Adjs Soc-Phys Weighted/Normed: Reaction Time Graphs

morgan moyer

2025-05-28

What's going on with those parts only in Valence task?

```
table(d$Group, d$Response)
```

```
## < table of extent 0 x 4 >
```

```
# Step 1: Summarize per ID.Ibex
ids_valence_only <- d %>%
  group_by(ID.true) %>%
  summarise(
    has_valence = any(Task == "Valence"),
    has_socphys = any(Task == "SocPhys"),
    .groups = "drop"
  ) %>%
  filter(has_valence & !has_socphys) %>%
  pull(ID.true)


d_bad <- d %>%
  filter(ID.true %in% ids_valence_only)

print(unique(d_bad$Response))
```

```
## [1] "negative" "positive"
```

```
print(table(d$Response))
```

```
##
## negative physical positive   social
##     1240      740     1160     1060
```

```
d <- d %>%
  filter(!ID.true %in% ids_valence_only)
```

Looking at overall Log ReactionTime for the data

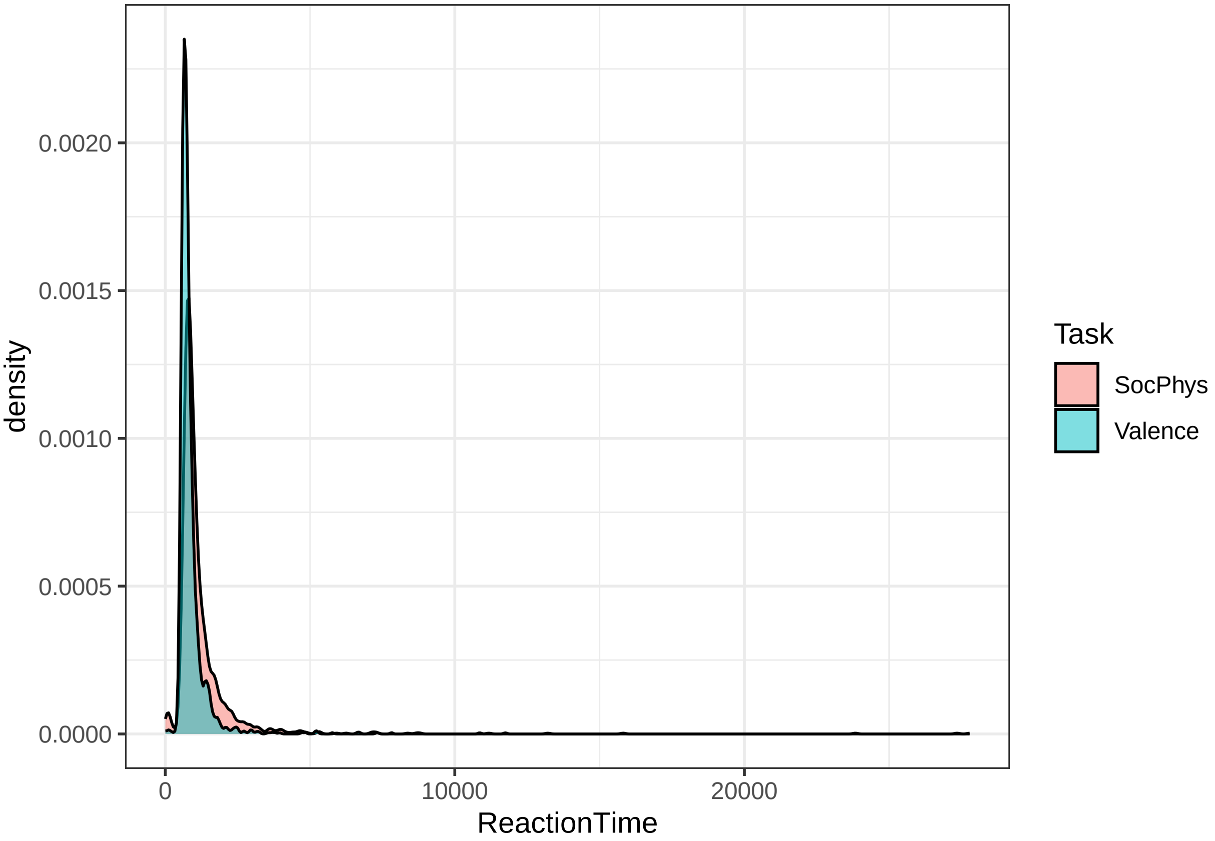
Before removing outliers

Summary Stats

```
agr <- d %>%
  group_by(Task) %>%
  summarize(MeanRT = mean(ReactionTime),
            SD = sd(ReactionTime),
            MeanLogRT = mean(LogReactionTime))
print(agr)
```

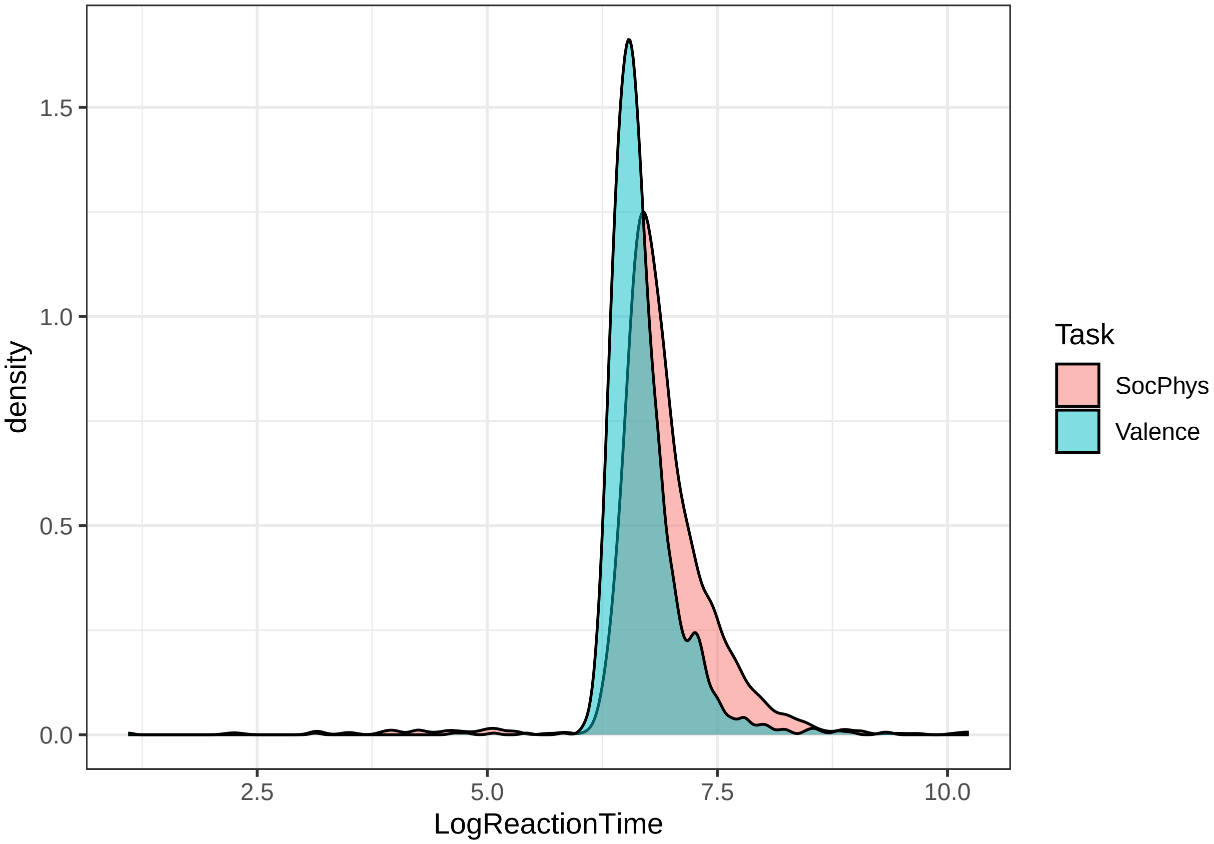
```
## # A tibble: 2 x 4
##   Task    MeanRT    SD MeanLogRT
##   <chr>    <dbl> <dbl>     <dbl>
## 1 SocPhys  1215. 1394.      6.90
## 2 Valence   878.  637.      6.68
```

```
ggplot(d, aes(ReactionTime, fill=Task)) +
  geom_density(alpha = .5)
```



