# FACTORS AFFECTING PLACEBO ACCEPTABILITY: DECEPTION, OUTCOME AND DISEASE SEVERITY

By

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To my family members, friends, and colleagues who have steadfastly supported me in this journey towards completing this academic and professional milestone

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## LIST OF ABBREVIATIONS

| | |
|---|---|
| ANOVA | Analysis of variance |
| B | Got better/improved |
| EA | Entirely acceptable |
| EP | Enhanced placebo |
| EU | Entirely unacceptable |
| FD | Full deception |
| MA | Marginally acceptable |
| NC | Remained the same/no change |
| NP | Non-progressive pain |
| $\eta p^2$ | Partial eta squared |
| PAF | Principle axis factoring |
| PP | Progressive pain |
| RA | Random assignment |
| VAS | Visual analogue scale |
| W | Worsened |

Abstract of Thesis Presented to the Graduate School
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A burgeoning body of evidence supports the efficacy and elucidates the mechanisms of placebo analgesia. Considerable debate persists, however, concerning the ethics of their use, with many of the present arguments being primarily philosophically-based. Given the magnitude of placebo analgesic effects and the frequency of physician-administered placebos, the present study empirically investigated the acceptability of an analgesic placebo treatment among lay individuals.

A total of 103 participants (*M* age = 22.67, *SD* = 4.57) completed a web-based study examining placebo attitudes and consequences by responding to vignettes depicting patients receiving a placebo analgesic. We experimentally manipulated 1) placebo treatment instructions (level of deception), 2) treatment outcome, and 3) patients' pain severity. Participants rated vignettes on outcome measures of deception, physician-patient relationship, and patient mood. Participants then characterized a range of placebo acceptability through ratings of deceptiveness, effectiveness, and negative consequences.

Results showed that placebos described as "medication shown to be a powerful analgesic in some people" were equally deceptive as those described as "standard drug

treatment." Placebo deceptiveness was primarily determined by the nature of its administration. However, ratings of patient mood and physician approval were determined as much by treatment instruction as by treatment outcome. Furthermore, consistent with recent placebo studies, negative mood ratings were largely unaffected by placebo administration if they resulted in analgesia, indicating that an analgesic response mitigated the negative consequences of deceptive administration. Participants suggested they would tolerate moderate effectiveness and considerable negative consequences in an acceptable placebo, though results suggest that lay individuals may not have a sophisticated conceptualization of placebo effectiveness. Studies designed to alter individuals' understanding of placebo effectiveness and mechanisms are needed to identify additional factors determining placebo acceptability.

# CHAPTER 1
# INTRODUCTION

Placebo effects have the potential to augment the efficacy of all active medical treatments and procedures.[22] Despite significant advances in understanding the effect, considerable debate persists concerning placebo acceptability and ethics.[11, 24, 27] Opponents of placebo comparisons have cited a number of moral and ethical arguments against their use including violation of personal autonomy and the integrity of the physician- patient relationship, psychological harm, and deception.[4, 22, 26, 31] Conversely, placebo proponents state that under certain circumstances placebo comparisons are the only means to examine behaviors and evaluate treatment efficacy, and that a degree of deception is necessary to invoke the effect. [2, 8, 12, 19] There appears to be a discrepancy between research and clinical use of placebo. Reports indicate that physicians use placebo treatments, [9, 10, 15, 25, 30] with one study reporting that over half of surveyed physicians administered placebo interventions on a regular basis.[32] This issue is further complicated by the dearth of evidence concerning the layperson's attitudes towards placebo use, although one focus group study found that placebo use was associated with negative attitudes towards medical research.[1]

The use and consequences of deception are focal points of the placebo ethics debate.[13, 23] Despite the claims of a number of ethicists, empirical evidence of the negative consequences of deception remains inconsistent.[17] To date, the literature pertaining to placebo acceptability and deception has been based largely on philosophical and theoretical tenants, with relatively few data-driven empirical studies.[2, 5, 13, 18, 21] Chung et al.[7] found that placebo for pain relief caused no negative effects on mood or placebo responses even after the use of placebo was revealed to participants.

Another study by Martin & Katz[20] found no significant differences in mood nor the magnitude of placebo analgesia between two groups differentiated by whether or not they were informed of potential deception while consenting to study participation. A recent investigation regarding patients' attitudes about the clinical use of placebos found that patients were generally open to receiving placebo interventions, though they lacked understanding about how placebos worked.[6]

The current study attempted to expand upon the sparse empirical literature on the acceptability of placebo interventions for pain. In this vignette analog study, systematic manipulation of 1) the instructions used in administering the placebo (hypothesized to represent a range of deceptiveness), 2) the outcome of the treatment, and 3) the progressiveness/severity of the patients' pain were used to examine how these factors influence the acceptability and ethics of a placebo treatment for pain. We hypothesized that placebo in scenarios in which patients were completely deceived by treatment instructions, received worse treatment outcomes, and experienced a more serious pain condition would be rated as less acceptable; conversely, placebo in scenarios in which patients were randomly assigned to treatment, had reduced pain outcomes, and experienced a less serious pain condition would be rated as more acceptable. Finally, we hypothesized that marginally deceptive instructions would represent a "middle ground" of placebo acceptability.

