

Gross and fine manipulation

The Occupational Requirements Survey (ORS) provides information about the physical demands for civilian workers in the U.S. economy. The job requirements reflect those necessary for workers to perform critical tasks in support of the critical job functions, and not the capabilities of individual workers. Gross and fine manipulation are part of the physical demands published by the ORS program. Where possible, the ORS program provides whether one or both hands are necessary to perform gross and fine manipulation as well as the duration associated with each job requirement by occupation.

Gross manipulation is defined as seizing, holding, grasping, turning, or otherwise working with hand(s). This includes instances when fingers are used as an extension of the hand to hold or operate a tool. Some examples of gross manipulation include:

- teachers using a board eraser;
- goalies turning a hockey stick;
- welders using tin snips;
- truck drivers operating a steering wheel and gear shift;
- artists drawing (whether with a stylus, pencil, or some other device).

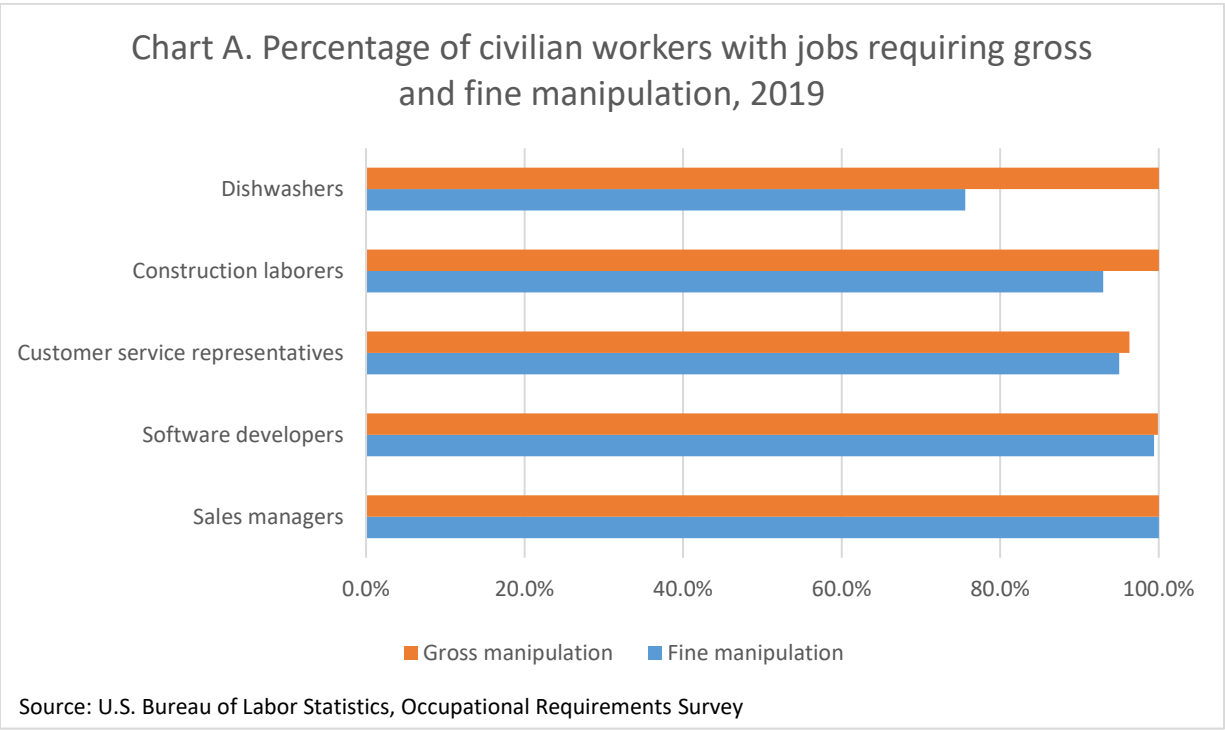
Fine manipulation is defined as picking, pinching, touching or otherwise working primarily with fingers rather than the whole hand or arm. The ORS program considers the job requirement of entering data on traditional keyboards or 10-key pads as a keyboarding requirement, as this is excluded from fine manipulation. Some examples of fine manipulation include:

- musicians playing a piano keyboard;
- bartenders entering a drink order into a touch screen point-of-service system;
- cashiers using a register with a hybrid keyboard;
- dental hygienists using tools to scrape tartar off of a patient's teeth;
- scientists using a pipette to dispense a solution;
- electricians using small tools to rewire a lamp.