Long tail justifies outlier removal?

```
ggplot(d, aes(LogReactionTime, fill=Task)) +
  geom_density(alpha = .5)
```



```
summary(d$LogReactionTime)
```

```
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max. 
##   1.099   6.522   6.708   6.790   6.980  10.232
```

First Remove participants who aren't super , aggregating over Task

```
length(unique(d$ID.true))
```

```
## [1] 15
```

```
inacc.parts <- d %>%
  group_by(ID.true,Task) %>%
  summarise(MeanAccuracy = mean(Accuracy)) %>%
  filter(MeanAccuracy < .75)
```

```
## `summarise()` has grouped output by 'ID.true'. You can override using the
## `.groups` argument.
```

```
# How many participants have Accuracy < .75?
length(unique(inacc.parts$ID.true))
```

```
## [1] 4
```

```
d.inaccurate.removed <- d %>%
  anti_join(inacc.parts, by = "ID.true")

# Sanity check
```

```
length(unique(d.inaccurate.removed$ID.true))
```

```
## [1] 11
```

```
# remove all inaccurate trials

orig <- nrow(d.inaccurate.removed)
d.inaccurate.removed <- d.inaccurate.removed %>%
  filter(Accuracy == 1)
nrow(d.inaccurate.removed)/orig*100
```

```
## [1] 92.87879
```

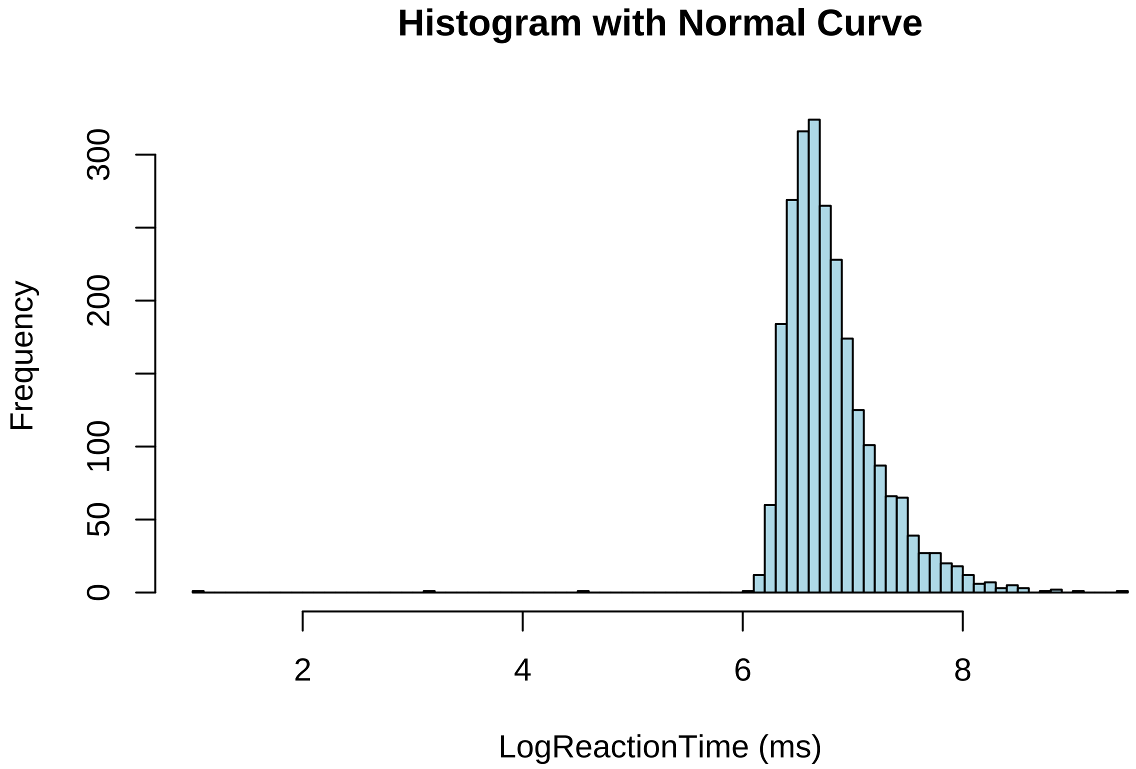
```
# Remove subjects with ReactionTime higher than 3x IQR
summary(d.inaccurate.removed$LogReactionTime)
```

```
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##   1.099   6.529   6.721   6.813   7.002   9.489
```

```
  #  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  # 6.924   7.328   7.436   7.479   7.579  10.008
range(d.inaccurate.removed$LogReactionTime)
```

```
## [1] 1.098612 9.488805
```

```
hist(d.inaccurate.removed$LogReactionTime, breaks=100, col="lightblue", xlab="LogReactionTime (ms)",
        main="Histogram with Normal Curve")
```



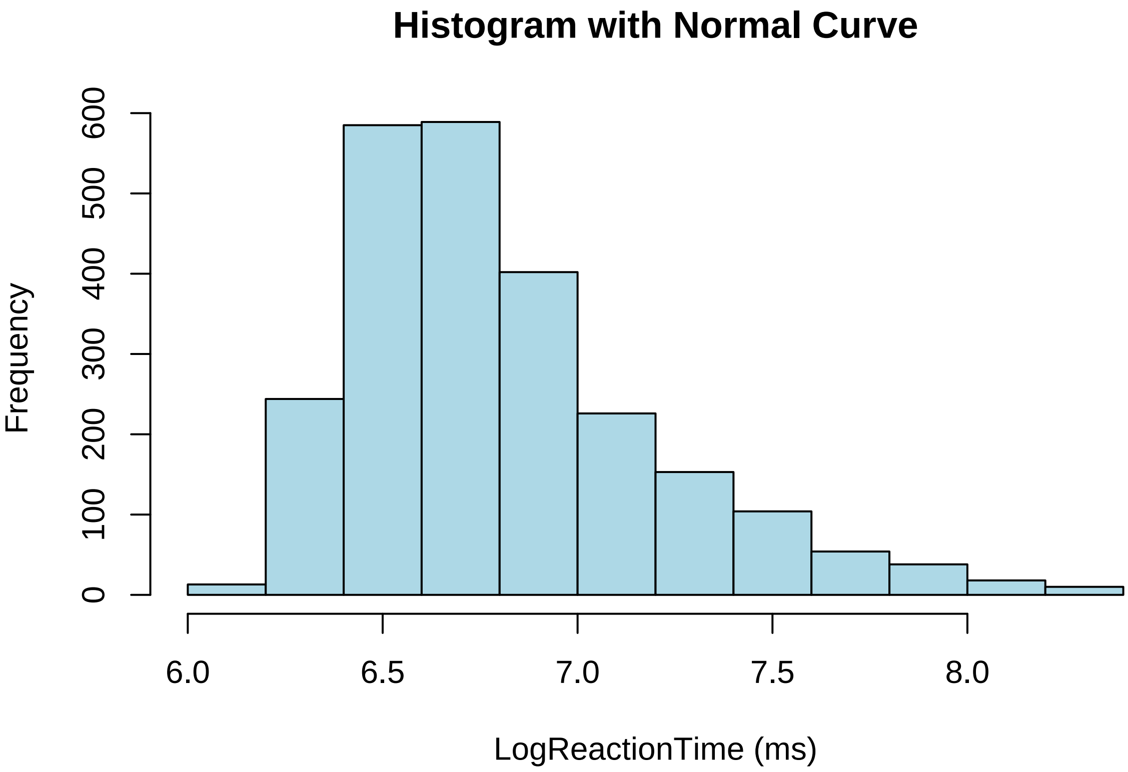
```
quantile(d.inaccurate.removed$LogReactionTime, na.rm = TRUE)
```

```
##       0%      25%      50%      75%     100%
## 1.098612 6.529419 6.721426 7.002383 9.488805
```

```
IQR(d.inaccurate.removed$LogReactionTime, na.rm = TRUE)*3 # 0.7526289
```

```
## [1] 1.418893
```

```
cutoff.high <- quantile(d.inaccurate.removed$LogReactionTime, na.rm = TRUE)[4] + IQR(d.inaccurate.remove
cutoff.low <- quantile(d.inaccurate.removed$LogReactionTime, na.rm = TRUE)[2] - IQR(d.inaccurate.remove


# remove subjects with ReactionTime higher than 3 x IQR
df.outliers.removed <- subset(d.inaccurate.removed, (d.inaccurate.removed$LogReactionTime > cutoff.low)

hist(df.outliers.removed$LogReactionTime, col="lightblue", xlab="LogReactionTime (ms)",
        main="Histogram with Normal Curve")
```