# CHAPTER 2
# METHODS AND MATERIALS

## Participants

Participants were comprised of 103 adults (76 females and 27 males; *M* age = 22.61, *SD* = 4.52) with the only inclusion criteria being that participants were 18 years old or older. The majority of participants were students as 59 participants (57.3 percent) had “some college education” and 15 participants (14.6 percent) had “some graduate school education.” Almost a third of the sample (*N*=29) was “Part-time” employed. The racial breakdown of the sample was as follows: White (*N*=64); Black (*N*=9); Hispanic (*N*=9); Asian or Pacific Islander (*N*=13); Indian (N=4) and Other (*N*=4). The study was advertized through flyers posted throughout the University of Florida campus. Upon study completion participants provided a name and postal address to receive a $15 gift card in the mail.

## Procedure

This study was reviewed and approved by the University of Florida Institutional Review Board and informed consent was obtained from each subject. The questionnaire took approximately 45-60 minutes to complete and responses were anonymous. The study was completed entirely online. Participants were provided the online URL for the study in addition to a unique username and password. The study was comprised of two separate sections: the 1) Placebo Vignettes and the 2) Acceptability Survey.

### Part 1: Placebo Vignettes

The Placebo Vignettes consisted of 18 vignettes, each describing the outcome of a physician-administered placebo intervention for patients experiencing pain. The base

vignette can be found in Figure 2-1. The order in which the vignettes were presented was randomized for each participant. Three factors varied per vignette: the progressiveness of the patients' pain status, the instructions describing the placebo treatment to the patients, and the outcome/effectiveness of the placebo treatment.

There were two levels of pain progressiveness. The patients in each vignette were being treated for either non-progressive pain/pain that is stable (NP) or progressive/worsens/debilitating pain (PP). The descriptors "pain that is stable" and "worsens/debilitating pain" were used to add clarify non-progressive and progressive pain, respectively. Although participants may have been responding to any of the descriptors in responding to a vignette, for purposes of simplicity only the terms non-progressive pain and progressive pain will be used in this manuscript.

There were three levels of treatment instructions. For the "enhanced placebo" (EP) instruction, the patients were told they would receive "a medication that has shown to be a powerful analgesic in some people." This suggestion is similar to that utilized in previous placebo analgesia studies and has been proposed to be an ethically permissible placebo suggestion.[27, 33, 34] For the full deception (FD) instruction, patients were told by their physician that they had "received a standard drug treatment" for their pain. For the random assignment (RA) instruction, patients were informed by their physician that they would receive either a "standard drug treatment or a placebo treatment" for their pain. These instructions were intended to be an experimental manipulation of degree of deception. The purpose of this manipulation was to study/investigate the individual differences in the consequences of learning that one has been deceived.

There were three levels for outcome/effectiveness of the placebo treatment. Upon completion of the intervention, the patients' pain either improved/got better (B), was unaffected by the treatment (NC), or worsened (W).

**Part 2: Acceptability Survey**

The Acceptability Survey, the final section of the study, was completely distinct from the Placebo Vignettes in structure and response format. Participants were asked to rate three levels of acceptability regarding placebo use: an entirely unacceptable placebo (EU), a marginally acceptable placebo (MA), and an entirely acceptable placebo (EA). Each level of acceptability was rated using a combination of three separate Visual Analogue Scales (VAS) (0-100) measuring the relative contribution of each of the following variables: deceptiveness of the placebo ("not at all deceptive" to "completely deceptive"), effectiveness of the placebo ("not at all effective" to "completely effective"), and severity/negative consequences of placebo ("not at all severe" to "most severe imaginable") (Table 2-1).

Following the VAS ratings, participants were asked to respond either "agree" or "disagree" to the following two statements: 1) "I think that placebo for pain is never acceptable" and 2) "I think that placebo for pain is always acceptable."

## Measures

**Visual analogue scales (vas)**. VAS measurements were used in the Placebo Vignettes and in the Acceptability Survey. After reading a vignette, VAS ratings were used to assess participants' attitudes towards the acceptability of each vignette. The following eight questions served as outcome measures : (1) the extent that there was deception (Extent Deception); (2) rating of trust in the physician (Dr. Trust); (3) rating of confidence in the physician (Dr. Confidence); (4) rating of willingness to see the

physician (Dr. Willingness); (5) rating of moral character of the physician (Dr. Moral Character); (6) rating of how angry the patient would be if they knew they had received a placebo (Pt. Anger); (7) how anxious the patient would be if they knew they had received a placebo (Pt. Anxiety); (8) how depressed the patient would be if they knew they had received a placebo (Pt. Depression). Previous research in our lab has shown that pain related negative emotions, such as anger, depression, and anxiety, typically load highly on to a latent negative mood factor; thus it was hypothesized that these three outcomes measure would load highly on to a latent negative mood factor.[14, 28] Furthermore we had no separate a priori hypotheses about individual mood measures. It should be noted that in the Placebo Vignettes, deception is used a both an independent variable (i.e. by proxy through treatment instruction levels) and a dependent measure (i.e. Extent Deception VAS ratings).

For Acceptability Survey VAS descriptions refer to the previous section and Table 2-1.

