Selecting

DATA MANIPULATION WITH DPLYR

Chris Cardillo
Data Scientist

Select

```
counties %>%
  select(state, county, population, unemployment)
```

```
# A tibble: 3,138 x 4
   state   county   population unemployment
   <chr>   <chr>         <dbl>        <dbl>
 1 Alabama Autauga       55221          7.6
 2 Alabama Baldwin      195121          7.5
 3 Alabama Barbour       26932         17.6
 4 Alabama Bibb          22604          8.3
 5 Alabama Blount        57710          7.7
 6 Alabama Bullock       10678         18  
 7 Alabama Butler        20354         10.9
 8 Alabama Calhoun      116648         12.3
 9 Alabama Chambers      34079          8.9
10 Alabama Cherokee      26008          7.9
# … with 3,128 more rows
```

Select a range

```
counties %>%
  select(state, county, drive:work_at_home)
```

```
# A tibble: 3,138 x 8
   state   county   drive carpool transit  walk other_transp work_at_home
   <chr>   <chr>    <dbl>   <dbl>   <dbl> <dbl>        <dbl>        <dbl>
 1 Alabama Autauga   87.5     8.8     0.1   0.5          1.3          1.8
 2 Alabama Baldwin   84.7     8.8     0.1   1            1.4          3.9
 3 Alabama Barbour   83.8    10.9     0.4   1.8          1.5          1.6
 4 Alabama Bibb      83.2    13.5     0.5   0.6          1.5          0.7
 5 Alabama Blount    84.9    11.2     0.4   0.9          0.4          2.3
 6 Alabama Bullock   74.9    14.9     0.7   5            1.7          2.8
 7 Alabama Butler    84.5    12.4     0     0.8          0.6          1.7
 8 Alabama Calhoun   85.3     9.4     0.2   1.2          1.2          2.7
 9 Alabama Chambers  85.1    11.9     0.2   0.3          0.4          2.1
10 Alabama Cherokee  83.9    12.1     0.2   0.6          0.7          2.5
# … with 3,128 more rows
```

Select and arrange

```
counties %>%
  select(state, county, drive:work_at_home) %>%
  arrange(drive)
```

```
# A tibble: 3,138 x 8
   state    county                     drive carpool transit  walk other_transp work_at_home
   <chr>    <chr>                      <dbl>   <dbl>   <dbl> <dbl>        <dbl>        <dbl>
 1 New York New York                     6.1     1.9    59.2  20.7          5.4          6.8
 2 Alaska   Northwest Arctic Borough    16.5    10.4     0.4  46.9         21.2          4.6
 3 Alaska   Aleutians East Borough      18.4     4.9     0.5  71.2          2.2          2.8
 4 New York Kings                       18.6     4.4    61.7   8.8          2.5          3.9
 5 Alaska   North Slope Borough         20.1    17       2.8  37.9          7.9         14.3
 6 Alaska   Lake and Peninsula Borough  21.2     6.8     1.1  36.2         32.4          2.4
 7 New York Bronx                       22.5     4.7    59.7   8            1.8          3.3
 8 Alaska   Nome Census Area            25.8    10       0.3  36.9         22.7          4.3
 9 Alaska   Bethel Census Area          26.5    12.7     0.5  33           22.6          4.8
10 Alaska   Yukon-Koyukuk Census Area   28.7     8.1     0.2  38.1         20.1          4.9
# … with 3,128 more rows
```

Contains

```
counties %>%
  select(state, county, contains("work"))
```

```
# A tibble: 3,138 x 6
   state   county   work_at_home private_work public_work family_work
   <chr>   <chr>           <dbl>        <dbl>       <dbl>       <dbl>
 1 Alabama Autauga           1.8         73.6        20.9         0  
 2 Alabama Baldwin           3.9         81.5        12.3         0.4
 3 Alabama Barbour           1.6         71.8        20.8         0.1
 4 Alabama Bibb              0.7         76.8        16.1         0.4
 5 Alabama Blount            2.3         82          13.5         0.4
 6 Alabama Bullock           2.8         79.5        15.1         0  
 7 Alabama Butler            1.7         77.4        16.2         0.2
 8 Alabama Calhoun           2.7         74.1        20.8         0.1
 9 Alabama Chambers          2.1         85.1        12.1         0  
10 Alabama Cherokee          2.5         73.1        18.5         0.5
# … with 3,128 more rows
```

