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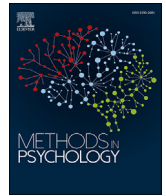
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# Perceptions and understanding of research situations as a function of consent form characteristics and experimenter instructions



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## ABSTRACT

Two studies examined how research methodology affected participant behaviors. Study 1 tested (a) consent form perspective (1<sup>st</sup>, 2<sup>nd</sup>, or 3<sup>rd</sup> person) and (b) information on participants' right to sue upon perceptions of coercion, ability to recall consent information, and performance on experimental tasks. Unexpectedly, participants who received instructions *without* the right to sue information had significantly better recall of their research rights. Study 2 manipulated (a) consent form complexity (presence or absence of jargon) and (b) the detail of verbal instructions (simple, elaborate); participants who received a consent form with simpler language spent more time on a difficult task, and participants in the elaborate instruction condition recalled more details. Together, these studies suggest (a) explaining the right to sue may actually be counterproductive; (b) providing a more detailed explanation may help participants remember procedural details; and (c) using jargon may decrease task performance.

## 1. Background

Research participation is a core component of undergraduate education, particularly in the social sciences. However, despite the ubiquitous nature of undergraduate research participation, researchers often overlook how various aspects of basic research methodology impact participants' overall perceptions of the research process, their performance on experimental tasks, and – perhaps most importantly – their ability to provide valid informed consent (e.g., Edlund et al., 2014; Mann, 1994; Pedersen et al., 2011). If we wish to remain true to our ethical obligations as researchers, any factors that negatively affect a participant's ability to validly consent to participation in a study should be thoroughly explored and understood.

With limited exceptions, research with human participants requires that we obtain their informed consent. Importantly, informed consent goes above and beyond merely informing participants of the nature of the research prior to their agreement to participate. True informed consent also implies that participants are allowed to contemplate their decision to participate (or not) under circumstances that “minimize the possibility of

coercion or undue influence” (§46.116; Code of Federal Regulations).<sup>1</sup> In other words, researchers' procedures for obtaining informed consent must clearly communicate to participants that they are under no obligation whatsoever to participate, that they are free to decline participation outright or withdraw participation at any point during the study's procedure, and that there can be no penalty for declining or withdrawing participation. Typically, researchers attempt to address this issue by including statements regarding the freedom to decline participation in an informed consent form (Pedersen et al., 2011).

Unfortunately, empirical evidence suggests participants often do not read consent forms thoroughly prior to participation. For example, in a series of studies examining patients in a health care setting, over half of the participants spent 30 s or less reading a consent form that should have taken the average person several minutes to read (McNutt et al., 2008). Other studies suggest participants have considerable difficulty understanding and/or remembering the content of an informed consent document. These patterns have been documented among varying populations, including medical patients (Palmer et al., 2008) and undergraduate students (Pedersen et al., 2011; Wogalter et al., 1999). Mann

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<sup>1</sup> Because the authors reside in the United States, we reference the federal guidelines of that country. However, we believe the issues of informed consent addressed in this article are applicable regardless of a researcher's country of origin.

(1994) found that a shortened version of a consent form led to better comprehension among undergraduate participants than a longer version, but even short-form participants struggled to recall certain aspects of the form correctly (e.g., “What can you do if you have a complaint about the study?”, p. 142). Mann (1994) also examined participants’ understanding of their legal rights as communicated by the consent form. Compared to participants who merely read the consent statement on an information sheet with no signature line, participants who physically signed a consent form were more likely to believe they had abdicated their legal right to sue the researcher – a legal right that is in fact protected by the form. Thus, it is tenuous at best to assume that simply handing participants a consent form will suffice in terms of fully informing them.

In addition to concerns related to comprehension and recall of information in a consent form, federal guidelines express concern over the language perspective used in the consent statement. Specifically, the Office for Human Research Protections (Office for Human Research Protections, 1993) suggested researchers should avoid first person language (e.g., “I agree to participate ...”) in consent statements, as such language may be overly coercive. However, this recommendation was not based on empirical evidence. This lack of evidence is troubling, especially considering at least one recent study has suggested first person prose has no negative impact on participants (Edlund et al., 2014). Indeed, some studies suggest first person language may actually be beneficial in terms of reading comprehension (e.g., Wogalter et al., 1999).

Another factor that may influence participant behavior is the presence and behavior of an experimenter obtaining the informed consent. Though experimenter characteristics have been studied in the context of general experimental procedures (e.g., in studies of aggression – Cohen et al., 1996; social tuning – Sinclair et al., 2005; and stereotype threat – Stout et al., 2011), rarely have they been studied with respect to the informed consent process. There have been occasional exceptions, however. Edlund et al. (2014) conducted two studies examining not only the influence of language perspective of the consent form on undergraduate participants’ perceptions of the research situation and performance on experimental tasks, but also how the experimenter’s manner of greeting participants, the experimenter’s manner of dress, and the number of other participants in the laboratory affected these same outcomes. Neither study yielded evidence supporting the OHRP recommendation to avoid first person language in consent statements, as there were no significant differences in participants’ perceptions of coercion between first person, second person, and third person wording. The findings also suggested experimenter characteristics affected participants in two ways: (1) formal laboratory attire (i.e., slacks and a lab coat): led to greater perceptions of coercion; and (2) a warm greeting upon arriving at the laboratory led to greater persistence on a difficult experimental task. Finally, the presence of other participants in the laboratory was positively related to participant effort, such that the more participants present, the longer participants spent working on experimental tasks.