## Statistical Analyses

### Principle Axis Factoring

The “extent deception” question was of interest as an individual question and intended to be analyzed separately a priori. However because of the potential multi-collinearity of the Placebo Vignettes items, a Principle Axis Factoring (PAF) with oblique rotation was conducted for seven of the eight vignette VAS outcome variables to reduce the number of subsequent analyses and to determine if the three mood related measures loaded on to a single latent negative mood factor. An initial PAF was run that included all eight outcome measures and showed that the Extent Deception measure had low loadings on all factors (highest loading of .451); Thus, the Extent Deception

measure was excluded from this analysis because of its marginal factor loadings and because we had a priori interest in examining its unique relationship with placebo factors. The following measures were included in the analysis: Dr. Trust, Dr. Moral Character, Dr. Willingness, Dr. Confidence, Pt. Anxiety, Pt. Anger, and Pt. Depression. The analysis yielded two latent factors, both with eigenvalues in excess of 1. The first factor yielded an eigenvalue of 4.30 accounting for 59.95% of the variance among the measures; the second factor had an eigenvalue of 2.01 accounting for 26.11% of the variance among the measures. The total variance accounted for by the two factors was 86.06%. The measures Dr. Trust, Dr. Morals, Dr. Willingness, and Dr. Confidence loaded positively on the first factor with factor loadings of .944, .943, .926, and .847, respectively. The measures Pt. Anger, Pt. Anxiety, and Pt. Depression loaded positively on the second factor, with factor loadings of .568, .787, and .728, respectively. These three outcome variables each had negative loadings on the first factor, suggesting a negative correlation between the two latent factors. The corresponding factor regression scores were used to create a "Physician Approval" factor from the first latent factor and a "Negative Mood" factor from the second latent factor. These two factors, in addition to the Extent Deception measure, were used in subsequent Placebo Vignettes analyses. The extraction of the Negative Mood factor supports previous research findings in our laboratory showing mood variables correlate highly, signifying a latent negative mood construct.[14, 28]

**Factorial Repeated-Measures Analyses of Variance (ANOVA)**

Three separate 3 x 3 x 2 (instructions x outcome x progressiveness) repeated-measures Analyses of Variances (ANOVAs) were conducted for Extent Deception, Physician Approval, and Negative Mood. The factor variables were treatment

instructions (EP, FD, and RA), treatment outcome (B, NC, and W), and pain progressiveness (NP and PP). Significant omnibus F tests were followed by simple contrasts.

Table 2-1. Placebo Vignettes and Acceptability Survey outcomes

| Questionnaire measures | Abbreviations | VAS Anchors |
|---|---|---|
| Placebo Vignettes | | |
| To what extent was there deception? | Extent Deception | Not at all deceived---Completely deceived |
| Please rate your trust in the doctor. | Dr. Trust | No trust at all---Complete trust |
| Please rate your confidence in the doctor. | Dr. Confidence | No confidence at all---Complete confidence |
| Please rate your willingness to see the doctor. | Dr. Willingness | Not willing to see this doctor ever again---Completely willing to see this doctor again |
| How would you rate the moral character of the doctor? | Dr. Moral Character | Worst possible moral character---Best possible moral character |
| How angry would this patient be if they knew they received a placebo? | Pt. Anger | Not at all angry---Completely angry |
| How anxious would this patient be if they knew they received a placebo? | Pt. Anxiety | Not at all anxious---Completely anxious |
| How depressed would this patient be if they knew they received a placebo? | Pt. Depression | Not at all depressed---Completely depressed |
| Acceptability Survey | | |
| Deception regarding placebo | Deception | Not at all deceptive---Completely deceptive |
| Effectiveness of placebo | Effectiveness | Not at all effective---Completely effective |
| Severity/negative consequence of placebo | Severity | Not at all severe---Most severe imaginable |

**"A person with a _____(pain progressiveness) condition goes to the doctor. The doctor (treatment instructions)_____. Two weeks after the treatment, the patient reports that ___(treatment outcome)_____. The patient received a placebo. "**

**pain progressiveness status**

1. **"progressive pain (pain that worsens)" … ["debilitating"]**
2. **"non-progressive pain (pain that is stable)"**

**treatment instructions**

1. **" tells the patient het he/she is going to randomly receive either a standard drug treatment or a placebo treatment for his/her [pain descriptor] pain"**
2. **"provides the patient with a prescription for his/her [pain descriptor] pain and tells the patient he/she have been given a medication that has shown to be a powerful analgesic in some people"**
3. **"provides the patient with a prescription for his/her [pain descriptor] pain and tells the patient that he/she have been given a standard drug treatment"**

**treatment outcome**

1. **"his/her condition has gotten worse"**
2. **"there is no change in her/her condition"**
3. **"his/her condition has improved"**

Figure 2-1. Placebo Vignettes base.

Note: Underlined text will change depending on The scenario. The options for pain progressiveness status, treatment instructions, and treatment outcome are displayed below the vignette box.

# CHAPTER 3
# RESULTS

Overall means and standard deviations for Placebo Vignette outcome measures can be found in Table 3-1.

## Extent Deception

### Extent Deception Main Effects

The following results were based upon this individual Placebo Vignettes outcome measure. There were significant main effects of treatment instructions, ($F$(1.47, 149.72) = 222.76, $p$ <.001, $\eta p^2$ = .69), treatment outcome ($F$(2,204) = 10.20, $p$ < .001, $\eta p^2$ = .09), and pain progressiveness, ($F$(1, 102) = 4.13, $p$ =.045, $\eta p^2$ = .04) on the Extent Deception measure (Table 3-2). Participants rated vignettes as more deceptive when patients received enhanced placebo and full deception instructions (compared to random assignment), when they experienced pain worsening outcomes (compared to pain Improvement and no change in pain), and when they had progressive pain. No significant differences were found for deception ratings between full deception and enhanced placebo instructions, or between pain improvement and pain unaffected by treatment outcomes.