Summary Stats

```
agr <- df.outliers.removed %>%
  group_by(Task) %>%
  summarize(MeanReactionTime = mean(ReactionTime),
            SD = sd(ReactionTime),
            MeanLogReactionTime = mean(LogReactionTime))
print(agr)
```

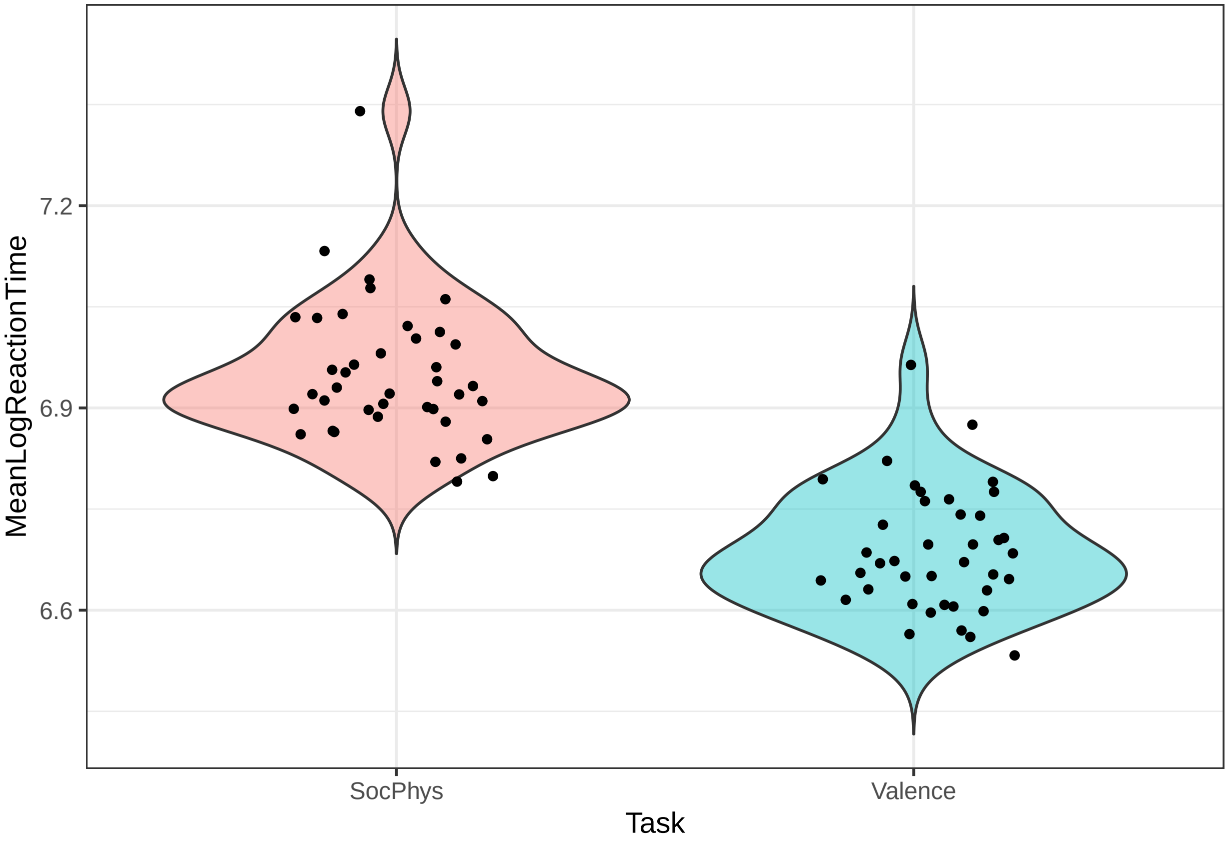
```
## # A tibble: 2 x 4
##   Task    MeanReactionTime    SD MeanLogReactionTime
##   <chr>              <dbl> <dbl>               <dbl>
## 1 SocPhys            1132.  571.                6.94
## 2 Valence             854.  382.                6.68
```

LogReactionTime by Task

```
agr <- df.outliers.removed %>%
    group_by(Task,Word) %>%
    summarize(MeanLogReactionTime = mean(LogReactionTime),
              CILow = ci.low(LogReactionTime),
              CIHigh = ci.high(LogReactionTime)) %>%
    mutate(YMin = MeanLogReactionTime - CILow,
           YMax = MeanLogReactionTime + CIHigh)
```

```
## `summarise()` has grouped output by 'Task'. You can override using the
## `.groups` argument.
```

```
ggplot(agr, aes(x=Task, y=MeanLogReactionTime,fill=Task)) +
    geom_violin(trim=FALSE,alpha=.4) +
    geom_jitter(shape=16, position=position_jitter(0.2)) +
  guides(fill = "none")
```