Starts with

```
counties %>%
  select(state, county, starts_with("income"))
```

```
# A tibble: 3,138 x 6
   state   county   income income_err income_per_cap income_per_cap_err
   <chr>   <chr>     <dbl>      <dbl>          <dbl>              <dbl>
 1 Alabama Autauga   51281       2391          24974               1080
 2 Alabama Baldwin   50254       1263          27317                711
 3 Alabama Barbour   32964       2973          16824                798
 4 Alabama Bibb      38678       3995          18431               1618
 5 Alabama Blount    45813       3141          20532                708
 6 Alabama Bullock   31938       5884          17580               2055
 7 Alabama Butler    32229       1793          18390                714
 8 Alabama Calhoun   41703        925          21374                489
 9 Alabama Chambers  34177       2949          21071               1366
10 Alabama Cherokee  36296       1710          21811               1556
# … with 3,128 more rows
```

Other helpers

- `contains()`
- `starts_with()`
- `ends_with()`
- `last_col()`

For more:

```
?select_helpers
```

Removing a variable

```
counties %>%
  select(-census_id)
```

```
# A tibble: 3,138 x 39
   state county region metro population   men women hispanic white black native asian pacific citizens income
   <chr> <chr>  <chr>  <chr>      <dbl> <dbl> <dbl>    <dbl> <dbl> <dbl>  <dbl> <dbl>   <dbl>    <dbl>  <dbl>
 1 Alab… Autau… South  Metro      55221 26745 28476      2.6  75.8  18.5    0.4   1         0    40725  51281
 2 Alab… Baldw… South  Metro     195121 95314 99807      4.5  83.1   9.5    0.6   0.7       0   147695  50254
 3 Alab… Barbo… South  Nonm…      26932 14497 12435      4.6  46.2  46.7    0.2   0.4       0    20714  32964
 4 Alab… Bibb   South  Metro      22604 12073 10531      2.2  74.5  21.4    0.4   0.1       0    17495  38678
 5 Alab… Blount South  Metro      57710 28512 29198      8.6  87.9   1.5    0.3   0.1       0    42345  45813
 6 Alab… Bullo… South  Nonm…      10678  5660  5018      4.4  22.2  70.7    1.2   0.2       0     8057  31938
 7 Alab… Butler South  Nonm…      20354  9502 10852      1.2  53.3  43.8    0.1   0.4       0    15581  32229
 8 Alab… Calho… South  Metro     116648 56274 60374      3.5  73    20.3    0.2   0.9       0    88612  41703
 9 Alab… Chamb… South  Nonm…      34079 16258 17821      0.4  57.3  40.3    0.2   0.8       0    26462  34177
10 Alab… Chero… South  Nonm…      26008 12975 13033      1.5  91.7   4.8    0.6   0.3       0    20600  36296
# … with 3,128 more rows, and 24 more variables: income_err <dbl>, income_per_cap <dbl>,
#   income_per_cap_err <dbl>, poverty <dbl>, child_poverty <dbl>, professional <dbl>, service <dbl>,
#   office <dbl>, construction <dbl>, production <dbl>, drive <dbl>, carpool <dbl>, transit <dbl>, walk <dbl>,
#   other_transp <dbl>, work_at_home <dbl>, mean_commute <dbl>, employed <dbl>, private_work <dbl>,
#   public_work <dbl>, self_employed <dbl>, family_work <dbl>, unemployment <dbl>, land_area <dbl>
```

Let's practice!