The current research represents an attempt to further understand how small features of an experimental situation can influence participant perceptions of freedom (vs. coercion), understanding of the right to sue, and persistence on experimental tasks in quantitative psychological research that utilizes a consent form as the primary method of obtaining informed consent. Study 1 sought to replicate previous findings examining the effect of wording choice (1st, 2nd, or 3rd person prose) upon participants’ perceptions of their right to sue a researcher as well as the effect of additional research participants upon participant behavior. Study 2 manipulated language complexity to examine its effects on participant engagement as well as perceptions of coercion.

## 2. Study 1

Mann (1994) found that participants believed signing a consent form constituted a waiver of the legal right to sue the researcher(s). Edlund et al. (2014) found no support for the OHRP contention that first person language in an informed consent form may be coercive, but did find

evidence that other aspects of the experimental situation – e.g., experimenter clothing – can impact perceptions of coercion. Edlund et al. also found that experimenter demeanor and the presence of other participants can affect effort and/or performance on experimental tasks. Study 1 was designed to extend the work of Mann (1994) and Edlund et al. (2014) by further exploring consent form language perspective and participants’ understanding of their legal rights. In addition to manipulating the language perspective of the consent form, this study examined whether verbally providing information regarding participants’ right to sue the researchers would impact participants’ perceptions of coercion and their comprehension of their rights as research participants. We predicted that (a) consent form perspective would not affect perceptions of coercion (Edlund et al., 2014); (b) information on the right to sue would yield better understanding of one’s rights as a research participant (Mann, 1994); and (c) the presence of other participants would be positively related to persistence on experimental tasks (Edlund et al., 2014).

### 2.1. Method

#### 2.1.1. Participants

The sample for Study 1 consisted of 210 undergraduates (170 women, 40 men,  $M_{age} = 19.22$  years,  $SD_{age} = 2.78$ ) enrolled in introductory psychology courses at Stephen F. Austin State University (SFA), a mid-sized public university in east Texas.<sup>2</sup> There were 109 Caucasians, 76 African Americans, 17 Hispanics, two Asian Americans, and six participants of other ethnicities. All participants received credit toward a course requirement in return for their participation. The study’s procedure was approved by the Institutional Review Board (IRB) at SFA as expedited.

#### 2.1.2. Materials

**2.1.2.1. Informed consent forms.** Three versions of a standard informed consent form were created for this study, differing only in the language perspective used in the construction of the form. Specifically, the consent statements were written entirely in either first person (e.g., “I agree to participate ...”), second person (e.g., “You agree to participate ...”), or third person (e.g., “The participant agrees to participate ...”); emphasis added in all cases). Otherwise, the basic content of each version was identical, including a general description of the study’s procedures, contact information for the principal investigator, a statement regarding the voluntary nature of participation and the right to withdraw at any time, information regarding SFA’s IRB, a description of the perceived risks and benefits involved in the study, a statement that the participant was not waiving any legal rights by signing the consent form, and a space for a signature and date.

**2.1.2.2. Triangle task.** Participants were given a picture of an obtuse triangle and instructed to divide it into a group of smaller acute triangles. The instructions emphasized that participants were not simply to draw as many acute triangles as possible, but rather to only draw those that were needed. (The terms *obtuse triangle*, *acute triangle*, and *right triangle* were defined.) Even though this task has a concrete solution, it is essentially a near-impossible challenge for most participants (in our labs’ pretesting, the successful completion rate is less than .01%). Participants were allowed a maximum of 10 min to work on the task, with the caveat that they were under no obligation to use the full 10 min. Because of its slim

<sup>2</sup> We acknowledge the possibility that participating in research for course credit may in and of itself be perceived as a coercive process. However, the psychology departments at all three institutions from which data were collected for this report (Stephen F. Austin State University, Gannon University, and Rochester Institute of Technology) provide introductory psychology students with alternative assignments to research participation and clearly explain (both verbally and in writing) that students are not obligated to take part in research studies.

likelihood of being solved correctly, we considered this task a measure of persistence (cf. Orne, 1962).

**2.1.2.3. Word completion task.** Participants were given 10 word fragments with multiple letters missing from each word. The words ranged from 7 to 10 letters in length and had between three and six letters missing. Instructions were to complete as many of the word fragments as possible with legitimate words from the English language. As with the triangle task, participants were allowed up to 10 min to work on the word completion task, but they were also told they could finish prior to the 10-min deadline if they chose to do so. This task was included as an additional measure of experimental persistence as well as a measure of cognitive performance (as evaluated based on the number of words successfully completed correctly).

**2.1.2.4. Participant perceptions of freedom vs. coercion.** Participants' overall perceptions of freedom vs. coercion in the experimental situation were assessed using a series of six questions, all of which utilized a 5-point response scale ranging from *None* or *Not at all* (1) to *Totally* or *Completely* (5). These questions addressed issues such as coercion (e.g., "How much freedom did you feel in choosing to decline to participate in any part of this research?"), comfort (e.g., "How comfortable did you feel with this research?"), and fairness (e.g., "How fair do you perceive the research process as being?" – see Appendix A). No time limit was placed on this measure.