### Extent Deception Interactions

A progressiveness x instructions interaction ($F$(2,204) = 4.27, $p$ = .015, $\eta p^2$ = .04) illustrated that differences in deceptiveness ratings between progressive and non-progressive pain conditions were smaller for patients with random assignment compared to other treatment instructions. An instructions x outcome interaction ($F$(3.712, 378.67) = 2.89, $p$ = .026, $\eta p^2$ = .03) showed that scenarios in which patients' pain was unaffected by treatment were rated as more deceptive than pain improvement

scenarios for full deception instructions, but rated as less deceptive than pain improvement when patients were randomly assigned to placebo treatment ($F(1,102) = 4.83$, $p = .030$, $\eta p^2 = .05$). Furthermore, the differences in Extent Deception between pain improvement and pain worsening outcomes were greater for full deception ($F(1,102) = 10.30$, $p = .002$, $\eta p^2 = .09$) and enhanced placebo ($F(1,102) = 6.55$, $p = .012$, $\eta p^2 = .06$) when compared to random assignment (Table 3-2).

## Physician Approval Factor

### Physician Approval Main Effects

The Physician Approval factor was a variable created from the respective loadings of the following four Placebo Survey outcome measures: Dr. Trust, Dr. Confidence, Dr. Willingness, and Dr. Moral Character. Significant main effects of treatment instructions ($F(1.12, 114.35) = 103.39$, $p < .001$, $\eta p^2 = .50$), treatment outcome ($F(1.40, 143.80) = 86.90$, $p < .001$, $\eta p^2 = .46$), and pain progressiveness ($F(1, 102) = 9.08$, $p = .003$, $\eta p^2 = .08$) were found for Physician Approval factor ratings (Table 3-2). Similar to Extent Deception results, there were lower approval ratings when patients received full deception and enhanced placebo instructions (compared to random assignment) and when they had progressive pain, with results showing no significant differences between full deception and enhanced placebo instructions ($F(1,102) = .04$, $p = .835$).

### Physician Approval Interactions

There were no significant interactions for the Physician Approval measure (Table 3-2).

## Negative Mood Factor

### Negative Mood Main Effects

The Negative Mood factor was a variable created from the respective loadings of the following three Placebo Survey outcome measures: Pt. Anger, Pt. Anxiety, and Pt. Depression. Main effects of treatment instructions ($F(1.425, 145.40) = 77.43$, $p < .001$, $\eta p^2 = .43$), treatment outcome ($F(1.37, 139.20) = 86.90$, $p < .001$, $\eta p^2 = .60$), and pain progressiveness ($F(1, 102) = 5.467$, $p = .021$, $\eta p^2 = .05$) were found for the Negative Mood factor (Table 3-2). Significant graded increases in Negative Mood ratings were seen from random assignment, to enhanced placebo, to full deception instructions. Similarly, results showed graded increases in Negative Mood ratings from pain improvement, to pain unchanged, to pain worsening outcomes. Patients were rated as having more negative mood when experiencing progressive pain.

### Negative Mood Interactions

A progressiveness x instructions interaction revealed that differences in Negative Mood ratings for progressive and non-progressive pain only existed for full deception and random assignment conditions, ($F(1,102) = 5.69$, $p = .019$, $\eta p^2 = .05$). There were a number of significant contrasts (Table 3-2) for the instructions x outcome interaction ($F(4, 408) = 8.93$, $p < .001$, $\eta p^2 = .08$); of particular relevance was that differences in Negative Mood ratings between pain improvement and pain worsening, as well as between pain unaffected by treatment and pain worsening, were greater for enhanced placebo instructions than random assignment. Additionally, differences between Negative Mood ratings between pain unaffected by treatment and pain worsening were greater for enhanced placebo than full deception $F(1,102) = 15.21$, $p < .001$, $\eta p^2 = .13$. There was also a progressiveness x instructions x outcome Interaction, with the largest

contrast effect size indicating that ratings for patients randomly assigned, whose pain was unaffected by placebo treatment, had higher Negative Mood ratings if they experienced progressive pain, $F(1,102) = 25.36$, $p < .001$, $\eta p^2 = .20$.

**Acceptability Survey**

Results (Table 3-3 and Figure 3-1) indicated that an entirely acceptable placebo was characterized by low ratings of deceptiveness, high rating of effectiveness, and low ratings of negative consequences; an entirely unacceptable placebo had high ratings of deceptiveness, low ratings of effectiveness, and high ratings of negative consequences; a marginally acceptable placebo was characterized by moderate ratings of deceptiveness, effectiveness, and negative consequences.

Responses to two acceptability statements indicated that 78.1% of participants disagreed with the statement "Placebo for pain is never acceptable" and 9% agreed with the statement "Placebo for pain was always acceptable."

