IAcc ($r = .21$, $p = .236$) or with response

confidence ($r = .22$, $p = .211$). The effect sizes were small. When tested with the independent-samples Kruskal–Wallis test, the distribution of IAcc was the same across the categories of valence [$X^2(2, 34) = 2.415$, $p = .299$], as also was the distribution of response confidence [$X^2(2, 34) = 2.664$, $p = .264$].

4 | DISCUSSION

This paper reports our study on trained psychotherapists' interoceptive awareness and accuracy. We compared therapists' and their clients' scores on IAw and its subscales. We also compared psychotherapists' IAcc scores with those of a reference group without therapy training. The results showed, first, that the psychotherapists scored significantly higher in IAw than their clients. Second, the psychotherapists' IAcc scores did not differ from those of the reference sample.

4.1 | The interoception of psychotherapists

The absence of correlations between objectively measured IAcc, response confidence and subjectively assessed IAw supports earlier findings that these are distinct dimensions of the phenomenon and hence should be considered separately. Comparing our results with previous studies is challenging, as concepts in the field of interoception research are not used systematically. For example, the concept of interoceptive sensibility (IS) commonly describes subjective beliefs about one's ability to focus on internal bodily sensations, assessed by measures such as the IAcc confidence ratings or questionnaires. However, correlations between such self-ratings are rare (Murphy et al., 2019). Moreover, no consensus has been reached on how interoception is defined from a psychotherapeutic point of view and how it relates to other areas of interoception research.

For example, Garfinkel et al. (2015) found no systematic correlation between IAcc and IS in a normative healthy population. In

their pioneering study, three dimensions of interoception proved to be distinct and dissociable. Correlations between IAcc and IAW have been found in patient groups but not among healthy controls (Pollatos & Georgiou, 2016). Moreover, the first network analytic study (Slotta et al., 2021) found no associations between IAcc and facets of IAW (i.e. the MAIA subscales). This means that while psychotherapists may subjectively assess themselves as highly aware of their internal bodily signals, objective measurements show that they perceive interoceptive stimuli inaccurately. Alternatively, while psychotherapists may be accurate in observing their internal bodily signals, they are, simultaneously, unsure of their perceptions. These results resonate with those previously documented by Legrand et al. (2022), indicating that cardiac interoceptive beliefs tend to be more biased, more inaccurate and associated with weaker metacognitive insight when compared to the interoceptive control condition. In psychotherapy, shifting from an internal (oneself) to external (client) focus, as in other social situations, may reduce the therapist's interoceptive processing ability (Arnold et al., 2019). When using bodily sensations as a source of information, therapists should be aware of these possibilities. The conclusion is that it is important to approach internal sensations as a source of information in psychotherapy with an open mind, curiosity and an exploratory attitude.

4.2 | Interoceptive awareness in psychotherapists

The main result of this study is that therapists' subjective experience of their internal bodily sensations was higher than that of their clients and that of a general population sample in Finland. The results should, however, be interpreted with caution due to the small sample sizes. In Ovalle et al.'s (2023) study, the level of interoceptive awareness, as measured by the MAIA-2, among 155 Chilean therapists was 3.1, whereas in our sample, it averaged 3.7. This raises the question of whether sample sizes, cultural differences or different therapeutic orientations contribute to explaining the difference. It is also important to bear in mind that the present results may be biased by the interest of the present sample of psychotherapists in taking part in body-oriented psychotherapy research.

In a prior study, the subjective experience of interoception was found to be positively associated with perceived well-being, whereas interoceptive accuracy was not (Ferentzi et al., 2019). Metacognitive processes related to a tendency to overestimate bodily signals have also been associated with anxiety, but not with higher IAcc (e.g. Krautwurst et al., 2014; Krautwurst et al., 2016; Yoris et al., 2015). Hence, IAW seems to be important for well-being, a finding in line with the importance of self-care behaviours in maintaining psychotherapists' well-being and decreasing their risk of burnout (van Hoy & Rzeszutek, 2022). Psychotherapists, like all individuals, react to internal bodily sensations. These reactions and their significance to the therapist influence the choices they make during therapy sessions. Even if the therapist is not actively aware of bodily sensations,

they implicitly affect the interaction. Self-reflective ability is a prerequisite for therapeutic work. If these sensations remain unreflected upon, the therapist may even make harmful choices during the therapy session.

4.3 | Interoceptive accuracy in psychotherapists

Since we found no difference between the trained psychotherapists and the reference sample without therapy training, we cannot conclude that persons with higher IAcc train as professional therapists or, conversely, that working as a psychotherapist improves one's IAcc. To confirm this result, a replication study with a larger sample of psychotherapists is required.

4.4 | Limitations and further research

The decision to conduct a field study limited the options available for the interoception accuracy task. Future investigations could consider exploring IAcc with a novel paradigm, as in Hodossy et al. (2021), who studied cardiac interoception in different types of engagement. Alternatively, IAcc could be measured using multiple modalities instead of cardiac accuracy alone (Ferentzi et al., 2018). In a larger sample of psychotherapists, the impact of work experience and theoretical orientation on interoception might become evident. In this study, reliable comparisons between different theoretical orientations were not possible due to small sample sizes in subgroups. Similarly, client clinical diagnoses and demographic details would have been relevant variables in relation to interoceptive awareness, and potentially influenced the effect size of this study. Therefore, it would be beneficial to control for these factors in future studies. Previous studies have suggested that therapeutic attunement could be improved by using self-report questionnaires, such as the MAIA-2 (Gehlen & Zimmer, 2022), and that IAcc can be improved by bodily interventions (Fischer et al., 2017). Therefore, further studies on psychotherapists that include embodied interventions would also yield valuable information on the role of interoception.

5 | CONCLUSION

Interoception is a multidimensional phenomenon, and further research is needed to better understand the role of its different dimensions as intrapersonal qualities of psychotherapists. These initial results indicate that interoceptive awareness appears to be a more significant characteristic of psychotherapists than interoceptive accuracy. For clinical implications, it seems relevant to further investigate how therapists use their internal bodily sensations. Another interesting question is whether therapists' interoceptive awareness or accuracy is related to the therapeutic alliance or the therapy outcome.

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CONFLICT OF INTEREST STATEMENT

All authors declare that they have no competing interest to disclose.

ETHICAL STATEMENT

All authors have reviewed the final version of the manuscript, agree with its submission and are responsible for all aspects of the work. Data are not shared due to privacy and ethical restrictions.

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SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

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