**2.1.2.5. Consent form quiz.** Participants were given a quiz to test recall of the basic content of the informed consent form. No time limit was used for this measure. Participants were asked a total of seven questions, all of which were open-ended (e.g., "What potential risks or discomforts did the consent form suggest you might have?"), to measure the extent to which they had retained information from the consent form (see Appendix B). This task was scored in two ways, referred to as the "conservative" and "liberal" scoring methods from this point forward. The conservative method scored each response as strictly correct or incorrect based on the information presented in the consent form. The liberal method was more lenient, accounting for the fact that an answer might be plausible if not strictly correct based on the consent form. For example, the strictly correct response to the question "Who should you contact if you have questions about your rights as a research participant?" was the SFA Office of Research and Sponsored Programs. However, some participants provided responses such as "My psychology instructor." Though not correct according to the consent form itself, this answer could be considered reasonable, as the participant's course instructor could easily direct the participant to the correct point of contact.

**2.1.2.6. Demographics.** Participants reported their age, gender, ethnicity, classification (i.e., freshman, sophomore, junior, or senior), the number of psychology courses they had taken (including current enrollments), and the number of psychological research studies they had participated in (including the current study).

### 2.1.3. Design and Procedure

Two variables were manipulated in Study 1. First, consent form perspective was manipulated by randomly assigning participants to one of the three aforementioned versions of the consent form. Second, information on the right to sue the researcher was also manipulated by randomly assigning participants to either receive or not receive a verbal explanation of this right from the experimenter (see Appendix C). Consent form perspective was manipulated at the level of the individual participant; however, information on the right to sue was manipulated at the level of the experimental session. This approach was taken so the experimenter only had to deliver the right to sue information once to all participants in a given session. Finally, though not manipulated, the number of other participants in the laboratory (from 0 to 5) during any

given experimental session was tracked so this variable could be used as a quasi-experimental variable in the analyses. Similar to Edlund et al. (2014), we felt tracking this variable could be important due to research suggesting the presence of others can impact participant performance on a variety of tasks (see Zajonc, 1965).

Upon arriving at the laboratory for a study purportedly investigating basic cognitive abilities, participants were greeted by an experimenter (either a graduate or undergraduate research assistant, depending on the session) and provided with the first person, second person, or third person consent form. For participants in sessions that were randomly assigned to receive the verbal right to sue information in addition to the consent form, this information was delivered at the same time as the consent form.

After signing and returning the consent form (no participants refused to do so), each participant was seated at a desk and given a packet containing the various experimental tasks, each on a separate page. First, participants responded to the demographic inquiries. Next, participants had 10 min to complete the triangle task, but were told they were not obligated to use the entire 10 min. Once the triangle task was completed, participants encountered the word completion task and were given 10 min to complete it, again with the caveat that there was no obligation to use all 10 min. Once this task was completed, participants moved on to the questionnaire on perceptions of the experimental process. Finally, the research rights quiz was administered and completed. Total participation time was approximately 30 min.

### 2.1.4. Data Analysis Strategy (treat as section heading)

Our hypotheses were that (a) consent form perspective would not affect perceptions of coercion (based on the results obtained by Edlund et al., 2014); (b) information on the right to sue would yield better understanding of one's rights as a research participant; and (c) the presence of other participants would be positively related to persistence on experimental tasks. The first hypothesis was tested with a factorial ANOVA using an aggregate score on the perceptions of freedom vs. coercion measure as the dependent variable. The second hypothesis was tested with factorial ANOVAs using overall scores on the consent form quiz – one derived from the conservative scoring method and one derived from the liberal scoring method – as the dependent variables. The third hypothesis was tested with factorial ANOVAs using overall time spent on the triangle task and word completion task as the dependent variables.

## 2.2. Results

### 2.2.1. Perceptions of freedom vs. coercion

A 3 (Consent Form Perspective: first person, second person, third person) x 2 (Right to Sue Information: yes, no) x 2 (Participant Gender: male, female) x 6 (Other Participants Present: 0, 1, 2, 3, 4, 5) between-subjects ANOVA on the perceived freedom questionnaire resulted in a significant Right to Sue Information x Participant Gender interaction,  $F(1, 151) = 6.40, p = .012, \eta_p^2 = 0.041$ . Among participants who did not receive instructions on the right to sue, men had significantly lower perceptions of freedom than women,  $t(92) = -3.19, p = .002$ . However, among participants who received instructions on the right to sue, there was no significant difference between men and women (see Table 1 for means and SDs for each group). Importantly, consent form perspective did not have a significant main effect,  $F(2, 151) = 0.54, p > .5$ , nor was it involved in any significant interactions (all  $p$ 's  $> 0.3$ ), supporting our hypothesis that language perspective on the consent form would not impact the extent to which participants felt coerced within the research situation.

### 2.2.2. Knowledge of content of consent form

A 3 (Consent Form Perspective: first person, second person, third person) x 2 (Right to Sue Information: yes, no) x 2 (Participant Gender: male, female) x 6 (Other Participants Present: 0, 1, 2, 3, 4, 5) between-subjects ANOVA on the conservatively-scored consent form quiz



**Table 1**  
Mean Perceptions of Freedom vs. Coercion as a Function of Right to Sue Information and Participant Gender, Study 1.