There are many situations where multiple physical demands are performed concurrently. The ORS program captures these requirements separately. Some examples of both requirements being present include:

- receptionists making a phone call may include gross manipulation (holding the receiver with one hand) and fine manipulation (dialing the phone with the other hand);
- cashiers ringing up customers may include gross manipulation (moving product off conveyer belt) and fine manipulation (returning change and receipt);
- warehouse clerks may have to lift boxes off a conveyer belt (gross manipulation), and then enter the serial number from the box using a touchscreen scanner (fine manipulation).

In 2019, gross manipulation was required for 99.9 percent of all civilian workers and fine manipulation was required for 98.4 percent of all civilian workers. Some examples of detailed occupations with these requirements are included in Chart A.



The requirements of gross and fine manipulation are also provided based on whether the job requires workers to perform these physical demands using one hand or both hands. Gross manipulation is required for 99.9 percent of civilian workers, where 8.9 percent are required to use one hand and 91.0 percent are required to use both hands.

Fine manipulation is required for 98.4 percent of workers with 34.1 percent required to use one hand and 64.3 percent required to use both hands.

Generally, the sum of performing gross and fine manipulation with one hand and both hands will equal the overall requirement. For instance, the percentage of workers required to perform gross manipulation with one hand plus the percentage of workers required to perform gross manipulation with both hands should total the overall gross manipulation requirement for that job. Sometimes the total does not equal the overall requirement due to rounding or because one or both estimates are not available.

Table 1. Percent of workers by physical demand by occupation, 2019

Occupation	Gross manipulation			Fine manipulation		
	Required	One hand	Both hands	Required	One hand	Both hands
Software developers	99.9%	34.8%	65.2%	99.4%	56.7%	42.8%
Library technicians	100.0%	-	91.2%	100.0%	44.4%	55.6%
Emergency medical technicians	100.0%	-	100.0%	100.0%	-	68.1%
Elementary school teachers, except special education	100.0%	14.7%	85.3%	100.0%	54.5%	45.5%
Food preparation workers	100.0%	-	100.0%	99.2%	-	91.0%
Cashiers	100.0%	-	98.9%	100.0%	19.6%	80.4%
Tellers	100.0%	-	93.1%	100.0%	-	76.1%
Maids and housekeeping cleaners	100.0%	-	100.0%	91.1%	20.4%	70.7%

Note: Dash indicates no workers in this category or data did not meet publication criteria.

Source: U.S. Bureau of Labor Statistics, Occupational Requirements Survey

Duration estimates

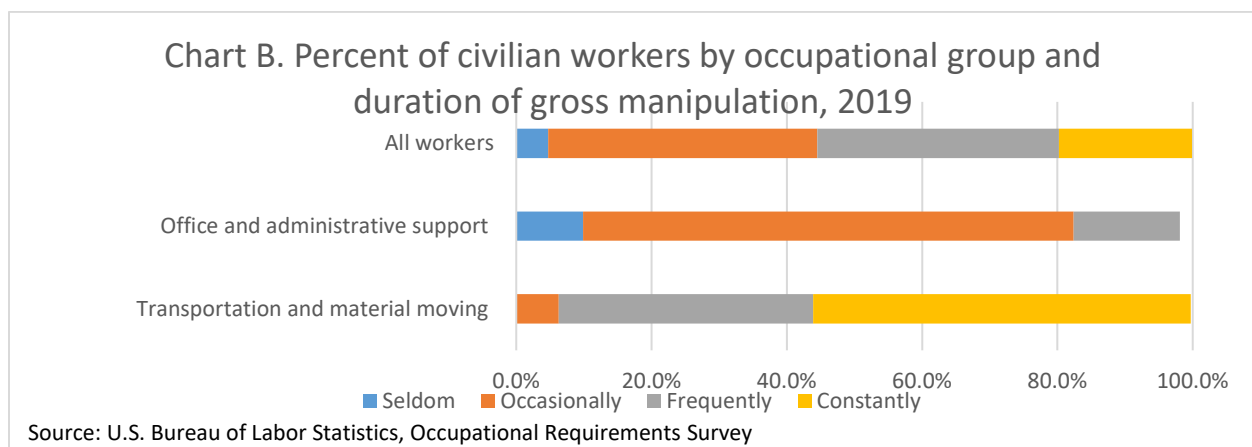
Gross and fine manipulation duration estimates are categorized by portion of the workday spent performing these physical demands. For example, if over the course of an 8 hour workday (480 minutes) workers lift boxes for less than 5 minutes, gross manipulation would be classified as “seldom,” assuming no other gross manipulation is performed. However, if they lifted boxes for 1 hour each work day, then gross manipulation occurs “occasionally.” See Table 2.