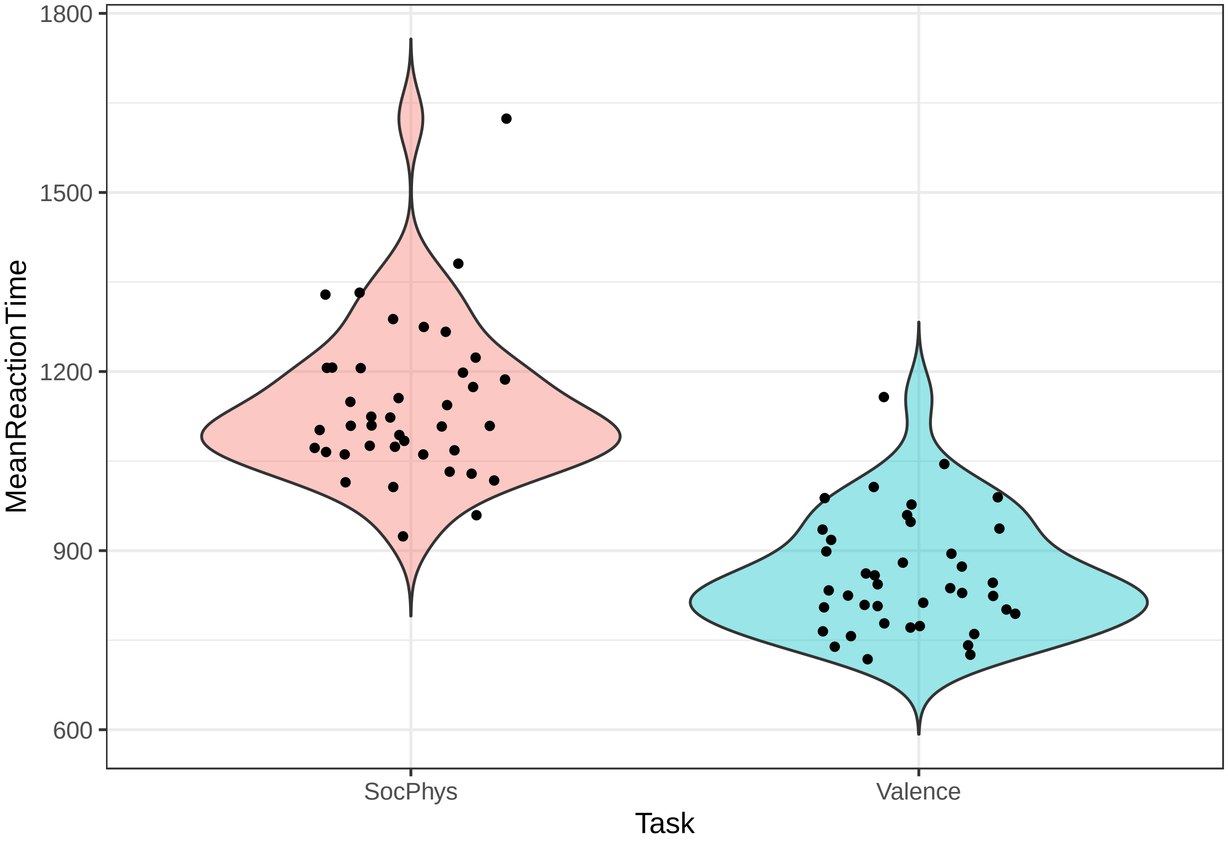


ReactionTime by Task

```
agr <- df.outliers.removed %>%
    group_by(Task,Word) %>%
    summarize(MeanReactionTime = mean(ReactionTime),
              CILow = ci.low(ReactionTime),
              CIHigh = ci.high(ReactionTime)) %>%
    mutate(YMin = MeanReactionTime - CILow,
           YMax = MeanReactionTime + CIHigh)
```

```
## `summarise()` has grouped output by 'Task'. You can override using the
## `.groups` argument.
```

```
ggplot(agr, aes(x=Task, y=MeanReactionTime,fill=Task)) +
    geom_violin(trim=FALSE,alpha=.4) +
    geom_jitter(shape=16, position=position_jitter(0.2)) +
  guides(fill = "none")
```



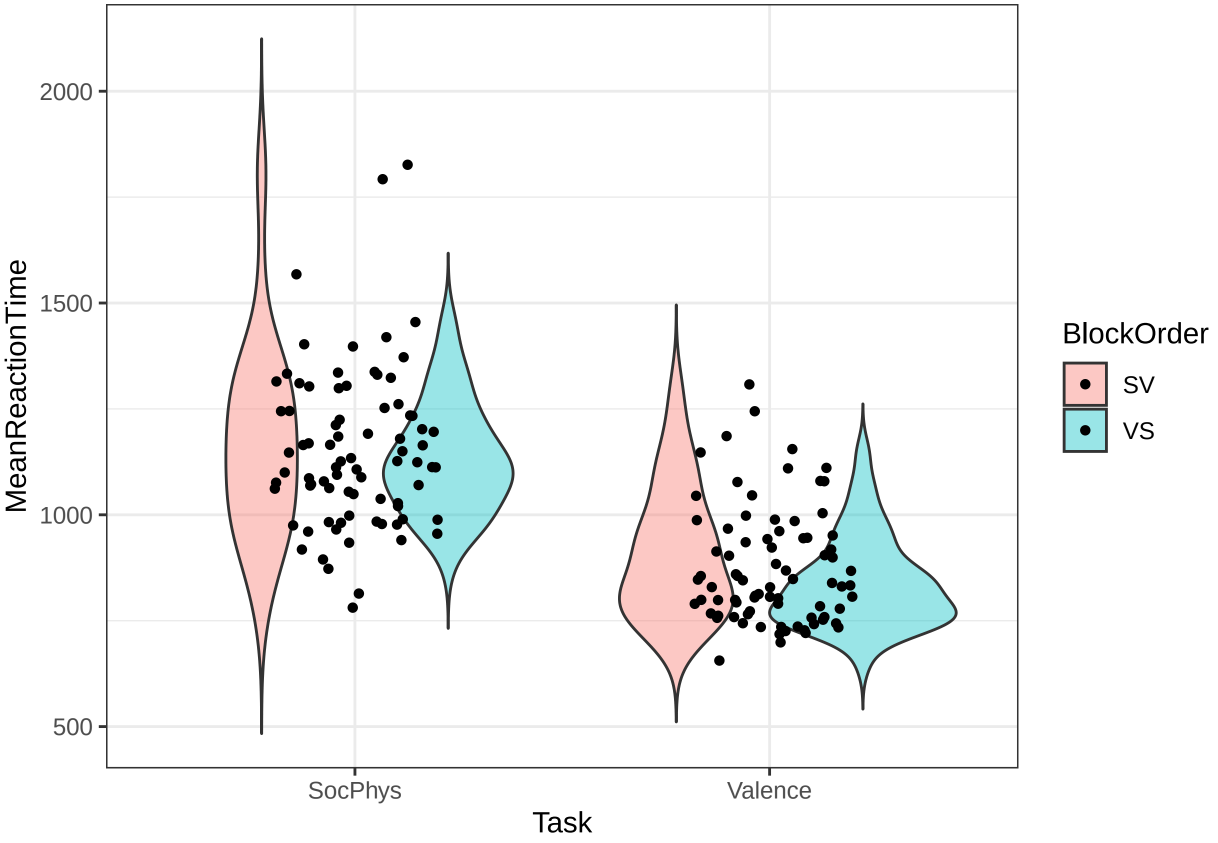
```
ggsave("../graphs/exp2b_abs.pdf",width = 3, height = 2)
ggsave("../graphs/exp2b_pres.pdf",width = 5, height = 4)
```

ReactionTime by BlockOrder and Task

```
agr <- df.outliers.removed %>%
    group_by(BlockOrder,Task,Word) %>%
    summarize(MeanReactionTime = mean(ReactionTime),
              CILow = ci.low(ReactionTime),
              CIHigh = ci.high(ReactionTime)) %>%
    mutate(YMin = MeanReactionTime - CILow,
           YMax = MeanReactionTime + CIHigh)
```

```
## `summarise()` has grouped output by 'BlockOrder', 'Task'. You can override
## using the `.groups` argument.
```