Right to Sue Information	Participant Gender	
	Male	Female
Yes	24.95 (3.87)	25.19 (3.90)
No	23.10 (3.88)	25.90 (3.46)

Note. Right to Sue Information x Participant Gender interaction,  $F(1, 151) = 6.40, p = .012, \eta_p^2 = 0.041$ . Higher values reflect greater perceptions of freedom within the experimental situation; standard deviations are presented in parentheses.

indicated a significant main effect of Right to Sue Information,  $F(1, 151) = 4.74, p = .031, \eta_p^2 = 0.03$ . Participants who received instructions with the right to sue information ( $M = 2.28, SD = 1.03$ ) performed significantly worse on the quiz than those who did not receive instructions on the right to sue ( $M = 2.84, SD = 0.89$ ). This result was contrary to our hypothesis, which posited that participants who received the right to sue information would have better knowledge of their rights as a research participant.

A 3 (Consent Form Perspective: first person, second person, third person) x 2 (Right to Sue Information: yes, no) x 2 (Participant Gender: male, female) x 6 (Other Participants Present: 0, 1, 2, 3, 4, 5) between-subjects ANOVA on the liberally-scored consent form quiz did not yield any significant effects.

### 2.2.3. Persistence and performance on experimental tasks

**2.2.3.1. Time spent on triangle task.** A 3 (Consent Form Perspective: first person, second person, third person) x 2 (Right to Sue Information: yes, no) x 2 (Participant Gender: male, female) x 6 (Other Participants Present: 0, 1, 2, 3, 4, 5) between-subjects ANOVA on time spent on the triangle task yielded no significant effects.<sup>3</sup>

**2.2.3.2. Time spent on word completion task.** A 3 (Consent Form Perspective: first person, second person, third person) x 2 (Right to Sue Information: yes, no) x 2 (Participant Gender: male, female) x 6 (Other Participants Present: 0, 1, 2, 3, 4, 5) between-subjects ANOVA on time spent on the word completion task resulted in several significant effects.<sup>4</sup> However, all of these effects were subsumed by a significant Consent Form Perspective x Right to Sue Information x Participant Gender x Other Participants Present interaction,  $F(2, 152) = 3.83, p = .024, \eta_p^2 = 0.048$ .

To break down this four-way interaction, the data were separated according to Right to Sue Information condition. Among participants who received the right to sue information, the only significant effect was a main effect of Other Participants Present,  $F(5, 89) = 3.51, p = .006, \eta_p^2 = 0.165$ . Participants who had between two and five other participants present in the laboratory ( $M_s = 7:02, 7:18, 8:14, \text{ and } 7:16$ , respectively)

<sup>3</sup> An astute reader will note that the four-way interactions in this section are significantly underpowered. The omnibus analyses were not focused on this four-way interaction; instead, this approach was utilized to attenuate experiment-wise error rates. Parallel lower-order confirmatory analyses reached the same conclusions when the underpowered higher-order interactions were dropped.

<sup>4</sup> The significant effects in this analysis included a main effect of Consent Form Perspective,  $F(2, 152) = 4.82, p = .009, \eta_p^2 = 0.06$ ; a main effect of Right to Sue Information,  $F(1, 152) = 7.43, p = .007, \eta_p^2 = 0.047$ ; a Consent Form Perspective x Participant Gender interaction,  $F(2, 152) = 3.13, p = .046, \eta_p^2 = 0.04$ ; a Right to Sue Information x Other Participants Present interaction,  $F(5, 152) = 2.96, p = .014, \eta_p^2 = 0.089$ ; and a Consent Form Perspective x Right to Sue Information x Participant Gender interaction,  $F(2, 152) = 4.42, p = .014, \eta_p^2 = 0.055$ . To conserve space, we focused on the four-way interaction in the Study 1 results section.

spent considerably more time on the word completion task than participants with no other participants present or only a single other participant present ( $M_s = 4:49 \text{ and } 4:18$ , respectively). Among participants who did not receive the right to sue information, the only significant effect was a Consent Form Perspective x Participant Gender x Other Participants Present interaction,  $F(5, 63) = 2.53, p = .037, \eta_p^2 = 0.167$ . Follow-up analyses suggested this interaction was driven by a marginal tendency ( $p = .074$ ) for female participants to be affected by the presence of other participants, taking more time on the word completion task when one or more other participants were present. Male participants did not show this tendency.

**2.2.3.3. Performance on word completion task.** A 3 (Consent Form Perspective: first person, second person, third person) x 2 (Right to Sue Information: yes, no) x 2 (Participant Gender: male, female) x 6 (Other Participants Present: 0, 1, 2, 3, 4, 5) between-subjects ANOVA on the number of words correctly completed revealed a significant main effect of Consent Form Perspective,  $F(2, 152) = 3.32, p = .039, \eta_p^2 = 0.042$ . However, this effect was qualified by a Consent Form Perspective x Participant Gender interaction,  $F(2, 152) = 3.03, p = .051, \eta_p^2 = 0.038$ . Female participants ( $M = 4.28, SD = 2.21$ ) outperformed male participants ( $M = 2.70, SD = 1.42$ ) among those who received the first person consent form,  $t(75) = -2.19, p = .032$ , whereas male participants ( $M = 5.38, SD = 2.14$ ) outperformed female participants ( $M = 4.12, SD = 1.68$ ) among those who received the second person consent form,  $t(60) = 2.27, p = .027$ . There was no gender difference among participants who received the third person consent form.