Table 3-1. Placebo Vignette outcome means (VAS = 0-100)

| Measure X Factor | *M* | *SD* |
|---|---|---|
| | Extent Deception | |
| Placebo Instructions | | |
| EP | 71.34 | 2.61 |
| FD | 70.62 | 2.83 |
| RA | 16.38 | 2.56 |
| Outcome | | |
| B | 50.23 | 2.21 |
| NC | 52.15 | 2.02 |
| W | 55.97 | 1.96 |
| Progressiveness | | |
| NP | 51.85 | 2.08 |
| PP | 53.71 | 1.87 |
| | Physician Approval | |
| Placebo Instructions | | |
| EP | 27.08 | 1.98 |
| FD | 27.23 | 1.84 |
| RA | 53.23 | 2.20 |
| Outcome | | |
| B | 44.11 | 1.88 |
| NC | 34.08 | 1.68 |
| W | 29.35 | 1.65 |
| Progressiveness | | |
| NP | 38.86 | 1.67 |
| PP | 34.83 | 1.62 |
| | Negative Mood | |
| Placebo Instructions | | |
| EP | 35.07 | 1.34 |
| FD | 36.33 | 1.47 |
| RA | 24.88 | 1.48 |
| Outcome | | |
| B | 22.38 | 1.40 |
| NC | 32.86 | 1.39 |
| W | 41.04 | 1.54 |
| Progressiveness | | |
| NP | 31.26 | 1.38 |
| PP | 32.93 | 1.33 |

Note: *M,* mean; *SD*, standard deviation; NP*,* Non-progressive Pain; PP*,* Progressive Pain; EP*,* Enhanced Placebo; FD, Full Deception; RA, Random Assignment; B, Pain Improvement; NC, Pain unaffected by treatment; W, Pain Worsening.

Table 3-2. Placebo Vignettes main effect, interactions and contrasts (VAS = 0-100)

| Measure x Factor | *F* | *P* | *ES* ($\eta p^2$) |
|---|---|---|---|
| | Extent Deception | | |
| Placebo Instructions | *F*(1.47, 149.72) = 222.76 | *p* < .001** | 0.69 |
| EP > RA | *F*(1,102) = 269.63 | *p* < .001** | 0.73 |
| FD > RA | *F*(1,102)= 253.58 | *p* < .001** | 0.71 |
| Outcome | *F*(2,204) = 10.20 | *p* < .001** | 0.09 |
| B < W | *F*(1,102) = 16.22 | *p* < .001** | 0.14 |
| NC < W | *F*(1,102)= 9.16 | *p* = .003* | |
| Progressiveness | *F*(1, 102) = 4.13 | *p* = .045* | 0.04 |
| PP > NP | *F*(1, 102) = 4.13 | *p* = .045* | 0.04 |
| Progressiveness x Placebo Instructions | *F*(2,204) = 4.27 | *p* = .015* | 0.04 |
| Diff btw PP and NP is > for EP than RA | *F*(1,102) = 5.98 | *p* = .016* | 0.06 |
| Diff btw PP and NP is > for FD than RA | *F*(1,102) = 6.25 | *p* = .013* | 0.06 |
| Placebo Instructions x Outcome | *F*(3.71, 378.67) = 2.89 | *p* = .026* | 0.03 |
| NC > B for FD, NC < B for RA | *F*(1,102) = 4.83 | *p* = .030* | 0.05 |
| B - W > for FD than RA | *F*(1,102) = 10.30 | *p* = .002* | 0.09 |
| B - W > for EP than RA | *F*(1,102) = 6.55 | *p* = .012* | 0.06 |

Table 3-2. Continued

| Measure x Factor | *F* | *P* | *ES* ($\eta p^2$) |
|---|---|---|---|
| | Physician Approval | | |
| Placebo Instructions | *F*(1.12, 114.35) = 103.39 | *p* < .001** | 0.50 |
| EP < RA | *F*(1,102) = 106.68 | *p* < .001** | 0.51 |
| FD < RA | *F*(1,102) = 108.35 | *p* < .001** | 0.52 |
| Outcome | *F*(1.40, 143.80) = 86.90 | *p* < .001** | 0.46 |
| B > W | *F*(1,102) = 102.58 | *p* < .001** | 0.50 |
| NC > W | *F*(1,102) = 31.63 | *p* < .001** | 0.24 |
| B > NC | *F*(1,102) = 92.21 | *p* < .001** | 0.48 |
| Progressiveness | *F*(1, 102) = 9.08 | *p* = .003* | 0.08 |
| NP > PP | *F*(1, 102) = 9.08 | *p* = .003* | 0.08 |
| | Negative Mood | | |
| Placebo Instructions | *F*(1.43, 145.40) = 77.43 | *p* < .001** | 0.43 |
| EP > RA | *F*(1,102) = 96.59 | *p* < .001** | 0.49 |
| FD > RA | *F*(1,102) = 78.36 | *p* < .001** | 0.43 |
| FD > EP | *F*(1,102) = 4.25 | *p* = .042* | 0.04 |
| Outcome | *F*(1.37, 139.20) = 86.90 | *p* < .001** | 0.60 |
| B > W | *F*(1,102) = 185.97 | *p* < .001** | 0.65 |
| NC > W | *F*(1,102) = 134.93 | *p* < .001** | 0.57 |
| B > NC | *F*(1,102) = 97.30 | *p* < .001** | 0.49 |
| Progressiveness | *F*(1, 102) = 5.47 | *p* = .021* | 0.05 |
| PP > NP | *F*(1, 102) = 5.47 | *p* = .021* | 0.05 |
| Progressiveness x Placebo Instructions | *F*(2,204) = 3.37 | *p* = .036* | 0.03 |
| P ≠ NP for RA; PP > NP for EP & FD | *F*(1,102) = 5.69 | *p* = .019* | 0.05 |