DATA MANIPULATION WITH DPLYR

The rename verb

DATA MANIPULATION WITH DPLYR

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Data Scientist

Select columns

```
counties_selected <- counties %>%
  select(state, county, population, unemployment)

counties_selected
```

```
# A tibble: 3,138 x 4
   state   county   population unemployment
   <chr>   <chr>         <dbl>        <dbl>
 1 Alabama Autauga       55221          7.6
 2 Alabama Baldwin      195121          7.5
 3 Alabama Barbour       26932         17.6
 4 Alabama Bibb          22604          8.3
 5 Alabama Blount        57710          7.7
 6 Alabama Bullock       10678         18
 7 Alabama Butler        20354         10.9
 8 Alabama Calhoun      116648         12.3
 9 Alabama Chambers      34079          8.9
10 Alabama Cherokee      26008          7.9
# … with 3,128 more rows
```

Rename a column

```
counties_selected %>%
  rename(unemployment_rate = unemployment)
```

```
# A tibble: 3,138 x 4
   state   county   population unemployment_rate
   <chr>   <chr>         <dbl>             <dbl>
 1 Alabama Autauga       55221               7.6
 2 Alabama Baldwin      195121               7.5
 3 Alabama Barbour       26932              17.6
 4 Alabama Bibb          22604               8.3
 5 Alabama Blount        57710               7.7
 6 Alabama Bullock       10678              18  
 7 Alabama Butler        20354              10.9
 8 Alabama Calhoun      116648              12.3
 9 Alabama Chambers      34079               8.9
10 Alabama Cherokee      26008               7.9
# … with 3,128 more rows
```

Combine verbs

```r
counties_selected %>%
  select(state, county, population, unemployment_rate = unemployment)
```

```
# A tibble: 3,138 x 4
   state   county   population unemployment_rate
   <chr>   <chr>         <dbl>             <dbl>
 1 Alabama Autauga       55221               7.6
 2 Alabama Baldwin      195121               7.5
 3 Alabama Barbour       26932              17.6
 4 Alabama Bibb          22604               8.3
 5 Alabama Blount        57710               7.7
 6 Alabama Bullock       10678              18
 7 Alabama Butler        20354              10.9
 8 Alabama Calhoun      116648              12.3
 9 Alabama Chambers      34079               8.9
10 Alabama Cherokee      26008               7.9
# … with 3,128 more rows
```

Compare verbs

Select

```
counties %>%
  select(state, county, population, unemployment_rate = unemployment)
```

Rename

```
counties %>%
  select(state, county, population, unemployment) %>%
  rename(unemployment_rate = unemployment)
```

Let's practice!

DATA MANIPULATION WITH DPLYR

The transmute verb

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Data Scientist

Transmute

- Combination: select & mutate
- Returns a subset of columns that are transformed and changed

Select and calculate

```
counties %>%
  transmute(state, county, fraction_men = men / population)
```

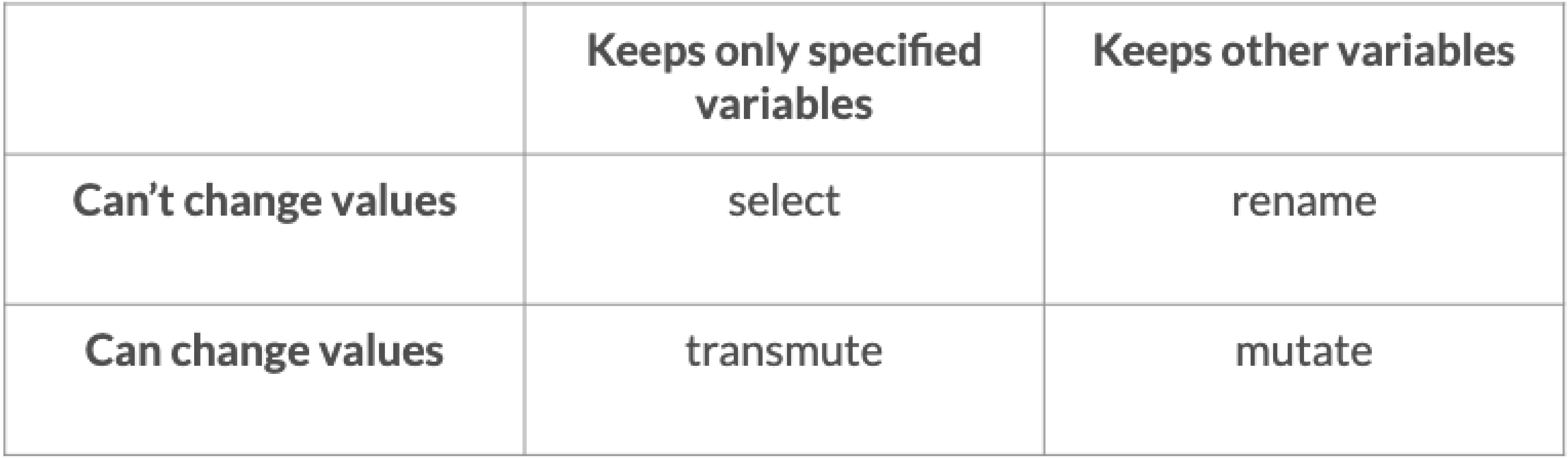
```
# A tibble: 3,138 x 3
   state   county   fraction_men
   <chr>   <chr>           <dbl>
 1 Alabama Autauga         0.484
 2 Alabama Baldwin         0.488
 3 Alabama Barbour         0.538
 4 Alabama Bibb            0.534
 5 Alabama Blount          0.494
 6 Alabama Bullock         0.530
 7 Alabama Butler          0.467
 8 Alabama Calhoun         0.482
 9 Alabama Chambers        0.477
10 Alabama Cherokee        0.499
# … with 3,128 more rows
```