### 2.3. Discussion

Our first hypothesis – that consent form language perspective would not affect participant perceptions of coercion – was supported. Although we understand this support is based on null effects, and interpretation of such effects can be difficult, we feel confident in this outcome for two reasons: (1) the sample size here was substantial enough that detecting even small effects should not have been problematic; and (2) the current data essentially replicate the null pattern obtained by Edlund et al. (2014). However, the interaction between the right to sue information and participant gender on perceptions of coercion was an unexpected effect. These results are somewhat similar to Sloan et al. (2013), who found African American males expressed more pessimistic views about their likelihood of arrest and conviction on driving while intoxicated (DWI) charges relative to other ethnicity/gender combinations. Nonetheless, because Sloan et al. (2013) focused on perceptions of freedom in a legal context rather than a research context, our finding requires further replication before any definitive conclusions can be drawn.

We also expected that providing participants with verbal information about their research rights (particularly the right to sue the researchers) would improve the accuracy of their recall regarding such rights, but this was not the case. In fact, the opposite occurred: Participants who were verbally informed of their right to sue performed worse on the research rights quiz than those who were not verbally informed. We speculate that this decline in recall among verbally-informed participants may be attributable to a decrease in their motivation to pay attention to the informed consent process after learning their rights were protected. That is, upon hearing their rights were protected, some participants may have had little desire to actually read and comprehend the specific content of the consent form. Another possibility is that the additional information received by participants in the right to sue information condition disrupted memory consolidation for the informed consent information. That is, receiving additional verbal information may have interfered with memory processing for the informed consent information as it occurred immediately after

reading the consent form. Finally, it is also worth noting that the mean recall performances of the two groups, when taken out of a maximum possible score of 7, translate to 32.6% and 40.6% respectively. Such mediocre recall is well in line with past studies investigating participants' ability (or lack thereof) to remember information from consent forms (e.g., Pedersen et al., 2011).

Based on the work of Edlund et al. (2014), we also hypothesized that a higher number of participants being present in the laboratory would be associated with greater persistence on the triangle and word completion tasks. This hypothesis only partially supported for the word completion task. Participants who received the right to sue information spent more time on the word completion task when more fellow participants were present. We also found an unexpected interaction between consent form perspective and participant gender on the number of words correctly completed, with female participants completing more words if they received the first person consent form, but male participants completing more words if they received the second person consent form. Because this effect was not predicted, and similar effects were not observed in the studies within our literature review, we are unsure as to why this pattern occurred. At a minimum, this pattern should be replicated before attempting to draw any concrete conclusions.

Though not all of the results from Study 1 were expected, we do feel confident in drawing two basic conclusions: (1) the concern over language perspective (first, second, or third person) in consent forms expressed by the OHRP is unwarranted – the data simply do not indicate participants feel more coerced when reading a consent statement worded in the first person<sup>5</sup>; and (2) researchers need to explore other possible techniques for helping participants understand their legal rights – particularly the fact that signing a consent form is not the equivalent of giving up one's right to sue the researchers.

### 3. Study 2

Numerous studies have investigated how well patients understand consent forms in the context of medical informed consent, and the majority of these studies have found understanding to be wanting. For instance, the National Quality Forum (2005) found that over 60% of patients did not fully understand the procedure they had consented to. A more recent study found participants did not understand the meaning of key terminology commonly used in consent forms (Koh et al., 2012). This finding was further echoed by Edlund et al. (2015), who found low rates of comprehension of key components of the consent process that directly impacted the patients' quality of life. Edlund et al. (2015) speculated that the complexity of the language used in the consent form contributed to low comprehension of the content (which was written at a 13th grade level). This speculation is in line with past studies of participants' ability to recall medical information. For example, Bradshaw et al. (1975) found that more complex language (as determined by the Flesch Reading Ease Formula) led to decreased recall of dietary information.

In an effort to directly address these issues, the current study manipulated the complexity of the language used in the consent form (everyday terminology vs. complex jargon) and the level of detail in the verbal instructions provided by an experimenter (minimally detailed vs. highly detailed) to determine their effects on participant comprehension and task performance. We predicted that (a) more complex language on the consent form would lead to greater perceptions of coercion; (b) more complex language on the consent form

<sup>5</sup> We understand that the true underlying issue is whether first person language is coercive, not whether participants perceive it as coercive. However, given the limitations of self-report methodology and the importance of perception in psychological research, we believe our data regarding this issue are highly informative. We express thanks to an anonymous reviewer for bringing this issue to our attention.

would lead to worse recall of the content of the form; and (c) a more detailed description of procedural tasks would lead to greater recall of the nature of those tasks.