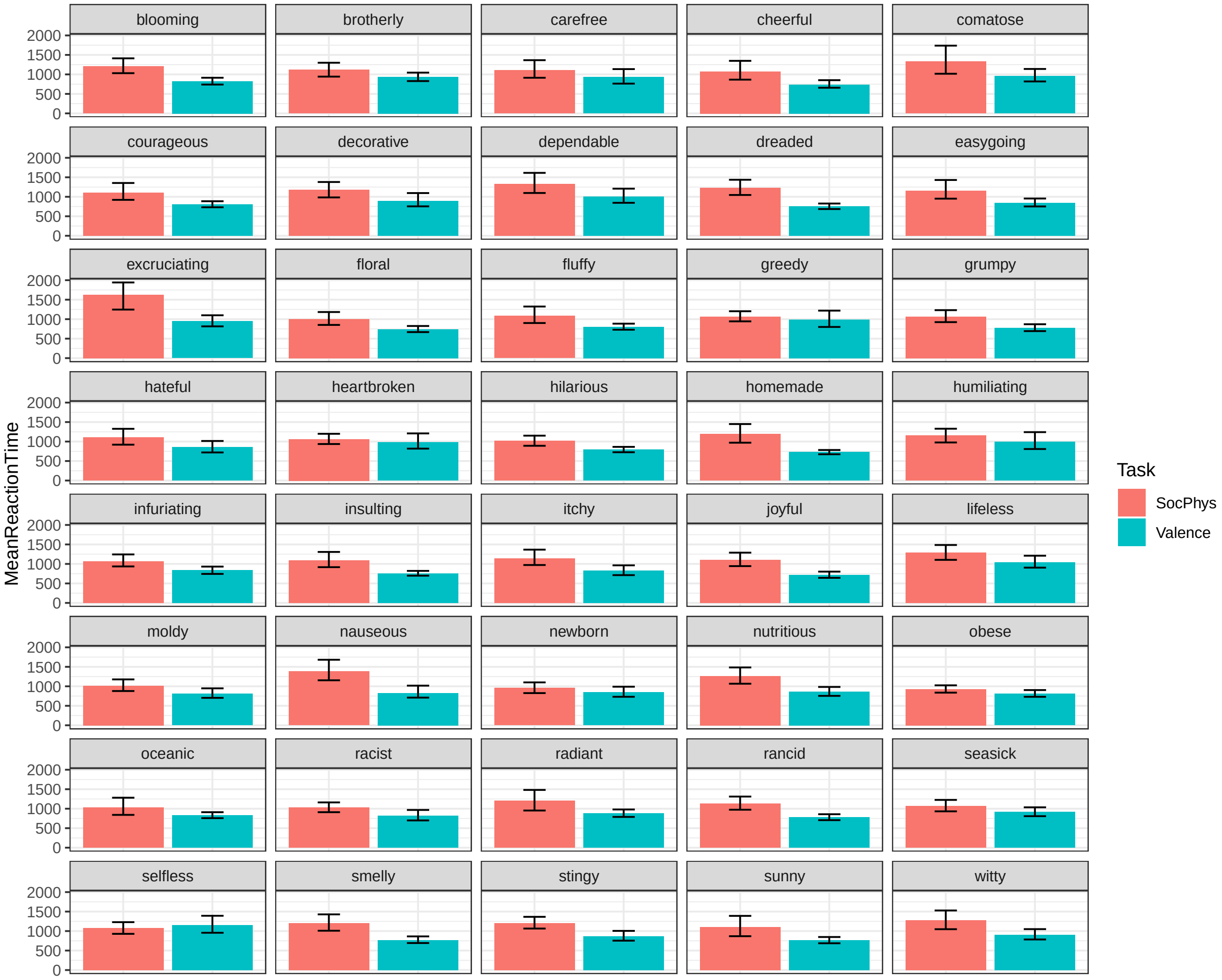
```
ggplot(agr, aes(x=Task, y=MeanReactionTime,fill=BlockOrder)) +
    geom_violin(trim=FALSE,alpha=.4) +
    geom_jitter(shape=16, position=position_jitter(0.2))
```



```
agr <- df.outliers.removed %>%
    group_by(Task,Word) %>%
    summarize(MeanReactionTime = mean(ReactionTime),
              CILow = ci.low(ReactionTime),
              CIHigh = ci.high(ReactionTime)) %>%
    mutate(YMin = MeanReactionTime - CILow,
           YMax = MeanReactionTime + CIHigh)
```

```
## `summarise()` has grouped output by 'Task'. You can override using the
## `.groups` argument.
```

```
dodge = position_dodge(.9)
ggplot(data=agr, aes(x=Task,y=MeanReactionTime,fill=Task)) +
  geom_bar(position=dodge,stat="identity") +
  facet_wrap(~Word,ncol=5) +
  geom_errorbar(aes(ymin=YMin,ymax=YMax),width=.25,position=position_dodge(0.9)) +
  # theme(axis.text.x = element_text(angle = 45, hjust = 1))
  theme(axis.title.x=element_blank(),
        axis.text.x=element_blank(),
        axis.ticks.x=element_blank())
```



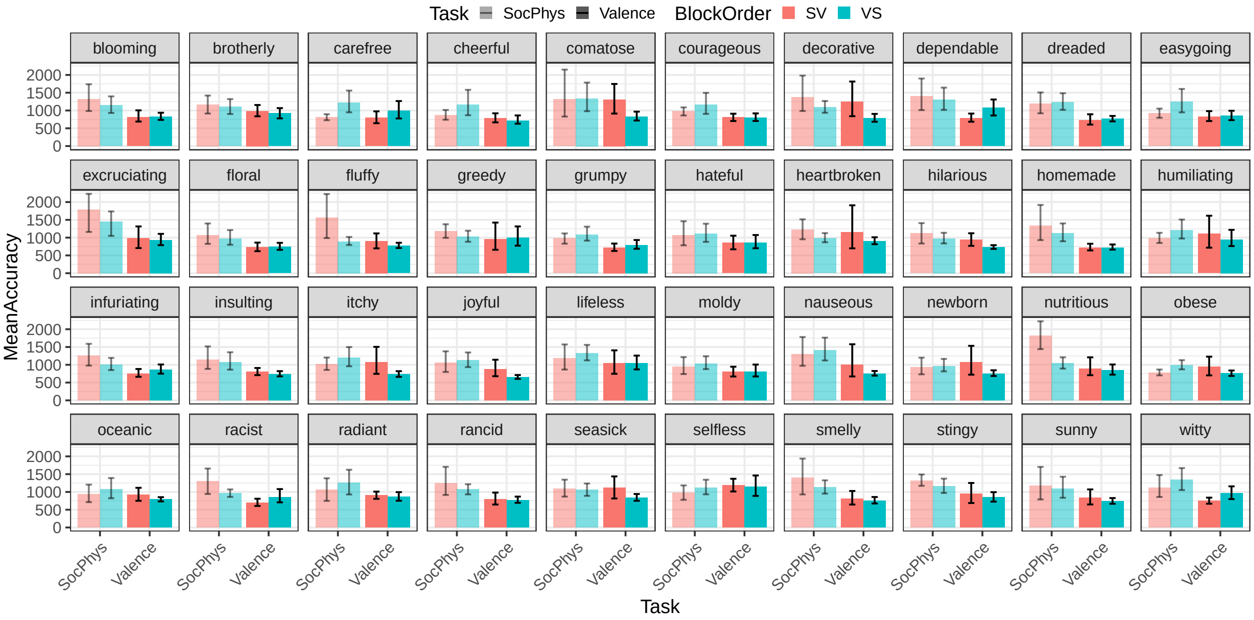
```
  # guides(fill = "none")

ggsave("../graphs/exp2b_items.pdf",width = 8, height = 6)
```

```
agr <- df.outliers.removed %>%
    group_by(Task,Word,BlockOrder) %>%
    summarize(MeanReactionTime = mean(ReactionTime),
              CILow = ci.low(ReactionTime),
              CIHigh = ci.high(ReactionTime)) %>%
    mutate(YMin = MeanReactionTime - CILow,
           YMax = MeanReactionTime + CIHigh)
```

```
## `summarise()` has grouped output by 'Task', 'Word'. You can override using the
## `.groups` argument.
```

```
ggplot(agr,aes(x=Task, y=MeanReactionTime, alpha=Task, fill=BlockOrder)) +
  geom_bar(position="dodge",stat="identity") +
  geom_errorbar(aes(ymin=YMin,ymax=YMax),width=.25,position=position_dodge(0.9)) +
  facet_wrap(~Word, ncol=10) +
  xlab("Task") +
  ylab("MeanAccuracy") +
  # guides(fill=FALSE) +
  # guides(alpha=guide_legend(title="Task")) +
  theme(legend.key.size = unit(0.3, "cm"),
        legend.position = "top", # c(.5,1)
        legend.direction = "horizontal",
        legend.margin=margin(0,0,0,0),
        legend.box.margin=margin(0,0,-5,-5),legend.spacing.y = unit(0.001, 'cm')) +
    # scale_fill_manual(values=cbPalette) +
    # scale_color_manual(values=cbPalette) +
    scale_alpha_discrete(range = c(.5,1)) +
    theme(axis.text.x = element_text(angle = 45, hjust = 1))
```