Select and calculate

```
counties %>%
  transmute(state, county, population, unemployed_people = population * unemployment / 100)
```

```
# A tibble: 3,138 x 4
   state   county   population unemployed_people
   <chr>   <chr>         <dbl>             <dbl>
 1 Alabama Autauga       55221             4197.
 2 Alabama Baldwin      195121            14634.
 3 Alabama Barbour       26932             4740.
 4 Alabama Bibb          22604             1876.
 5 Alabama Blount        57710             4444.
 6 Alabama Bullock       10678             1922.
 7 Alabama Butler        20354             2219.
 8 Alabama Calhoun      116648            14348.
 9 Alabama Chambers      34079             3033.
10 Alabama Cherokee      26008             2055.
# … with 3,128 more rows
```

Summary

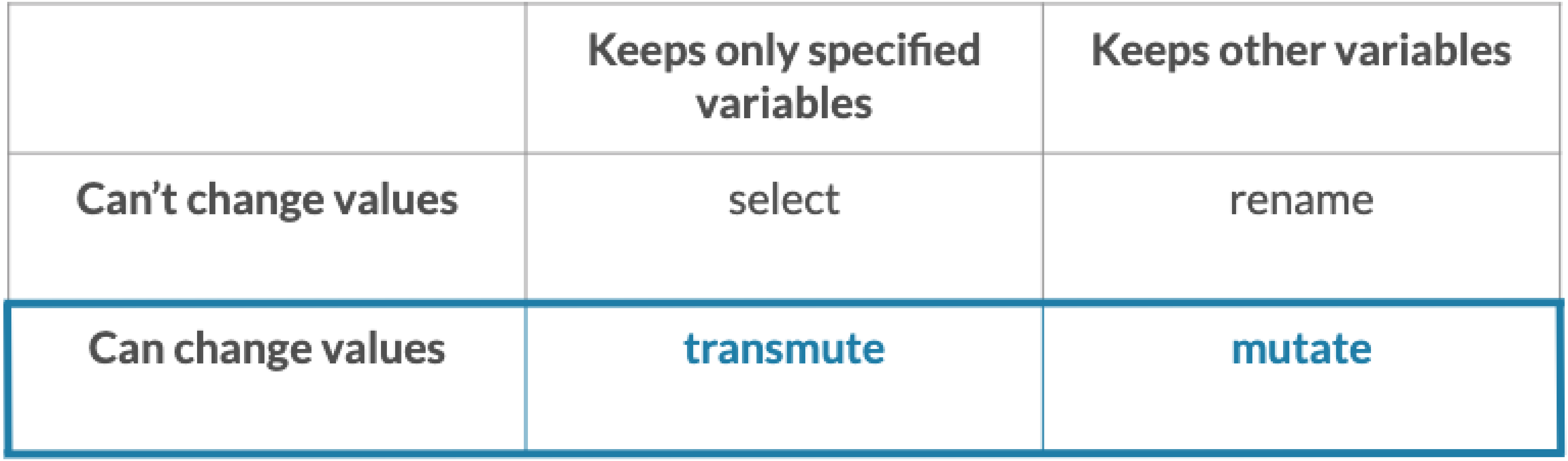


	Keeps only specified variables	Keeps other variables
Can't change values	select	rename
Can change values	transmute	mutate