### 3.1. Method

#### 3.1.1. Participants

The sample for Study 2 consisted of 157 undergraduate students (99 women, 58 men,  $M_{age} = 19.91$  years,  $SD_{age} = 2.09$ ) enrolled in introductory psychology courses at three separate institutions: SFA; Gannon University, a small private institution in northwestern Pennsylvania; and Rochester Institute of Technology, a mid-sized private institution in western New York. There were 100 Caucasians, 36 African Americans, 11 Hispanics, eight Asian Americans, and two participants of other ethnicities. All participants received either required course credit or extra credit in return for their participation.

#### 3.1.2. Materials

**3.1.2.1. Informed consent forms.** Two versions of a standard informed consent form were created for this study. One was written using relatively everyday language, whereas the other was written using more complex psychological jargon. The everyday language form had a Flesch Reading Ease score of 41.7 with an associated Flesch Grade Level of 12.6 (as calculated by Microsoft Word, 2010). The complex jargon form had a Flesch Reading Ease score of 7.0 (lower numbers reflect more difficult reading) with an associated Flesch Grade Level of 18.9 (see Fig. 1 for an example of wording differences between the two forms). Importantly, the basic content of the two forms was the same (and complied with IRB standards). Both included a general description of the study's procedures, contact information for the principal investigator, a statement regarding the voluntary nature of participation and the right to withdraw at any time, information regarding the relevant institution's IRB, a description of the perceived risks and benefits involved in the study, a statement that the participant was not waiving any legal rights by signing the consent form, and a space for a signature and date.

**3.1.2.2. Triangle task and word completion task.** The same triangle task and word completion task from Study 1 were used in Study 2. The nature of each task and its instructions were the same, including the 10-min time limit for each.

**3.1.2.3. Participant perceptions of freedom vs. coercion.** Participants' overall perceptions of freedom vs. coercion in the experimental situation were assessed using the same series of six questions from Study 1, using the same 5-point response scale ranging from *None* or *Not at all* (1) to *Totally* or *Completely* (5). This measure had no time limit.

**3.1.2.4. Consent form quiz.** Participants were administered the same basic "Research Rights Quiz" as Study 1 in order to gauge their recall of the basic content of the informed consent form, but one key difference was that the question that specifically addressed the right to sue the researchers was omitted (thus leaving a total of six questions rather than seven). This measure had no time limit, and was scored via the liberal scoring method from Study 1.

**3.1.2.5. Procedural tasks quiz.** Because one of the manipulations in this study involved providing participants with a greater amount of detail regarding specific procedural tasks (see Design and Procedure subsection below), we included an additional recall measure to assess participants' ability to remember what specific tasks they were going to be asked to perform. This open-ended measure consisted of a single prompt: "Describe the various tasks you will be asked to complete." This measure had no time limit.

I agree to take part in the study titled "Word Completion and Perception" run by Dr. Jeremy Heider, a professor at SFASU. The purpose of this study is to gain a better understanding of memory with a real world use.

I will be asked to do the following: complete a triangle puzzle, several word completion tasks, answer questions related to the experiment, and complete basic personality and demographic questions.

My participation is voluntary, and may be removed at any time without penalty or prejudice. If I have any additional questions concerning this study, I may contact Dr. Jeremy Heider at (936) 468-1584. If I want more information on my rights as a research subject, I may contact the SFASU Office of Research and Sponsored Programs at (936) 468-6606 or [orsp@sfasu.edu](mailto:orsp@sfasu.edu).

This study will take about half an hour. If I take part in the study, I will receive the full credit for taking part in the study.

The intended benefits of this study include a greater understanding of cognitive functioning, with a real world use. At the conclusion of the experiment, I will be given a full set of information concerning the experiment.

The potential risks and/or discomforts I could face during this study include: a challenging word competition task, and direct questions about the study. All information gathered during the study will be kept confidential by having no names linked to the data gathered.

My consent to participate in this project does not surrender any legal rights or redress I might have as a result of my participation, and I acknowledge that I have received a copy of this consent form.

---

Signature and Date

**Everyday terminology:**  
The purpose of this study is to gain a better understanding of memory with a real world use.

**Complex jargon:** The rationale behind this scientific investigation is to enhance knowledge of recognition and recall of stimuli presented to the hippocampus and other anatomical structures related to recall and recognition.

**Fig. 1.** Example of language differences between consent form with everyday terminology and consent form with complex jargon.

**3.1.2.6. Demographics.** Participants reported their age, gender, ethnicity, classification (i.e., freshman, sophomore, junior, or senior), the number of psychology courses they had taken (including current enrollments), and the number of psychological research studies they had participated in (including the current study).

### 3.1.3. Design and Procedure

Two variables were manipulated in Study 2: Consent form complexity and depth of procedural detail. Consent form complexity was manipulated by randomly assigning participants to read either the everyday language consent form or the complex jargon consent form. Depth of procedural detail was manipulated by randomly assigning approximately half of the participants to receive additional details from the experimenter regarding the experimental tasks they would be asked to perform. For those participants who received the additional details, they were delivered immediately after providing the participant with the consent form. Consent form complexity was manipulated at the level of the individual participant; however, additional procedural detail was manipulated at the level of the experimental session. This approach was taken so the experimenter only had to deliver the additional procedural information once to all participants in a given session.