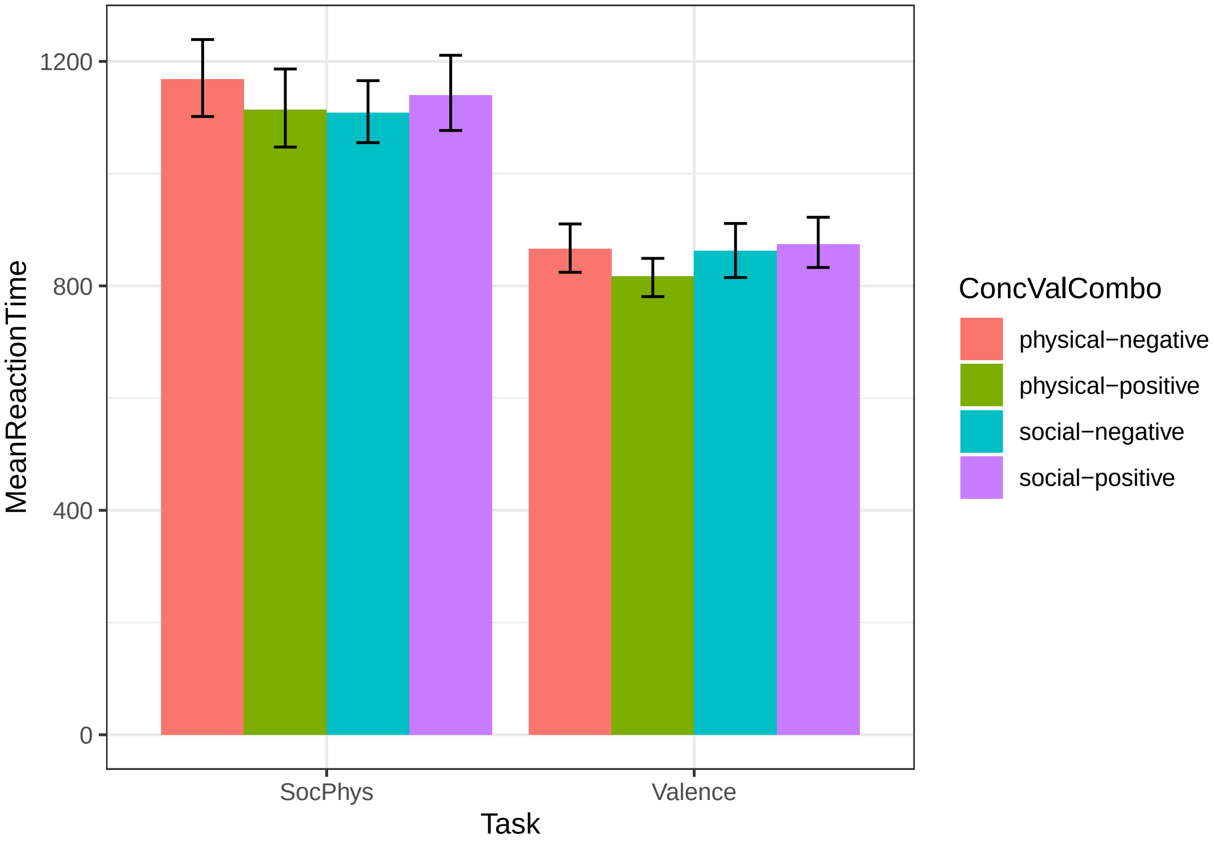
```
## Warning: Using alpha for a discrete variable is not advised.
```



By ConcValCombo category and Task

Mean Raw ReactionTime and Effects of Word Valence/Concreteness

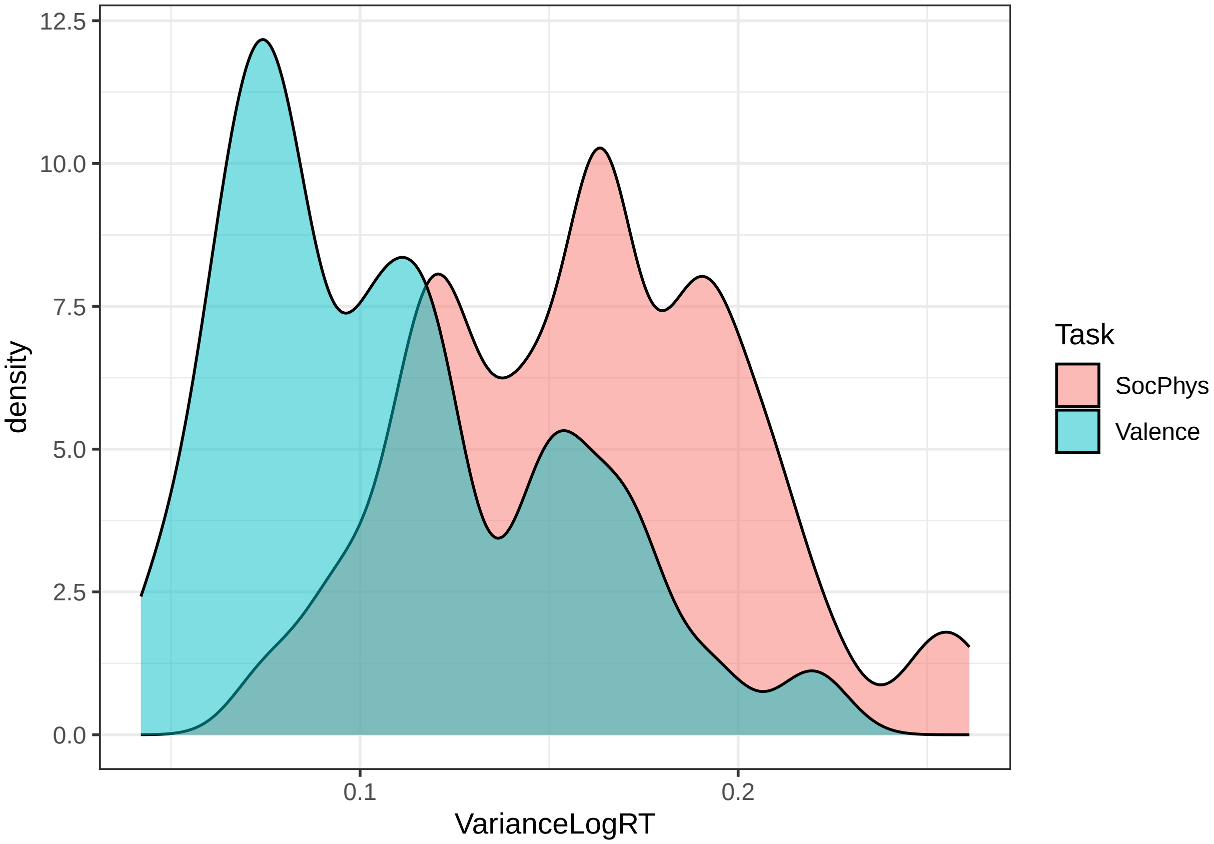
```
agr <- df.outliers.removed %>%
    group_by(Task,ConcValCombo) %>%
    reframe(MeanReactionTime = mean(ReactionTime), CILow = ci.low(ReactionTime), CIHigh = ci.high(React
    mutate(YMin = MeanReactionTime - CILow, YMax = MeanReactionTime + CIHigh)

dodge = position_dodge(.9)
ggplot(data=agr, aes(x=Task,y=MeanReactionTime,fill=ConcValCombo)) +
  geom_bar(position=dodge,stat="identity") +
  # facet_wrap(~Task) +
  geom_errorbar(aes(ymin=YMin,ymax=YMax),width=.25,position=position_dodge(0.9))
```