Table 3-2. Continued

| Measure x Factor | *F* | *P* | *ES* ($\eta p^2$) |
|---|---|---|---|
| Placebo Instructions x Outcome | *F*(4, 408) = 8.93 | *p* < .001** | 0.08 |
| B - W > EP than RA | *F*(1,102) = 16.82 | *p* < .001** | 0.14 |
| NC - W > EP than RA | *F*(1,102) = 13.24 | *p* < .001** | 0.12 |
| B - W > FD than RA | *F*(1,102) = 15.43 | *p* < .001** | 0.13 |
| B - NC > FD than RA | *F*(1,102) = 14.20 | *p* < .001** | 0.14 |
| B - NC > FD than EP | *F*(1,102) =9.57 | *p* = .003* | 0.09 |
| NC - W > EP than FD | *F*(1,102) = 15.21 | *p* < .001** | 0.13 |
| Progressiveness x Placebo Instructions x Outcome | *F*(4,408) = 6.77 | *p* < .001** | 0.06 |
| For EP & B, PP > NP | *F*(1,102) = 5.15 | *p* < .025* | 0.05 |
| For EP & W, PP < NP | *F*(1,102) = 7.66 | *p* < .007* | 0.07 |
| For FD & NC, PP > NP | *F*(1,102) = 14.34 | *p* < .001** | 0.12 |
| For FD & W, PP > NP | *F*(1,102) = 4.89 | *p* < .029* | 0.05 |
| For RA & NC, PP > NP | *F*(1,102) = 25.36 | *p* < .001** | 0.20 |

Note: *F*, *F* Statistic; *P*, *P* value; ES, effect size; $\eta p^2$, partial eta squared; PP, Progressive Pain; NP, Non-progressive Pain; EP, Enhanced Placebo; FD, Full Deception; RA, Random Assignment; B, Pain Improvement; NC, Pain unaffected by treatment; W, Pain Worsening; * Indicates significant difference ($p < 0.05$); **Indicates significant difference ($p < 0.001$).

Table 3-3. Acceptability Survey means (VAS = 0-100)

| Acceptability x Factor | *M* | *SD* |
|---|---|---|
| | EU | |
| Deception | 79.00 | 30.65 |
| Effectiveness | 23.86 | 29.16 |
| Severity | 67.88 | 31.88 |
| | MA | |
| Deception | 47.55 | 32.19 |
| Effectiveness | 44.66 | 27.04 |
| Severity | 35.44 | 28.33 |
| | EA | |
| Deception | 24.24 | 32.73 |
| Effectiveness | 72.01 | 33.05 |
| Severity | 14.80 | 21.43 |

Note: *M*, mean; *SD*, standard deviation; EU, Entirely Unacceptable; MA, Marginally Acceptable; EA, Entirely Acceptable.