As with Study 1, Study 2 was advertised as an investigation of basic cognitive abilities. Upon arriving at the laboratory, an experimenter (either a graduate or undergraduate research assistant, depending on the session) greeted participants and provided them with the consent form (everyday language or complex jargon). For participants in sessions that were randomly assigned to receive the additional procedural details in addition to the consent form, the experimenter delivered this information verbally at the same time the consent form was presented.

After signing and returning the consent form (no participants refused to do so), each participant sat at a desk and completed a packet containing the various experimental tasks, each on a separate page. The first five tasks – demographic inquiries, triangle task, word completion task, questionnaire on perceptions of the experimental process, and research

rights quiz – were administered exactly as described in Study 1. The procedural tasks quiz was last in the sequence. Total participation time was approximately 30 min.

### 3.1.4. Data analysis strategy

We hypothesized that (a) more complex language on the consent form would lead to greater perceptions of coercion; (b) more complex language on the consent form would lead to worse recall of the content of the form; and (c) a more detailed description of procedural tasks would lead to greater recall of the nature of those tasks. The first hypothesis was tested with a factorial ANOVA using an aggregate score on the perceptions of freedom vs. coercion measure as the dependent variable. The second hypothesis was tested with a factorial ANOVA using overall scores on the consent form quiz as the dependent variable. The third hypothesis was tested with a factorial ANOVA using performance on the procedural details quiz as the dependent variable. We also conducted ANOVAs to examine whether any of the independent variables affected persistence and/or performance on the triangle and word completion tasks.

## 3.2. Results

### 3.2.1. Perceptions of freedom vs. coercion

A 2 (Consent Form Language Complexity: everyday language, complex jargon) x 2 (Depth of Procedural Detail: minimally detailed, highly detailed) between-subjects ANOVA on the perceived freedom questionnaire did not result in a significant main effect of language complexity,  $F(1, 157) = 0.856, p = .36$ . Thus, our hypothesis that complex jargon would result in greater perceptions of coercion was not supported.

### 3.2.2. Knowledge of content of consent form

A 2 (Consent Form Language Complexity: everyday language, complex jargon) x 2 (Depth of Procedural Detail: minimally detailed, highly

detailed) between-subjects ANOVA on the consent for quiz did not yield a significant main effect of language complexity,  $F(1, 157) = 0.241$ ,  $p = .62$ . Thus, our hypothesis regarding worse recall for more complex jargon was not supported.

### 3.2.3. Recall of procedural tasks

A 2 (Consent Form Language Complexity: everyday language, complex jargon)  $\times$  2 (Depth of Procedural Detail: minimally detailed, highly detailed) between-subjects ANOVA on the procedural tasks quiz revealed a significant main effect for Depth of Procedural Detail,  $F(1, 157) = 111.78$ ,  $p < .001$ ,  $\eta_p^2 = 0.421$ . Participants recalled more of the procedural tasks they were going to be asked to perform under highly detailed instructions ( $M = 3.46$ ,  $SD = 1.37$ ) than under minimally detailed instructions ( $M = 1.26$ ,  $SD = 1.23$ ). Thus, our hypothesis regarding the effect of procedural details on participants' ability to recall procedural tasks was supported.

### 3.2.4. Persistence and performance on experimental tasks

The only effect in these analyses was a marginal main effect of Consent Form Language Complexity on amount of time spent on the triangle task,  $F(1, 157) = 2.72$ ,  $p = .101$ ,  $\eta_p^2 = 0.017$ . Participants who received the everyday language consent form ( $M = 4:53$ ,  $SD = 3:04$ ) spent more time on the triangle task than participants who received the complex jargon form ( $M = 4:08$ ,  $SD = 2:40$ ).

## 3.3. Discussion

Given the tendency for certain methodological characteristics to influence perceptions of coercion (e.g., formal laboratory attire; Edlund et al., 2014), we first hypothesized that more complex language on the informed consent form would yield greater perceptions of coercion on the part of our participants. The data did not support this prediction. Our second hypothesis examining the effects of language complexity upon knowledge of the consent form was also not supported, though previous studies (e.g., Bradshaw et al., 1975) have studied samples of medical patients whose average reading ability may have been lower than that of our college student sample. Finally, our third hypothesis, which predicted that participants who received a more detailed verbal description of the procedural tasks from the experimenter would better be able to remember the nature of those tasks when quizzed a few moments later, was supported.

Additionally, we did not make any specific predictions regarding persistence and/or performance on the triangle and word completion tasks, but we did observe a marginally significant main effect of the complexity of the language in the consent form whereby participants who read the consent form with everyday language spent more time on the triangle task than participants who read the consent form with complex jargon. We speculate that reading complex jargon may have decreased participants' motivation to spend time working on experimental tasks (or at least one of those tasks), perhaps in a manner that could be explained via the ego depletion model, which has found that effort exerted on one task can decrease the effort expended in other parts of life (Baumeister et al., 1998).

Certainly, more research is needed before definitive advice can be given from the current study, especially considering one of the key effects was only marginally significant. However, any suggestions that might reduce error variance should be welcomed by researchers. With this thought in mind, the data from Study 2 suggest two conclusions: (1) providing a more detailed explanation at the outset of an

experiment can help participants remember more details about the experimental procedure; and (2) using more complicated jargon in a consent form may lead to decreased motivation on task performance. Though we acknowledge that participants' ability to remember procedural details is less important than their ability to remember their legal rights and a study's risks, these outcomes nonetheless create a paradox that requires follow up research: If we use more complex, thorough language, it seems that one of the key rationales for seeking informed consent (ensuring that a participant understands what is expected of him or her) is met. However, in doing so, the data suggest that we may be discouraging our research participants in terms of task motivation, hence decreasing the validity of the research itself.