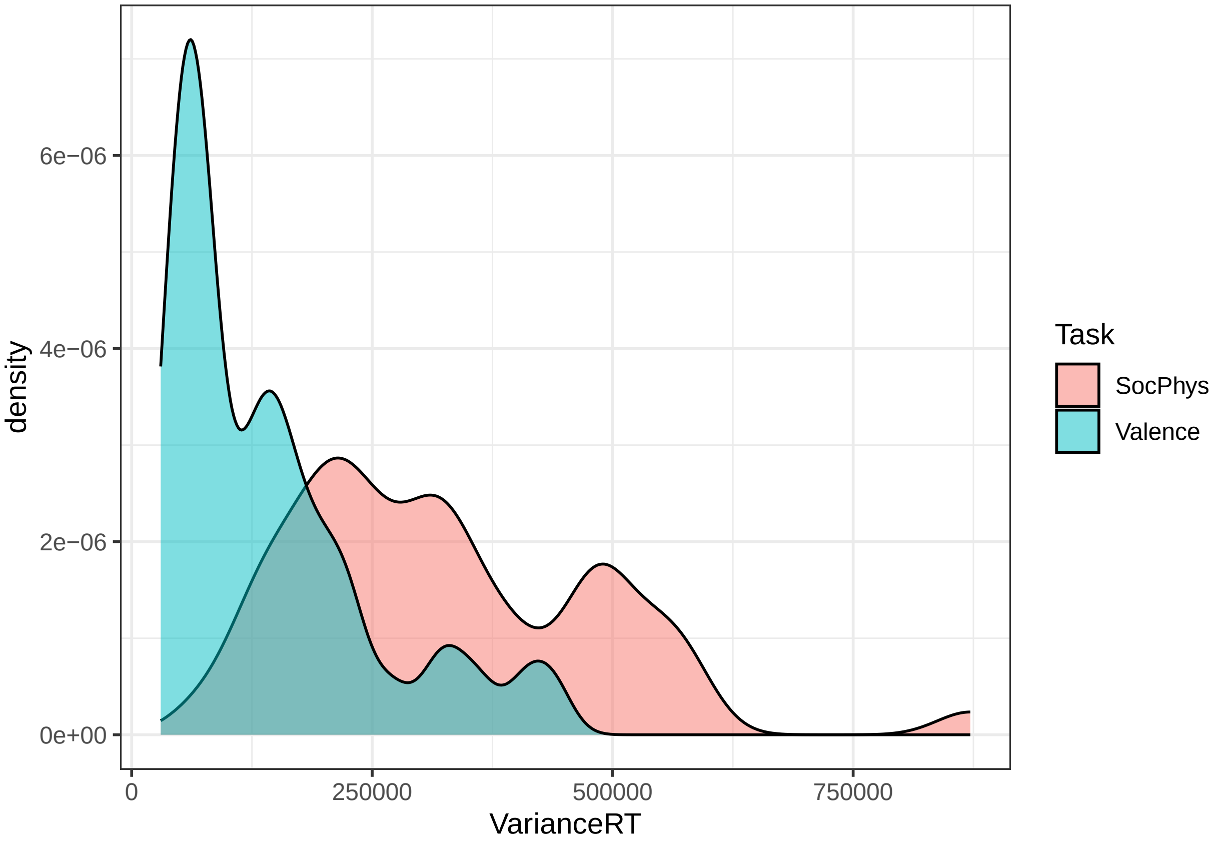
```
  # theme(axis.text.x = element_text(angle = 45, hjust = 1))
  # guides(fill = "none")
```

Variance

```
agr <- df.outliers.removed %>%
  group_by(Task,Word) %>%
  mutate(VarianceLogRT = var(LogReactionTime))

ggplot(agr, aes(VarianceLogRT, fill=Task)) +
  geom_density(alpha = .5)
```



```r
agr <- df.outliers.removed %>%
  group_by(Task,Word) %>%
  mutate(VarianceRT = var(ReactionTime))

ggplot(agr, aes(VarianceRT, fill=Task)) +
  geom_density(alpha = .5)
```

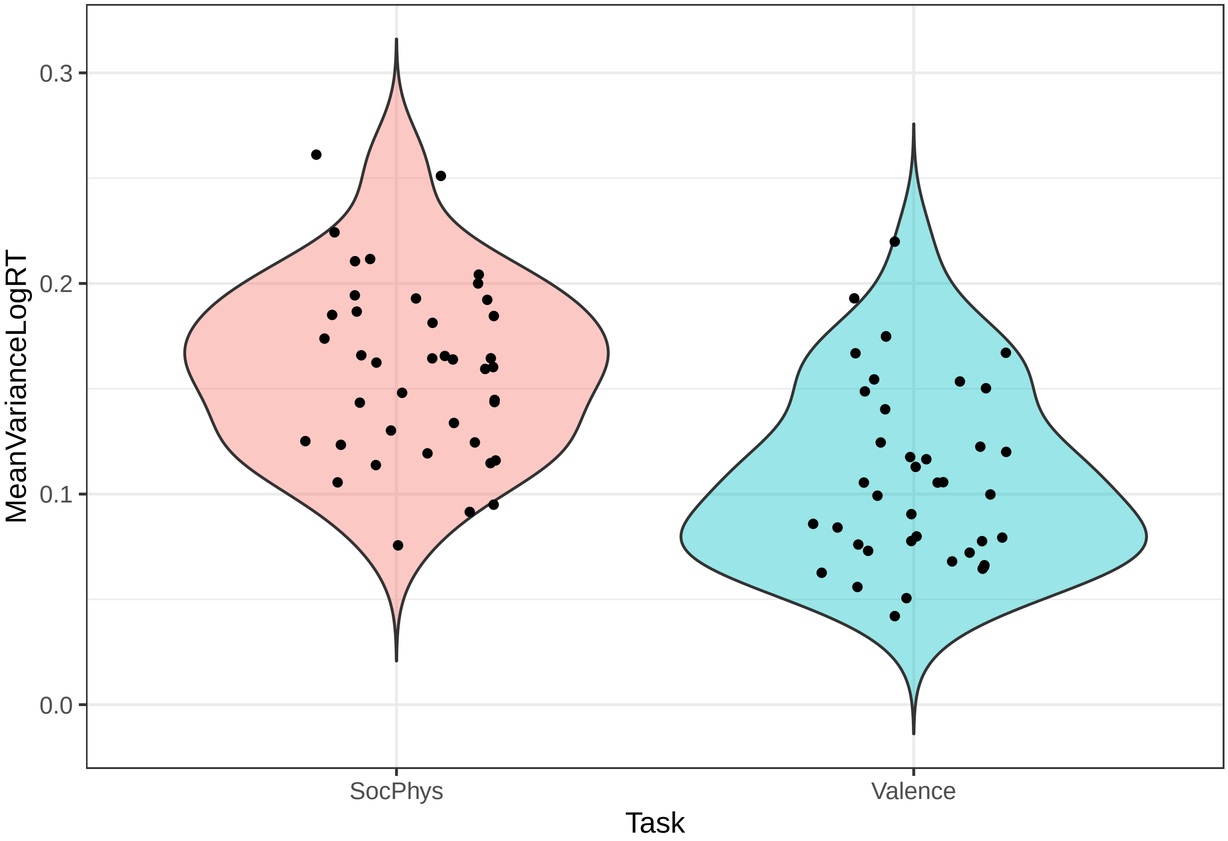


ReactionTime by Task

```
agr <- df.outliers.removed %>%
    group_by(Task,Word) %>%
    mutate(VarianceLogRT = var(LogReactionTime)) %>%
    summarize(MeanVarianceLogRT = mean(VarianceLogRT),
              CILow = ci.low(VarianceLogRT),
              CIHigh = ci.high(VarianceLogRT)) %>%
    mutate(YMin = MeanVarianceLogRT - CILow,
           YMax = MeanVarianceLogRT + CIHigh)
```

```
## `summarise()` has grouped output by 'Task'. You can override using the
## `.groups` argument.
```

```
ggplot(agr, aes(x=Task, y=MeanVarianceLogRT,fill=Task)) +
    geom_violin(trim=FALSE,alpha=.4) +
    geom_jitter(shape=16, position=position_jitter(0.2)) +
  guides(fill = "none")
```