Duration	Amount of work day
Seldom	Up to 2 percent of the workday
Occasionally	2 percent up to 1/3 of the workday
Frequently	1/3 up to 2/3 of the workday
Constantly	2/3 or more of the workday

Source: U.S. Bureau of Labor Statistics, Occupational Requirements Survey

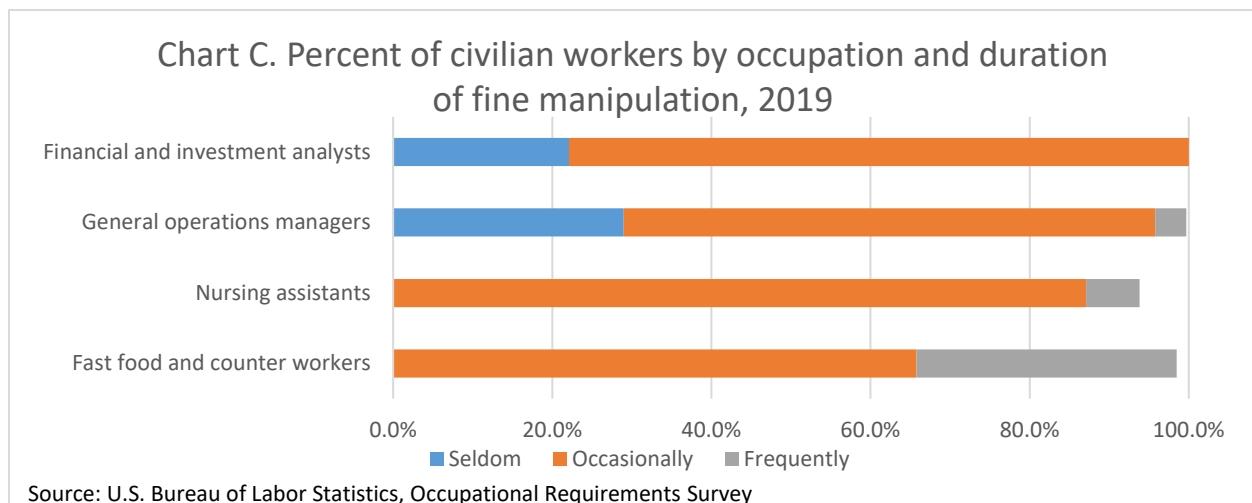
Duration: Gross manipulation

The duration of gross manipulation varies amongst civilian workers. 4.7 percent seldom perform gross manipulation, 39.8 percent occasionally, 35.7 percent frequently, and 19.7 percent constantly. See Chart B.



Duration: Fine manipulation

Similarly, the duration of fine manipulation varies amongst occupations. See Chart C.



Generally the sum of the duration estimates will sum to the overall requirement (gross and fine manipulation). Additionally, the sum of the duration estimates and the not present estimate generally sum to 100 percent. When this is not the case it is either due to rounding or because one or more estimates are not available.

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- All [The Economics Daily](#) (TED) articles on ORS
- [A look at teachers' job requirements, employer costs, and benefits \(PDF\)](#)
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For additional information on occupational requirements see the [ORS homepage](#) or download the [ORS complete dataset](#) to explore the latest estimates.