## 4. General discussion

Researchers are trained to be wary of and overcome the obvious shortcomings inherent in inferential statistics. Among other things, we use double-blind designs with random assignment to conditions, we have extensive research protocols in order to ensure that every research participant has the same experience, and we pre-test our materials and probe our participants at the end of our studies. Scientists are taught to attend to such minutiae as to eliminate confounds that might muddy our research findings and to ensure that every experiment we conduct is in compliance with laws that govern the treatment of human research participants.

Despite this level of oversight, limited information has been collected to examine how the presentation and content of the informed consent influences participant behavior. This may be a significant oversight, as the present research suggests that (1) language perspective (first, second, or third person) does not affect participant perceptions of coercion, at least within psychology student samples; (2) participants who are verbally informed of their right to sue demonstrate less knowledge of their research rights; (3) the number of experimental participants in a room may affect persistence on experimental tasks; and (4) more complex jargon in informed consent statements seems to lead to better comprehension of the informed consent but (5) diminishes effort put forth on the experimental tasks.

This research is especially timely with the shift (most notably in psychology) towards rigorous replication of research (supported by the Center for Open Science; <http://centerforopenscience.org/>). One could argue that minute differences in informed consent word choice may actually have a significant impact on research writ large, up to and including rendering a significant finding non-significant. It does not seem too far-fetched to imagine a situation in which one experiment used an informed consent that increased participant engagement and decreased feelings of coercion, whereas its replication did the opposite and, thus, influenced experimental findings. Further research investigating features of the informed consent may eventually coalesce into best practices to be followed. If this goal were achieved, it may eliminate confounds that decrease replicability.

### 4.1. Future directions

Based on our findings from this paper, more research is necessary before firm best practices can be recommended. However, some preliminary suggestions can be provided: Generally, the specific perspective of prose (first, second, or third person) does not directly affect participants – at least among traditional psychology-based student samples (see also Edlund et al., 2014). Additionally, depending on the intent of one's research, the present findings provide specific advice. If the purpose of one's study is to ask for a great



amount of attention from participants for a limited amount of time, we would suggest using less jargon in one's informed consent. However, if one is asking for informed consent in a more high-stakes situation, like consenting to surgery, then it may be preferable to use more in-depth language as to encourage patients to remember more details of the informed consent.

Per our best practice recommendations, further research is necessary in order to completely understand the nuances of the informed consent procedure and how these nuances affect research participants. As such, we recommend research looking into (1) different circumstances in which informed consent is necessary (social science research, clinical trials, consent to medical treatment, etc.); (2) the specific influence of legal jargon on participant perceptions of possible danger or harm related to the research and how this may lead to increased participant attention; and (3) whether feelings of perceived loss of free will are more strongly

associated with young adults, some of whom are still adolescents, or whether these findings apply broadly to a wide range of adult populations.

**Conflict of 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**

*Participant Perceptions of Freedom vs. Coercion*

1. How much freedom did you feel in choosing to participate in this study?

1	2	3	4	5
No freedom				Complete freedom

2. How manipulated did you feel by this research?

1	2	3	4	5
Not at all manipulated				Totally Manipulated

3. How much freedom did you feel in choosing to decline to participate in any part of this research?

1	2	3	4	5
No freedom				Complete freedom

4. How comfortable did you feel with this research?

1	2	3	4	5
Not at all comfortable				Completely comfortable

5. How comfortable did you feel in interacting with the research assistant who gave you these forms (please note that the research assistant will not see these responses)?

1	2	3	4	5
Not at all comfortable				Completely comfortable

6. How fair do you perceive the research process as being?

1	2	3	4	5
Not at all fair				Completely fair

**Appendix B**

*Research Rights Quiz*

1. Who can you contact if you have any questions about this research?
2. Who should you contact if you have questions about your rights as a research participant?
3. Are you allowed to leave the experiment at any time?
4. How long did the consent form estimate this experiment taking?
5. What was the purpose of this research according to the consent form?
6. What potential risks or discomforts did the consent form suggest you might have?
7. If something goes wrong in this experiment can you sue the researcher?

## Appendix C

### Experimenter Scripts Used for Right to Sue Information Conditions

#### Right to Sue Information Condition:

"Here is an informed consent form. Please read the form and sign it as an indication of your willingness to participate. By signing the form, you do not give up any legal rights to take action against the experimenter. The form is designed to protect you, the participant. Should you have any questions regarding your rights as a participant, you can contact the SFASU Office of Research and Sponsored Programs using the information provided on the form. If you have any questions about the experiment or the form, I would be happy to answer it to the best of my abilities. Okay?"

#### No Right to Sue Information Condition:

"Here is an informed consent form. Please read it over, and sign at the end if you are willing to participate in the experiment. If you have any questions about the experiment or the form, I would be happy to answer it to the best of my abilities. Okay?"

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