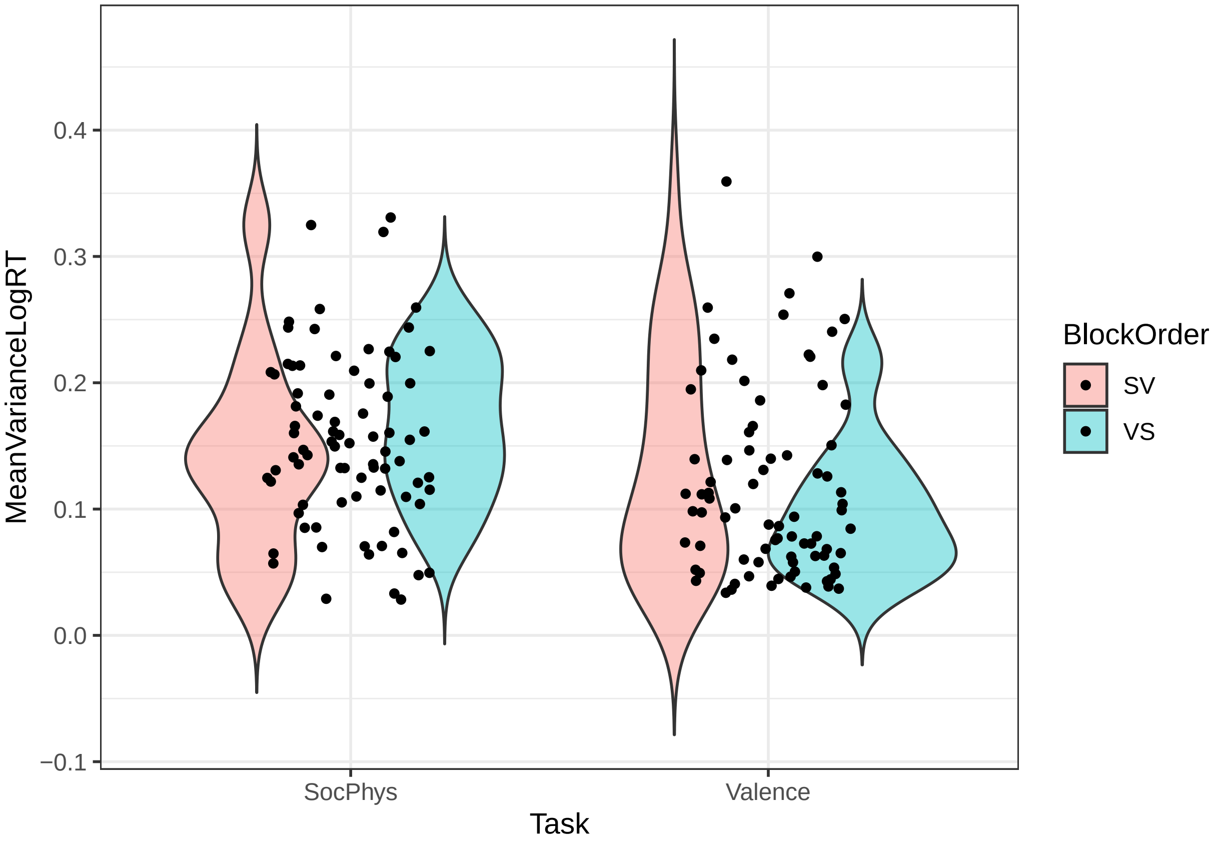


LogReactionTime by BlockOrder and Task

```
agr <- df.outliers.removed %>%
    group_by(BlockOrder,Task,Word) %>%
    mutate(VarianceLogRT = var(LogReactionTime)) %>%
    summarize(MeanVarianceLogRT = mean(VarianceLogRT),
              CILow = ci.low(VarianceLogRT),
              CIHigh = ci.high(VarianceLogRT)) %>%
    mutate(YMin = MeanVarianceLogRT - CILow,
           YMax = MeanVarianceLogRT + CIHigh)
```

```
## `summarise()` has grouped output by 'BlockOrder', 'Task'. You can override
## using the `.groups` argument.
```

```
ggplot(agr, aes(x=Task, y=MeanVarianceLogRT,fill=BlockOrder)) +
    geom_violin(trim=FALSE,alpha=.4) +
    geom_jitter(shape=16, position=position_jitter(0.2))
```

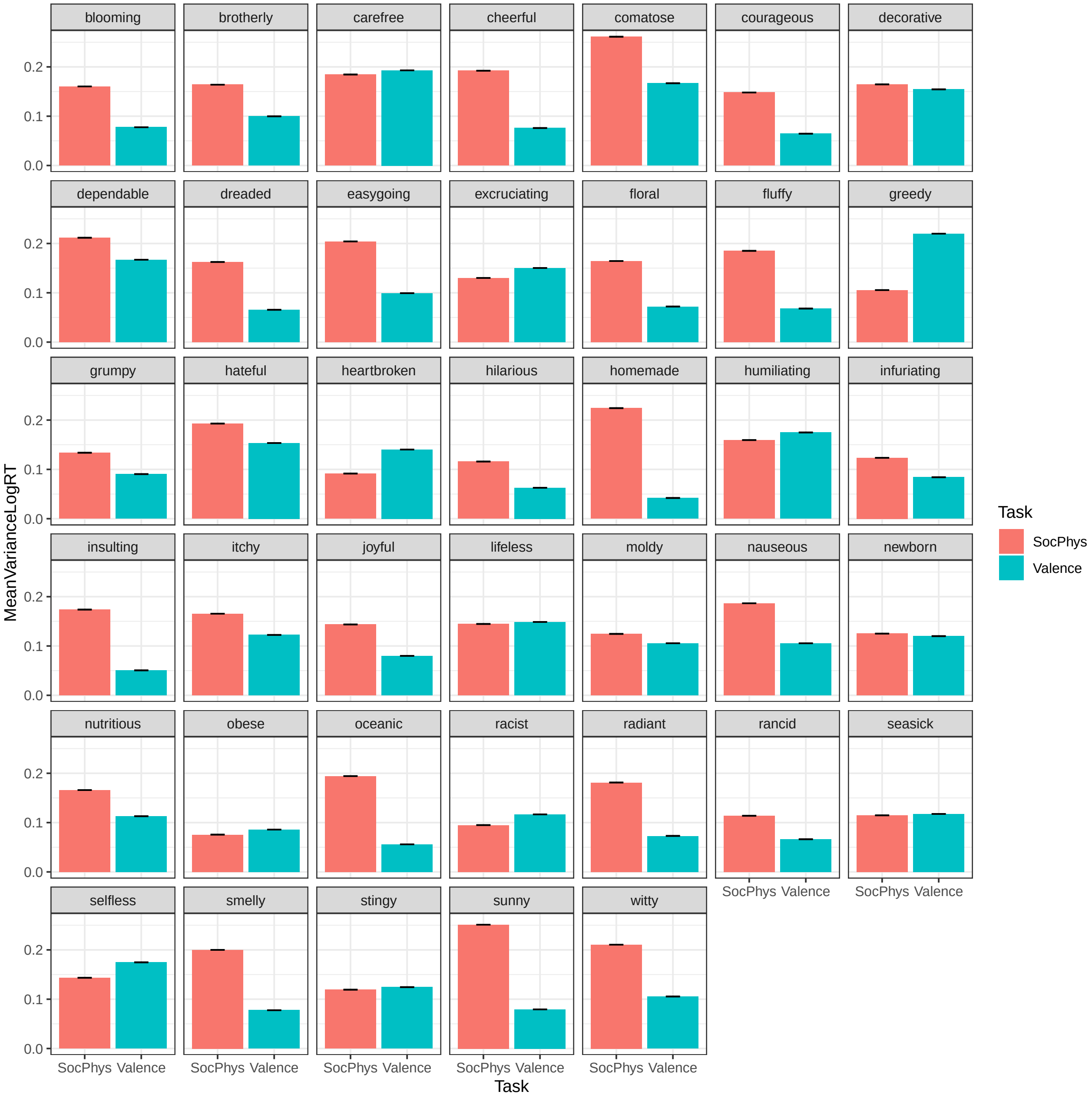


By Item

```
agr <- df.outliers.removed %>%
    group_by(Task,Word) %>%
    mutate(VarianceLogRT = var(LogReactionTime)) %>%
    summarize(MeanVarianceLogRT = mean(VarianceLogRT),
              CILow = ci.low(VarianceLogRT),
              CIHigh = ci.high(VarianceLogRT)) %>%
    mutate(YMin = MeanVarianceLogRT - CILow,
           YMax = MeanVarianceLogRT + CIHigh)
```

```
## `summarise()` has grouped output by 'Task'. You can override using the
## `.groups` argument.
```

```
dodge = position_dodge(.9)
ggplot(data=agr, aes(x=Task,y=MeanVarianceLogRT,fill=Task)) +
  geom_bar(position=dodge,stat="identity") +
  facet_wrap(~Word) +
  geom_errorbar(aes(ymin=YMin,ymax=YMax),width=.25,position=position_dodge(0.9))
```



```
# theme(axis.text.x = element_text(angle = 45, hjust = 1))
# guides(fill = "none")
```