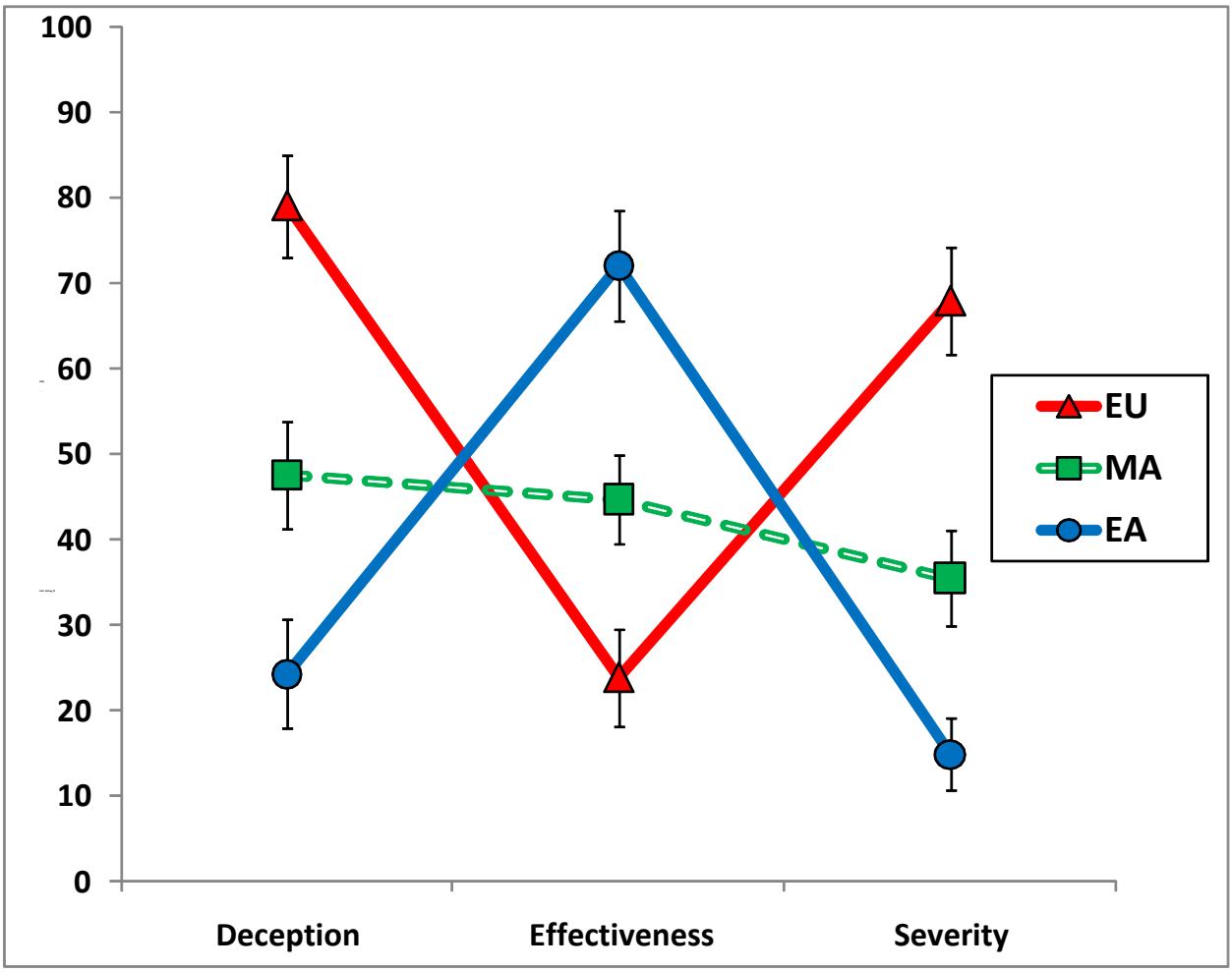


Figure 3-1. Acceptability Survey graph.

Note: Error bars are standard error of the mean; EU, Entirely Unacceptable; MA, Marginally Acceptable; EA, Entirely Acceptable.

# CHAPTER 4
# DISCUSSION

The aim of the present study was to assess attitudes towards the use of a placebo treatment for pain in addition to evaluating the contributions of specific factors in determining placebo acceptability. Our primary aim was to test the effects of level of deception, the effectiveness of the placebo, and the severity (progressiveness) of the pain condition on attributes about provider, mood, and perceived placebo acceptability. Our results supported our hypotheses by demonstrating a number of main effects across the three vignette manipulations –instructions regarding placebo administration, placebo treatment outcome, and progressiveness of the patient's pain. Although not a priori hypothesized, a number of interactions between these factors were observed. Overall, participants rated placebo interventions as significantly more acceptable when patients were randomly assigned to a treatment group, when the treatment resulted in an improvement in pain, and when patients' pain was non-progressive. Conversely, vignettes were rated as significantly less acceptable overall when placebo administration entailed full deception, when the treatment culminated in a worse pain outcome, and when patients had progressive pain.

## Extent Deception

Whereas the effects of progressiveness of pain condition and placebo treatment outcome were statistically significant, ratings regarding extent of deception were largely influenced by whether or not patients were randomly assigned to a placebo treatment, with full deception and enhanced placebo instructions rated as similarly deceptive. Overall, graded increases in deception were observed from pain that improved, to pain remaining unaffected by treatment, to pain that worsened as a result of placebo for both

full deception and enhanced placebo and instructions. An interaction indicated that when patients were told they would be randomly assigned to placebo treatment, pain improvement was rated as more deceptive than when pain was unaffected by placebo treatment, suggesting that participants may have had less trust in the nature of the patients' pain relief when fully aware that the outcome may have resulted from a placebo. Consistent with results from recent placebo studies,[6, 9] this finding may reflect misunderstanding among those in the general public about placebo mechanisms and effectiveness. Although the present interaction and a number of the significant interactions had small effect sizes, they represent directions for future investigations examining the relationships between placebo factors.

**Physician Approval**

Deterioration of the physician – patient relationship, a concern traditionally purported by ethicists as an argument against placebo use[22], is a stance that has received sparse empirical examination. Our findings indicate that physician approval ratings were characterized by large effects of treatment instructions and treatment outcome. Whereas the effect of instructions was largely determined by whether or not patients were randomly assigned to receive the placebo, treatment outcome was primarily influenced by whether patients' pain improved upon treatment (placebo) completion. While these findings support assertions that physician approval is highly dependent on deceptiveness of placebo administrations, they also indicate that beneficial treatment outcomes may influence the physician –patient relationship.

## Negative Mood

Interactions between outcome, treatment instructions, and pain progressiveness influenced negative mood. The increase in negative mood seen when patients had progressive pain (compared to non-progressive pain) was significantly greater when patients received the full deception instructions than when they received enhanced placebo instructions. This finding is important because it demonstrates that, in contrast to being fully deceived in placebo administration, patients mood ratings were virtually unaffected by their pain status for the enhanced placebo condition. Differences in negative mood among the three treatment outcomes were generally greater for enhanced placebo and full deception than for random assignment, again suggesting that a sophisticated understanding of placebo mechanisms has not reached the lay public. Negative mood results support the findings from Chung et al.[7] and Martin and Katz[20], indicating that there were relatively minor effects on mood ratings resulting from the revelation of a placebo analgesia response. There were a number of significant interactions and associated contrasts for this measure, the largest of which showed higher negative mood ratings for randomly assigned progressive pain patients whose pain remained unaffected by the placebo treatment. This is an interesting finding, suggesting that even though the instruction set was perceived as low in deception, a poor treatment response was still potentially harmful (worsened mood).