Summary

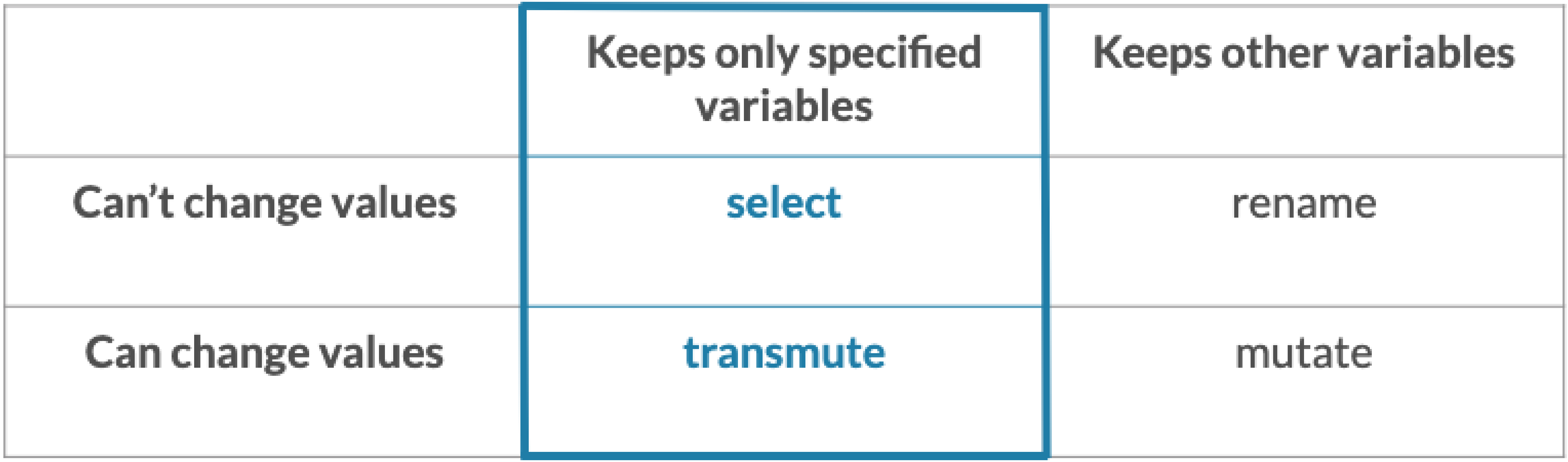
	Keeps only specified variables	Keeps other variables
Can't change values	select	rename
Can change values	transmute	mutate