## Acceptability Survey

Acceptability Survey findings illustrated that an entirely acceptable placebo consisted of low ratings of deceptiveness and severity/negative consequences, with high ratings of placebo effectiveness. Conversely, an entirely unacceptable placebo consisted of high ratings of deceptiveness and severity/negative consequences, with

low ratings of placebo effectiveness. Although these results may appear intuitive, it should be noted that the highest average ratings did not encompass the extremes of the scales. For example, while both deceptiveness and severity/negative consequences ratings were predictably low for an entirely acceptable placebo, the fact that they were not closer to zero suggests that a marginal degree of deception and negative consequences could be tolerated in what people conceptualize as a completely acceptable placebo. More informative were results for what constituted a marginally acceptable placebo – what may be conceptualized as a threshold for placebo acceptability. Ratings were almost equal to the averages of entirely acceptable and entirely unacceptable for deceptiveness, effectiveness, and severity/negative consequences, suggesting potential patients may tolerate a considerable degree of deception and negative consequences in a pain placebo intervention as well as relatively moderate effectiveness. Given evidence that patients are open to the use of analgesic placebo treatments in some circumstances[6], and that nearly 80% of our sample believed there were instances when placebo for pain was acceptable, further studies are needed to determine the lowest tolerable levels of deceptiveness and negative consequences necessary to constitute an acceptable placebo.

## Implications

Findings from this study provide empirical evidence that a degree of deception is perceived in placebo administration. This was true even when an accurate, but arguably deceptive, enhanced placebo description was used. Perception of treatment deception was strongly determined by method of placebo administration – specifically whether or not patients were randomly assigned to receive a placebo or a standard treatment for their pain. Interestingly, this was contrasted for ratings of physician-patient relationship

and negative mood, both of which were almost equally influenced by deceptiveness and treatment outcome. These findings are significant for a number of reasons. First, they indicate that a degree of deception and negative consequences can exist in people's perception of an acceptable placebo for pain. While researchers and clinicians should continue to explore innovative means of delivering placebo without deception, if this goal proves unattainable, the focus should shift to examining the combination of symptom relief, consequence severity, and deceptiveness that still comprise an acceptable treatment. Secondly, our findings empirically support the claims of a number of ethicists that the deceptiveness of a placebo treatment is driven by the nature of its administration.[3, 22] Furthermore, it demonstrates that potential patients perceive enhanced placebo instructions, considered by some researchers as ethically permissible,[27, 34] as deceptive. Thirdly, our results illustrate that the outcome of a placebo intervention may be just as important as the deception of administration in determining ratings of both patient's mood as well as appraisal of the physician-patient relationship.

There were limitations to the generalizability of this study. Although participants were asked to respond to vignettes as if they were the patients, the ratings from a primarily undergraduate sample may not have been representative of a pain patient population.[16] However, it is important to remember that these participants are, and will be consumers of medical services. Furthermore, the sample also is representative of a voting public that will in part determine policies about placebo use. Finally, we acknowledge that this study was designed with a priori hypotheses about Placebo Vignette main effects and not their interactions, thus making the interpretation of the

interactions a somewhat speculative venture. While recognizing our interpretive limitations, we fully believe this design was necessary and warranted given the lack of empirical data on said interactions, and we expect this examination to serve as the rational for future hypothesis driven designs.

## Conclusions

The results of the present study illustrate that for the perception of placebo treatments for pain, physician-patient relationships and negative mood are dependent as much by the deceptiveness of a placebo administration as by the outcome of the intervention. This is significant as the importance of treatment outcome and associated placebo efficacy is largely overshadowed in the placebo ethics literature by issues of deceptiveness. Although the manner in which placebos are administered strongly determines the degree of treatment deceptiveness, our results confirm the findings of previous studies that a considerable degree of deception and negative consequences can be tolerated in people's conceptualization of an acceptable placebo. While the largest effects were predicted and seen for deception and treatment outcome, our results show that significant interactions between these factors and pain severity do differentially affect placebo acceptability, suggesting further investigations into these relationships is not only warranted but necessary. Studies designed to instruct participants on the mechanisms of placebo might yield greater placebo acceptability from instruction sets that highlight that placebo effects are well characterized, physiologically active effects.

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# BIOGRAPHICAL SKETCH

Nkaku Kisaalita was born in Vancouver, British Columbia. He is the son of William and Rose Kisaalita. Nkaku has an older brother, Ntumwa, a younger brother, Ssempa, and a younger sister, Namirembe. Nkaku graduated with honors from the University of North Carolina at Chapel Hill in May 2007 with a Bachelor of Science in Psychology.

As part of his college honors thesis, Nkaku conducted research examining tactile and auditory sensory system interactions. After graduating, he coordinated a 2-year study through the UNC Psychology Department examining cognitive and perceptual factors that influence pain perception in individuals with sickle cell disease.

Nkaku joined the Clinical and Heath Psychology doctoral program at the University of Florida in 2009 working in Dr. Michael Robinson's lab. His research interests include chronic diseases, pain, placebo analgesia, placebo ethics, pain related wind-up, and the influence of cognition on pain perception. Nkaku is currently living in Gainesville, Florida.