Summary



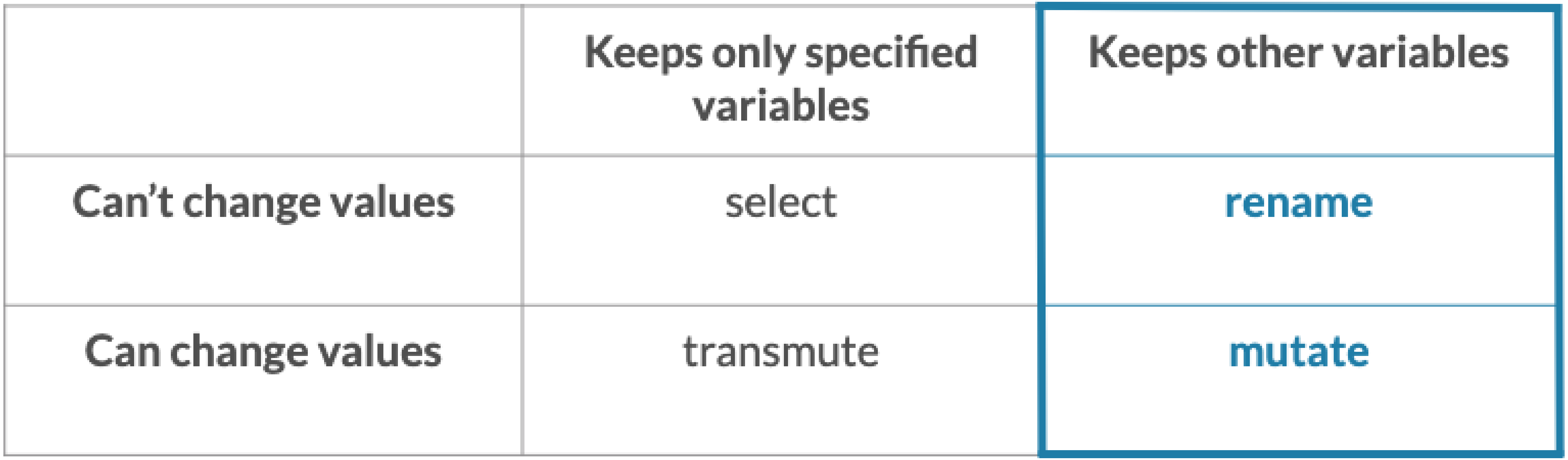
	Keeps only specified variables	Keeps other variables
Can't change values	select	rename
Can change values	**transmute**	**mutate**

Summary



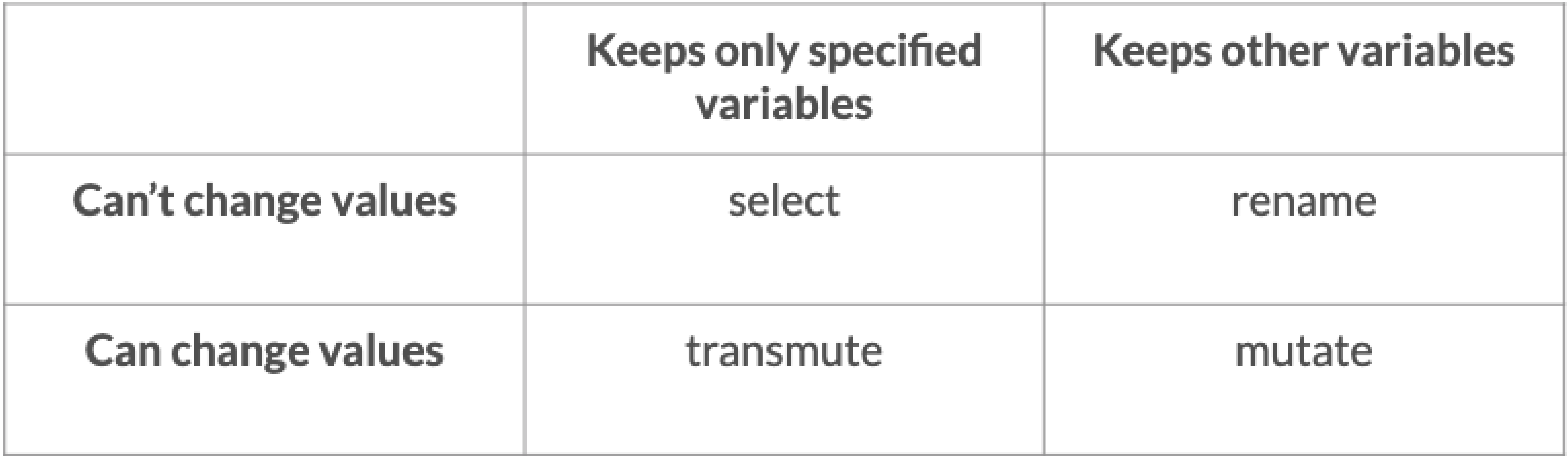
	Keeps only specified variables	Keeps other variables
Can't change values	select	rename
Can change values	transmute	mutate

Summary



	Keeps only specified variables	Keeps other variables
Can't change values	select	**rename**
Can change values	transmute	**mutate**

Summary



	Keeps only specified variables	Keeps other variables
Can't change values	select	rename
Can change values	transmute	mutate

Let's practice!

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